it wasn't that hard to do

I went from eating 3000 calories a day to 2000 calories and dropped about a pound a week for about 40 weeks.

While I was trying to lose weight, I started looking at my city, looking at its culture and infrastructure, trying to figure out why our city had an obesity problem.

And I came to one conclusion: we've built a tremendous quality of life, if you were a car.

(Laughter) But if you're human, obviously you're fighting cars all the time.

our town is very big

Oklahoma City has excellent highways that crisscross it, and no traffic jams to speak of.

That's why we all live so far away

Our town is huge, 620 square miles, but 15 miles is less than 15 minutes.

In Oklahoma City, you can still get a speeding ticket during rush hour.

As a result, people tend to scatter outward.

land is cheap

And we haven't asked land developers for a long, long time to build sidewalks on newly developed land.

That's improved, but that was the case until recently, when our data shows that more than 100,000 homes are in areas that are virtually unwalkable.

So when I took all of these factors into consideration, I decided that the first thing we should do is have a conversation.

As you can see, in Oklahoma City, we weren't talking about obesity.

So on New Year's Eve 2007, I went to the zoo and stood in front of an elephant and said, "This town is going on a diet to lose a million pounds."

yeah it was a mess

(Laughter) The national media were immediately drawn to this story and reported it in one of two ways.

The media could have said, "This town was so fat that the mayor had to go on a diet."

Fortunately, the common consensus is, "Look, this is a ubiquitous problem.

This town is trying to do something about it."

People helped us out and brought a lot of people to the website.

Its web address is now thiscityisgoingonadiet.com

I appeared on "The Ellen DeGeneres" one weekday morning to talk about coaching weight loss, and my website was visited by 150,000 people that day.

Everyone joined in, and ('I'm trying to lose weight) I started to put on weight, and a conversation started that I thought was very important.

At home, fathers and mothers started talking to their children about obesity.

Now spoken in church

The church has started creating its own running group and support group for people dealing with obesity.

All of a sudden it's a hot topic at school, at work

Big companies generally have great wellness programs, but mid-size companies generally overlook these issues. And those companies started using our programs, and they started using their employees as models and running contests to see who could face obesity and take the initiative to help others.

And finally the problem came to the next stage

It was time to push forward with what I called MAPS3.

MAPS3, like the other two programs, had an economic development motivation behind it, but it added health infrastructure to the economic development process, not just a traditional economic development project like building a new convention center.

We built a new 70-acre Central Park in downtown Oklahoma City.

For those who choose to live in the city center, we're building streetcars downtown and increasing the density of the city center to make it possible for people to walk.

Others We're building health centers for older people in communities.

Investing in the river that was originally invested in the original MAPS, it is now in the final stages of development to become the world's most suitable venue for sports like canoeing, kayaking and rowing.

Last spring we hosted the Olympic trials.

There are plans in the city center to bring an Olympic-scale event to Oklahoma City, to relocate athletes from around the world, and to get kids more familiar with these new types of hobby activities.

We're also building hundreds of miles of new sidewalks across the metro area, another initiative that was once adopted.

And we're also looking back and working on the situation in the inner city where we built communities and we built schools, but we didn't connect the two.

We've built libraries, we've built communities, but we've never been able to connect them on foot.

Yet another source of funding is redesigning inner-city streets to be more pedestrian-friendly.

The street was so wide that I had to press a button to walk across and run to cross in time.

But now, we're designing narrower streets, looking at them from above, making them more pedestrian-friendly, really redesigning them, rethinking how we build infrastructure, designing cities for people, not cars.

A master plan for the cycle path is also being completed.

It will be over 100 miles when completed

So within Oklahoma City, the culture is beginning to shift.

So what do you think, and with that comes an exciting demographic shift.

Well-educated 20-somethings are moving to Oklahoma City from other parts of the world, really far from California.

In January of 2012, we lost a million pounds. I went to New York with some of the people who lost 100 pounds and changed their lives.

Then I went to the lobby of Men's Fitness magazine, yes, the magazine that put us on that list five years ago.

I was sitting in the lobby waiting to speak to a reporter when I noticed the latest issue of the magazine was on the table, and I picked it up and saw the headline, "America's Fattest City: Do You Live There?"

Yeah, I know, I used to live there.

(Applause) And then I looked at the list of the leanest cities, and it was there.

Ranked 22nd in the US

State health statistics are also getting better.

Still a long way to go

Health is still not something we can boast about in Oklahoma City, but we're shifting to a culture that makes health a priority.

And I'm very happy that well-educated young people in their 20s are moving to Oklahoma City, and that many people are choosing Oklahoma City.

Oklahomaty has the lowest unemployment rate in the United States and probably the strongest economy in the United States.

If you're my age, at some point during your education, you were told to read a book called "The Grapes of Wrath."

Many Oklahomans left for California in search of a better future.

People are coming to us from the west, and if you look at the demographic trends, what you're seeing right now is 'the wrath of the grapes'.

(Laughter) (Applause) Grandchildren are coming home.

You are great listeners and listened very intently.

Thank you very much for inviting me

(applause)

Today I'm going to show you how to play one of my favorite games, massive multiplayer finger wrestling.

As far as I know, there's no other game like this, and you can experience 10 different positive emotions in 60 seconds just by playing this game.

It's true, by playing this game with me for just one minute today, you can experience joy, relaxation, love, wonder, pride, curiosity, excitement, wonder, satisfaction, creativity, all in one minute.

Isn't it amazing? you want to try

I'd like to ask a few people to help me explain this game.

In the meantime, let me introduce you to this game, which was invented 10 years ago by the Austrian collective of artists called Monochrome.

thank you monochrome

Now, you all know the ancient finger wrestling between two people.

Sunny let's do it

1, 2, 3, 4 We signal the start and fight, of course Sunny wins because she's strong

Massively Multiplayer Finger Wrestling The first thing you need to know is that we are a generation of gamers.

There are billion gamers on the planet and they need more challenges.

So the first thing is to add more thumbs.

Eric here

Three thumbs together, including Peter.

You can do it with four thumbs, and the winner is the first to hold someone's thumb down.

This is the important point.

you can't use it

who did it Eric

In this case, Eric wins because he's the first to grab my finger.

That's the first rule. It's typical to fight with three or four thumbs, but if you want more of a challenge, don't hold back.

Please challenge

Another example

There's only one more rule you need to know: the gamer generation loves a challenge.

I just noticed, folks, you have unused thumbs.

Connect more

If it's just four people, you can do finger wrestling with both thumbs at the same time, just like this.

wonderful

If you have a lot of people, reach out and connect with a lot of people instead of huddling together in a group.

I would like to do that from now on

All the thumbs in this room -- I think there's like 1,500 of them -- I'm going to put them together.

We have to connect the first floor and the second floor of the audience, so please reach down if you're upstairs and up if you're downstairs.

Now -- (Laughter) -- before I begin -- that's good, everyone, you're on -- before I begin, I'd like to ask you to slide a little bit.

This is beginner level

But there is also a difficult assembly

This is called a "death star model."

For Star Wars lovers

This is "Mobius strip"

It's for science geeks

This is the highest level, and it's supposed to be amazing.

We're standard, so let's do it. I'm going to give you 30 seconds here, so connect all your thumbs.

Connect and network in 30 seconds

Everyone stand up, it'll be easier that way

Come on, stand up!

Stand up!

well that's good

I haven't played finger sumo yet

If you have an extra thumb, please wave your hand.

Last thumb check

If you have an extra thumb, please wave your hand.

Grab that thumb!

good for the back

Do you have any others?

Then count to three and let's start

Look carefully and hold

May I? 1, 2, 3 left!

(laughs) Did you win? wonderful!

(Applause) Well done. Thank you.

Now-

While you're basking in the satisfaction of winning your first big, multiplayer finger wrestling match, let's briefly review the positive emotions.

First is curiosity.

Hearing "Large-scale multiplayer simultaneous finger sumo wrestling"

"What's that?" you might be thinking

It piqued my curiosity

And "creativity," you used your ingenuity to connect all your thumbs together.

Raise your hand or raise it

I got creative, that's great.

What about "surprise"? You'd be amazed at how it felt to wrestle with both thumbs at the same time.

And the room erupts with cheers

You were also "excited." When you started playing finger wrestling, you really tried to win, and you got really excited.

I also "relaxed" because I was able to stand up

Because I was sitting all the time, my body would have been able to relax and stretch.

There was also "joy." Everyone smiled and the room was filled with joy.

There was also a sense of “satisfaction”

No one was bored fiddling with their phone while playing this game.

And the three most important emotions, 'wow', we all connected body to body for a minute.

Have you ever had a physical connection with all the TED attendees?

it's really amazing

When it comes to body connection, there's this wonderful hormone called oxytocin, and when you release it, you feel connected.

The quickest way to release oxytocin is to hold someone's hand for six seconds.

You've been holding it for more than six seconds, so biochemically, it wouldn't be strange for you to feel "love" for each other.

The last emotion is "pride"

Some people are like me, please be honest

Who lost both fingers?

I was unlucky

But I just learned something new

Learn a game you didn't know at all from scratch

I am now able to teach others

so congratulations

So who won only one side?

good news to all

According to the official rules of massive multiplayer finger wrestling According to the official rules of massive multiplayer finger wrestling you will be given the title of Grandmaster

Because the game hasn't spread to the world yet, these titles have to be moved up, even faster than chess.

Congrats to all grandmasters

The one who wins only one thumb is the Grandmaster.

Has anyone won both?

That's excellent

I need to update my Twitter and Facebook status

According to the official rules, you are a "Legendary Grandmaster." Congratulations.

I'll finish by giving you one tip for the next match.

To become a "Legendary Grandmaster", you must complete both matches at the same time.

Aim for the weakest

There are people who are not concentrating and seem weak.

Focus on one side and move the other arm like this.

If one wins, stop arm movement

Everyone panics, so I'll go there all at once.

Then you're a legendary grandmaster.

Thank you for introducing me to your favorite game.

Woo! (Applause) Thank you. (Applause)

(Applause) I'm going to talk about user-generated content.

Through three stories, we will consider how user-generated content can be connected to business.

First, the first story

In 1906, this man, John Philip Sousa, went to the US Capitol to give a talk about a technology called the "gramophone."

Sousa didn't like this machine

he couldn't help but say

"The gramophone will ruin the artistic development of this country's music.

When I was a child, on summer nights young people used to gather in front of the houses and sing popular and old songs.

Now this damn machine rings day and night

We're going to lose our vocal cords."

He says the vocal cords will be lost in the process of evolution, just as humans evolved from monkeys and lost their tails.

Have a look at this

It says "Culture"

Culture, to use the terminology of modern computer science, is a kind of "literacy culture."

It's a place where people participate in the creation and re-creation of their own culture, and in that sense it's literate.

What Sousa feared was that we would lose that ability because of what they call the "fucking machine."

And instead of that, a "read-only culture," which is the opposite of the "read-and-write culture," will emerge.

A culture in which creativity is consumed, but the consumer does not participate in the creation.

It's a top-down, owned culture where people's vocal cords are gone.

Looking back at the 20th century, we have to admit that Sousa was right, at least in what we call the "developed world."

Never in human history has the creation of culture been so professionalized and held in the hands of a few.

People's creativity has never been so effectively robbed by that damn machine.

The twentieth century, at least in the regions we know best, has transformed culture from literate to read-only.

Moving on, land is a kind of property, a property protected by law.

As Lord Blackstone once said, land is protected by trespassing laws, and ever since trespassing laws were in place, they were thought to protect land from deep underground to far above.

It was a system that worked very well for most of the history of land control.

In 1945, the Supreme Court had the opportunity to address the issue

Two poultry farmers, Thomas Lee and Tinny Cosby, were very dissatisfied with planes.

Because their chicken would fly off after the plane and crash into the barn wall, even though the plane would fly away.

So they complained to Lord Blackstone that the plane was trespassing.

Since time immemorial, the law has decreed that you cannot fly over land without the landlord's permission, so you must stop flying.

The Supreme Court considered this century-old tradition and ruled against Cosby and others, as seen in Justice Douglas's opinion.

The Supreme Court has said that the principle of defending land all the way to heaven cannot be applied in the modern world, otherwise all transcontinental flights would have to follow suit and airlines would be saddled with countless lawsuits.

The idea of ​​common sense is seldom used in the legal world, but it was common sense.

One final story. Before the Internet came along, the last major threat to the content industry was this technology, the threat from broadcasting. Broadcasting was a new way to disseminate content.

At the time, a legitimate cartel held the rights to most of the music used on air, an organization called ASCAP.

They had exclusive licenses to most of the popular songs, and they used that right to show their power to the broadcasters.

Between 1931 and 1939, they raised their fees by 448 percent, and finally, the broadcasters cooperated and said they were fed up.

And in 1939, lawyer Sidney Kay started a company called Broadcast Music Company, now known as BMI.

BMI was much more democratic than ASCAP, and BMI was the first to include black music in its repertoire.

But most importantly, BMI took public domain works, adapted them, and made them available free of charge to its members.

ASCAP said fine then

I figured people would backlash, because the best music wasn't available because the stations were using the sub-optimal public domain productions provided by BMI.

But the people didn't fight back, and in 1941 ASCAP conceded defeat.

The point is that even though these stations were showing the second best, competition allowed them to break through the legal cartels against the use of music at the time.

I've told three stories, and this is where we get into the discussion.

In my opinion, the most important thing that the Internet has done is that it has created a catalyst for the revival of literacy, the culture that Sousa glorified.

Digital technology can help regenerate the vocal cords that Sousa spoke so passionately about to Congress.

User-generated content has become such an invaluable commodity in the business world that it's fueling amateur culture.

I'm not talking about an amateurish culture. I'm talking about a culture that people create not for money, but to enjoy what they do.

It's also the culture your children are creating all the time.

Sousa glorified young people singing popular songs and old songs together, but if we think about it, we should also recognize what children are doing now.

Taking popular songs or old songs and remixing them to create something else

Children are exposed to culture in this way.

Just a few examples, you'll get the idea of ​​what I'm talking about.

The first is what we call anime music videos, which are anime captured from television and re-edited with music tracks.

(music) Be confident Jesus will survive Don't worry

(Music: "I Will Survive" by Gloria Gaynor) (Laughter) And this is the best.

(music: Lionel Richie and Diana Ross "Endless Love")

i only have you

You're the only light that shines into me

first love you

you are my breath

It's all about the steps I take

I

i wanna share all my love with you

with no one else

if i look into your eyes

I know how much you're thinking of me

(music) This is the remix

(Applause) I have to stress that this is not what you would call "piracy."

I do not intend to justify selling or distributing other people's content without the copyright owner's permission.

I'm talking about people who use digital technology to take someone else's content and recreate it to give it another meaning.

The point is, it's not the techniques we've seen here.

Of course, all the techniques you just saw have been used by TV and film producers for the last 50 years.

The important thing is that these techniques have become the property of the common people.

Anyone with access to a $1,500 computer can now take sounds and images from the things around them and give them meaning.

A tool for creation became a tool for speaking

That's the literacy of today's young generation.

I think, as children grow in their understanding of digital technologies and learn how to interact with them, they will.

It cannot be said that the law welcomes the revival of literacy culture and treats it with common sense in response to this new use of culture that uses digital technology.

Instead, copyright law and the architecture of digital technology interact to create a view that all these acts are illegal.

Because if the core of copyright law is to regulate copying, then the inescapable fact is that any use of culture in the digital world will inevitably produce copies.

That's why all uses require permission.If you don't get permission, you're an infringer.

It becomes an infringer in the same way that airplanes were infringed in the past.

Common sense, however, has not yet rebelled against the legal response to these forms of creativity.

What we see instead is something much worse than the backlash.

Both sides of this debate are taking more extreme stances on the conflict between the law and the use of technology.

On one side, we're using new technology to automatically remove all content from sites like YouTube, including copyrighted material, without determining whether it's fair use or not.

And on the other hand, there's a growing abolitionist view of copyright among children -- a generation that denies the very role copyright should play, rejects copyright, and thinks that the law is nothing more than silly stuff to be challenged, ignored if given the chance.

We should have learned over and over again that extremism in one causes the other, and both extremism is wrong.

I want to say that it's all about balance, and as a good liberal, it's completely wrong to say that I look to the government first.

(Laughter) Let's start by looking at the courts and legislatures and what we can get them to do to make the system more sensible.

Part of the reason for the failure is that the courts are too passive and the legislature is corrupted. Corruption does not mean that change is stymied by bribery.

So we need something else, another solution

In my view, it's a private solution, a solution that aims to legalize the behavior of young people, a solution that realizes the economic potential of that behavior, and a solution that we see in the BMI story.

As BIM has shown, competition provides a kind of balance, and I wouldn't be surprised if the same thing happened today.

We don't have public domain to rely on right now, so we need two kinds of changes instead.

First, the support of artists and creators in making their work more freely available.

For example, they can say that their work is non-commercial, free for amateur use, but prohibited for commercial use.

And then, the businesses that make up the literacy culture need to explicitly endorse this literacy culture, so that an ecosystem of freer content, or freer content, can grow and coexist with each other in a neutral space, where freer content and less free content compete, and opportunities for creativity to grow in the competition can teach lessons from both sides.

I'd love to talk about such a plan that I know of, but I can't go against the TED rules about marketing, so let's not talk about it.

Instead, think about what the BMI case teaches us.

The choice of artists is critically important for any new technology that has a business opportunity.In order for these new technologies to seize the opportunity, they have to get the support of the artists.

But let me end by saying what I think is more important than that, much more than business.

It's how these discussions relate to our children.

We have to understand that children are different from us. This is us.

(Laughter) We made a miscellaneous tape, but they remix the music.

we watched tv but they make tv

Technology is what made our children different from our generation, and as we've seen what these technologies make possible, we need to know that the "creative instinct" that technology creates cannot be extinguished, it can only be criminalized.

We can't stop children from using technology

All you can do is make it an underground activity

we can't make our children passive again

All you can do is make them "pirates" Is that the right thing to do?

We live in a strange time, an age of prohibitions, so to speak. In many areas of our lives, we are constantly breaking the law.

Ordinary people live outlaw lives, and we do the same with our children.

Children live their lives knowing they are living in violation of the law

Knowing that is extremely dangerous and prone to corruption.

But in a democratic society, we should be able to do better.

Let's at least do something better for our children, even if it's not for business

thank you

(applause)

When we think of Nepal, we tend to think of the snow-capped Himalayas, the crystal clear, calm waters of alpine lakes, and the vast grasslands.

What some of you may not know is the foothills of the Himalayas, where the climate is very warm and the landscape is green all around, with a great diversity of wildlife, including one-horned rhinos, Asian elephants and Bengal tigers.

But unfortunately, these animals are under constant threat from poachers, who catch and kill animals for body parts.

Troops and forest guards are sent in large numbers to stop the killing of animals, but protecting Nepal's national parks is not easy, because soldiers patrol thousands of hectares of forest on foot or on the backs of elephants.

What's more dangerous for them is a shootout with poachers, which is why Nepal is always looking for new ways to help protect its forests and wildlife.

So recently, Nepal got a new tool to fight wildlife crime, which is a drone, or more precisely, a drone.

Over the past year, my colleagues and I have built drones for Nepal and trained park conservation workers to operate them.

Drones not only give us panoramic views from the sky, but they also allow us to capture high-definition images of what's on the ground in great detail.

For example, here are two rhinos bathing in the lowlands of Nepal on a hot summer day.

What we now believe is that drones have tremendous potential not only to combat wildlife crime, but also to monitor the health of wildlife.

what is a drone

The drone you're talking about is just a model airplane with an autopilot system that has a small computer, a GPS compass, a barometric altimeter, and a few other sensors.

These drones can be equipped with specialized equipment, such as a video camera or a photographic camera.

It also requires software, where the user programs the mission and directs the flight path to the drone.

What surprises many of you is that a maintenance drone consists of just four parts.

In fact, maintenance drones don't cost that much, they're cheaper than a regular laptop or a decent pair of binoculars.

So if you built your own maintenance drone, you'd probably want to fly it, but how do you fly a drone?

Actually, you don't fly it, the drone flies itself.

You just program the mission and tell the drone a flight path.

It's actually just clicking a point, using open source software to mark a waypoint on Google Maps.

The flight path can be as simple as a few points, or it can be longer and more complex, along rivers.It can be longer and more complex, along rivers.

Sometimes it takes a flight path like a lawnmower to take pictures of the area.The pictures it takes are used to map the woodland.The pictures it takes are used to map the woodland.

Some researchers would like to fly drones along forest boundaries to keep an eye on poachers and forest trespassers, to keep an eye on poachers and forest trespassers.

Once you've programmed any mission, you upload it to the autopilot system, take the drone outside, toss it up into the sky, and you're ready to fly.

A lot of our missions are taking pictures and videos, and once the shooting starts, we usually go get some coffee and sit back and relax for a while.

Most drones return and even land automatically.

So what can we do with drones?

When we first prototyped the drone, our main goal was to fly through the remote rainforests of northern Sumatra, Indonesia, and our main goal was to fly through the remoter rainforests of northern Sumatra, Indonesia, looking for the roosts of great apes known as orangutans.

The reason I wanted to do this was because I needed to know how many orangutans were left in this forest.

The traditional method of orangutan surveying is to walk into the forest with heavy equipment, and use binoculars to examine treetops that may be home to orangutans or their roosts.

As you can imagine, this is a very time-consuming, labor-intensive, and very expensive process, so we were hoping that drones could significantly reduce the cost of orangutan census in Indonesia and other parts of Southeast Asia.

The first time I captured an orangutan roost on camera, I was so excited.

This is the first orangutan roost imaged by a drone.

Since then, I've photographed dozens of roosts, which have been found all over Southeast Asia. Now, I'm working with computer scientists to develop an algorithm that can automatically count the dens from the millions of photos we've collected.

But nests aren't the only things drones can find, but nests aren't the only things drones can find.

Here's a wild orangutan happily eating in a palm tree. Drones flew overhead many times, but they didn't seem to care.

I've photographed other animals as well, including Gabon's buffalo, elephants, and turtle burrows.

But instead of just taking pictures of the animals themselves, we also take pictures of their habitats, because we want to understand the health of their habitats, because we want to understand the health of their habitats.

Sometimes I zoom out and see what's going on around me.

This is an oil palm plantation in Sumatra.

Today, oil palms are a major driver of deforestation in the region, so we thought we'd use this new drone technology to monitor the growing deforestation in Southeast Asia.

Drones could also provide context for illegal logging activities.

This is a recently cleared forest, also in Sumatra.

You can see the cut wood still lying on the ground.

The most exciting part of taking photos from the air is actually after this. We use special software to stitch the photos together to create a map of the entire landscape. This map provides us with very important information for monitoring land-use change: farms seem to be growing, forests are beginning to shrink, fires have started, and so on.

A 3D model of a forest can be created by processing aerial images.

3D models are not only beautiful to look at, but they're also very geometrically accurate, which means they allow researchers to measure tree spacing, calculate surface area, vegetation growth, and so on.

Recently, we've started experimenting with thermal imaging cameras.

What this camera can detect is any object that radiates heat from the ground, so it's very useful for spotting poachers and bonfires at night.

So far, I've talked about what security drones are, how you can fly them, and what they can do for you.

What I'm going to talk about is where in the world unmanned maintenance vehicles are being used.

The first prototype drone was built in Switzerland.

We took some of these to Indonesia and did a few test flights.

Since then, we've continued to build drones.

We've done a lot of collaborative research, and the most rewarding part is getting feedback on how we can improve our drones.

Drone development is never finished

Some of the areas we're continuously trying to improve are range, durability, and payload capacity.

Also, in joint research, we are discovering new uses for drones.

For example, camera traps are a common technique used by biologists to photograph shy animals that lurk in forests.

The problem with camera traps is that researchers have to go back and retrieve image data all the time, which is very time consuming, especially if you have dozens or hundreds of cameras.

But with drones, we can do this much more efficiently.

We're going to have a drone with a special sensor that allows it to fly over forests and remotely download images from a Wi-Fi enabled camera.

Transmitter collars are also commonly used by biologists.

These collars are now worn on animals.

Radio signals transmitted by the collars allow researchers to track the animal's movements across the field.

But traditional methods of animal tracking are so stupid because they require researchers to walk the ground and carry around a large, cumbersome antenna, which some researchers still carry around, though not as much as the TV antennas they used to mount on their roofs.

Drones can do the same job better Drones can do the same job better

So we put a scanning radio receiver in the drone and try to fly it over the canopy in a specific pattern, so that the user or operator can remotely triangulate the position of the transmitter-equipped animal without ever having to set foot in the forest.

The third, and probably the most exciting, way to use a drone is to fly in very remote areas. Flying drones into unexplored rainforests, buried in the tropics, and parachuting out tiny hidden microphones through which you can hear a variety of calls: mammals, birds, amphibians, yeti, sasquatch, bigfoot, whatever.

This allows us biologists to make predictions about what animals might be in these forests.

And the last thing I want to show you is the latest unmanned maintenance aircraft.

The unmanned maintenance aircraft MAJA has a wingspan of about 2 meters.

Weighs only two kilos, but can carry half its own weight

And it's a fully autonomous system.

As we work, we can send a live video stream to a computer at the ground station, meaning the user can see what the drone is seeing in real time.

It has a variety of sensors, and the resolution of the photos from these sensors is very high, one to two centimeters per pixel.

This drone is capable of continuous flight for 40 to 60 minutes and has a maximum flight range of 50 kilometers.

This is enough to satisfy our conservation use This is enough to satisfy our conservation use

The unmanned maintenance aircraft began with the crazy idea of ​​two biologists who were deeply passionate about this technology.It was the crazy idea of ​​two biologists who were deeply passionate about this technology.

And what we strongly believe is that drones will revolutionize conservation research and practical applications.

There were a lot of skeptics and naysayers who said they were just playing around with toy planes.

in a way they are right

Let's be honest, drones are a man's best toy.

But at the same time, I've also gained something because I've shared my vision with many wonderful colleagues and collaborators, and discovered the potential of unmanned maintenance vehicles.

It's clear to us that conservation biologists and conservationists must use every means at their disposal -- including drones -- to fight to save the last remaining forests and wildlife on this planet.

Thank you

(applause)

Five years ago, I took a research leave and went back to my alma mater, medical school, back to my alma mater, medical school.

So I put on my lab coat again and saw a patient for the first time in 17 years since I became a management consultant.

During the month I spent there, two things surprised me.

The first was that we were mostly talking about hospital budgets and cost cutting. And the second thing that I thought was a problem was that my colleagues -- my friends from medical school, the brightest, the most motivated, the most passionate people in their work -- the most passionate people in their work -- many of them had become cynical, discouraged, and had distanced themselves from running a hospital.

When I think about cutting costs, I ask myself, "Are we forgetting our patients?"

Your countries, and mine, have health care costs.

Medical expenses account for a large proportion of the national budget

We will try to curb that increase through various reforms.

In some countries, surgical patients suffer from long wait times.

In some countries, there is no insurance coverage for new drugs, and patients don't get them.

In other countries, doctors and nurses are viewed by governments as targets for cost containment.

Because the decisions that ultimately affect health care costs are made by doctors and nurses.

Because they choose expensive tests and decide to operate on old and frail patients.

So by restricting doctors' freedom of choice, they're trying to keep health care costs down.

As a result, today's doctors lament that they don't have enough authority to choose the treatments their patients need.

Friends have good reason to be unhappy Friends are good to be unhappy

BCG (Boston Consulting Group) took up this issue on the premise that this is not the way medical management should be.

And then we took another look at what we were supposed to achieve.

Our healthcare system is ultimately aimed at improving the health of our patients, and it must be delivered at a limited and affordable cost.

This is called value-based healthcare

The definition of value is this: the beneficial outcome for the patient is measured against the cost of the treatment.

This is very clearly presented in a 2006 book by Michael Porter and Elizabeth Taysberg.

This is my father-in-law, surrounded by three beautiful daughters.

In the study that we started at BCG, we decided to look at the quality of care rather than the cost.

When you compare hospitals, some hospitals have very high quality of care, while many others have very poor quality of care.

the difference was dramatic

My stepfather Eric has prostate cancer and will need surgery eventually.

I live in Europe, so I can go to Germany, which boasts a highly regarded healthcare system.

If you get treatment in a standard German hospital, you run the risk of suffering from the side effect of urinary incontinence, which has a 50% chance of putting you in a diaper.

Flip a coin and half 50% is a pretty good chance

If instead you go to a hospital in Hamburg called the Martini Clinic, your risk is reduced by a factor of 20.

1/2 and 1/20 1/2 and 1/20

It's a big difference

When you compare many hospitals for different diseases, you notice this huge difference.

But this is something you can't know without data

because the data doesn't really exist

no one should know

Going to the hospital is itself a gamble.

but there is hope

In the late '70s, a group of Swedish orthopedic surgeons met at an annual meeting to discuss various techniques used in hip surgery.

The slides on the left are various forms of metal instruments used in patients who need hip replacements.

I realized that they all had their own way of healing.

I claimed that my technique was the best, but I also knew that no one could know how true it was.

“In order to know and learn from the best medicine, we need to measure the quality of medicine.”

They spent two years debating, "What is the quality of hip replacement surgery?"

"You should measure this"

"No, you should measure that."

Once the data to be measured was determined, the measurement and sharing of the data began.

And we quickly discovered that if we put the cement in before we put the metal shaft into the patient's bone, it would be more durable, and most patients wouldn't need a second surgery.

The data was published and changed the way we treat in Sweden.

It was clear that this made sense

Every year since then the data has been published

Rankings are announced and you can see from top to bottom

Physicians began interacting to learn from each other, creating a cycle of continuous improvement.

Over the years, hip surgery in Sweden has been among the best in the world, at least in the institutions that measure it, but not many.

I think this system is very good

Physicians come together to agree on quality of care, measure quality of care, share data, and learn from those who provide the best care.

continuous improvement

this is exciting

that's not all

If you look at the cost side of this system, if you look at the cost side of this system, when you focus on the quality of care, it's the lowest cost, even if that's not your primary goal.

Coming back to hip surgery, a study done a few years ago showed that in the United States and Sweden,

Comparing the number of patients who needed repeat surgery seven years after the first surgery,

It turns out that three times as many patients in the US need revision surgery as in Sweden.

Considering the number of patients who underwent reoperation in the past seven years, how many unnecessary surgeries and unnecessary sufferings are

Imagine how much cost savings there would be for society as a whole.

We looked at the OECD data

The OECD, from time to time, uses existing data to compare the quality of health care across member countries.

In fact, the quality of health care in the United States was below the OECD average for a range of diseases, below the OECD average.

If the American health care system focused on measuring the quality of care, and brought it up to the OECD average, it would save $500 billion a year.

In fact, that's 20 percent of the total national health care budget.

These numbers seem to make a lot of sense, but you might be wondering if they're really achievable.

It's going to be a paradigm shift in medicine, it's not about whether it can be done, but it should be done.

Physicians and nurses are the actors that are transforming the healthcare system.

Every year, over 100 doctors and nurses and hospital staff and medical staff that I work with as a consultant, I meet hospital staff and medical staff.

We are all serious about the quality of care we provide to our patients.

Doctors - like everyone in the room - are very competitive.

they are always the best

—“Best in class”—

If someone points out that there's a better treatment than their method, they're going to do whatever it takes to improve their method.

And most of them just go unnoticed.

Another characteristic of doctors

They sometimes polish each other among doctors

If a cardiologist calls a competitor and discusses why the hospital is doing better, the other doctor will share the information with him.

share information to improve

This is how the quality of care is measured and made transparent, creating a cycle of continuous improvement, and here's a slide that shows it.

This is not just a good idea—

that's what's happening right now

We have created a large global community where we can measure the quality of care and compare outcomes.

Together with two academic societies, Michael Porter of Harvard Business School and the Karolinska Institute of Sweden, BCG established a research institute called ICHOM.

"Ichom" sounds like the sound of a sneeze, but the "International Consortium of

It is an abbreviation for 'Health Outcome Measurement' It is an abbreviation for 'Health Outcome Measurement'

We're bringing together top-notch doctors and patients to discuss disease by disease. What is the true quality of care? what should be measured? and make the standard international

Four working groups last year, four working groups last year, cataracts, back pain, coronary artery disease -- heart attacks, for example -- prostate cancer.

and we will publish the data in November this year

For the first time, we've made it possible to compare the same disease not only in Japan, but across multiple countries, and next year we'll be comparing eight diseases.

And in the next year, 16 diseases will be covered over the course of three years.

The goal is to cover 40% of all diseases Comparing the exact same diseases

Who and where is achieving better healthcare?

and it reveals why

Five months ago, I did a workshop at one of the largest university hospitals in Northern Europe.

The new CEO had a new vision to operate with an even greater focus on the quality of care: delivering meaningful care to patients.

On this day, we were in a workshop discussing childhood leukemia with doctors, nurses, and various hospital staff.

How do groups measure quality of care? How can we measure it more accurately than we do now?

how to treat children

What are the key improvements and what are the costs to patients?

We talked about whether there could be a more efficient treatment.

The venue was filled with enthusiasm

lots of ideas, full of enthusiasm

At the end of the meeting, the medical director suddenly stood up.

Looking over the group, he raised his fist like this, and said, "Thank you! Thank you!

Today we are finally able to discuss what this hospital should do."

By measuring the value of health care — measured not just in terms of cost, but in terms of meaningful care for patients — doctors, nurses and hospital staff will be seen not as part of the problem, but as an important part of the solution.

I believe that measuring the value of medicine will revolutionize medicine. Seeing this, the ancient Greek physician Hippocrates, often called the father of medicine, who always put the patient at the center of medicine, must be smiling in his grave.

thank you

(applause)

Technology has the power to change the way we think about nature.

For example, for the lion

For centuries, it was said that the females did all the hunting in the savannah, and the males only ate.

I'm sure you've all heard the story

I recently made an aerial map of Kruger National Park in South Africa.

A colleague attached a GPS-tracked collar to a lion and tracked its hunting behavior from the air.

In the bottom left you can see a lion stalking a herd of impalas, and to the right of that is what I call the lion's visibility range.

It shows how far a lion's field of vision can reach without vegetation.

This study shows that males are not as lazy as we thought. Males are not as lazy as we thought.

It's just that the way we hunt is different.

Females typically hunt extensively during the day in the open savannah, while males often ambush prey in dense bush at night.

This video is in the field of view during the actual hunt - the male is on the left and the female is on the right.

Red and dark colors are vegetated areas and white is wide open areas.

This is the exact height visibility of the hunting male and female.

You can suddenly feel the eerie tension of a male lion hunting — you can really feel it.

I tell you this story in the first place because I want to show you how ignorant we are about nature.

So far, many attempts have been made to stop the loss of rainforests, but as you can see in the red part of this diagram, the rainforests are disappearing rapidly.

It's ironic that despite all the efforts, places like this are so little scientifically known.

If you don't understand how can you protect

I'm a geoecologist and explorer, and I've studied physics, chemistry, biology, and many other boring subjects, but I'm obsessed with the unknown about the Earth, and I'm obsessed with the unknown about the Earth.

So we established the Carnegie Airborne Observatory (CAO).

It looks like a pretty painted plane, but it's loaded with more than a ton of advanced sensors and computers, and it's got an ambitious geoscientist and a pilot on board.

There are two very unique instruments, one is an imaging spectrometer that can measure the chemical composition of plants from above.

The other is a very high-powered laser that shoots out from the bottom of the vehicle and scans the ecosystem, making high-resolution 3D measurements almost half a million times a second.

Here's an image of the Golden Gate Bridge in San Francisco near my house.

You can fly right over this bridge and create a 3D color image in a matter of seconds.

But the real power of CAO is the ability to measure the actual composition of ecosystems, the ability to measure the actual composition of ecosystems.

This is a small town in the Amazon taken by CAO.

Like slicing the data, you can see, say, 3D vegetation and buildings, say, 3D vegetation and buildings, and you can use chemical information to actually measure the growth rate of plants while flying above.

Dark pink is where plants grow fastest.

You can see biodiversity in ways you never imagined before.

This is what the rainforest looks like in a hot air balloon.

And when you look at it, you can see that the rainforest is a kaleidoscope of different colors and different species coexisting.

Now, what I want you to know is that these trees are bigger than whales, so you can't understand them just by walking on the ground.

Our images are 3D, chemically and biologically analysable, so we can learn a lot about not only the species that live in the canopy, but also the species that live in the canopy, but also the other organisms that populate the rainforest.

We started CAO to understand things that we would never know from other perspectives, such as sensors on the ground or on satellites.

I would like to address three questions today.

The first question is, in tropical forests, how do we manage the carbon stock situation?

Trees in tropical forests store a lot of carbon, and that carbon needs to be kept in the forest to stop further global warming.

But unfortunately, the world's carbon emissions from deforestation include all ships, planes, trains and cars.

It's as much as the world's transportation system emits.

Politicians are working hard to create policies to curb deforestation, but those places are uncharted territory for science.

If you don't know where the carbon is stored, you can't know what you're losing.

For that, we need a sophisticated totalization system.

Our system allows us to get a very detailed picture of carbon stocks in tropical forests.

The red shows tropical forest with closed canopy, and the yellow and green are areas where the forest has been cut down in the shape of a cookie.

It's like cutting a cake, but it's as thick as a whale.

You can zoom in and see the forest, you can see the trees.

And the amazing thing is, even though you're flying all the way over the forest, when you analyze it later, you can feel the tops of the trees up close, and you can see every single branch and every leaf.

To use this technology to create the first high-resolution carbon topographic maps, we went to places as far away as the Amazon Basin, to places as far away as the Amazon Basin, to not-too-distant America, to Central America, to not-too-distant America and Central America.

Presenting the first carbon topographic maps of Peru and Panama Presenting the first carbon topographic maps of Peru and Panama

goes from red to blue

Red is where carbon stock is very high and trees are tallest, and blue is where carbon stock is very low.

In Peru alone, the results were astonishing, because the distribution of carbon was completely unknown until today.

In northern Peru, the Amazon River and the floodplain run through the red, particularly carbon-rich areas.

The fully deforested and destroyed forests are in blue, the fully deforested and destroyed forests are in blue, and the deforestation virus is spreading in orange.

Flying into the southern Andes, you can see the tree line, and as you go further into the mountains, you can clearly see the end of the carbon terrain.

If you go west of the Amazon, you'll see some of the largest swamps.

It's a dreamy wetland, and it reminds me of James Cameron's "Avatar."

If you go to Panama, one of the smallest tropical countries, you'll see that there's a lot of variability from red, which is high in carbon stock, to blue, which is low in carbon stock.

Unfortunately, the lowlands have lost most of the carbon, and what's left is the high carbon stocks, shown in red and green, found in the mountains.

One funny exception is in the middle of the screen One funny exception is in the middle of the screen

You can see the buffer zone around the Panama Canal.

It's red and yellow

Canal operators are committed to global trade as well as protection of canal watersheds.

Research like this has changed our policy on resource and forest conservation. It's changed our policy on resource and forest conservation.

Carbon topographic maps are evolving efforts to conserve forests and combat climate change Carbon topographic maps are evolving efforts to conserve forests and combat climate change

The next question is, how do we deal with climate change in places like the Amazon rainforest?

I spend a lot of time in places like this, so I'm already seeing climate change.

Temperatures are rising, droughts are increasing, and they're happening again and again.

The 2010 drought, shown here in red, was roughly the size of Western Europe.

The Amazon region was so dry in 2010 that even the main Amazon river was partially dried up, as you can see in the bottom right photo.

In remote and remote lands, droughts like this are wreaking havoc on tropical forests.

For example, you can see in red the trees that died after the 2010 drought.

This place, on the border of Peru and Brazil, is completely unexplored, completely unexplored, and almost completely unexplored by science.

As a geoscientist, I believe that when climate change occurs, living things will have to migrate from Brazil in the east to the Andes and mountains all the way to the west to avoid the effects of climate change as much as possible.

The problem here is that humans are destroying the western Amazon while we're doing this.

Look at these 100 square kilometers of scars in the forest made by gold miners.

The green part of the 3D image is the forest, and the effects of gold mining can be seen below the surface.

Now you can see at a glance that no living thing can move anywhere.

If you haven't been to the Amazon yet, you should go.

The Amazon surprises me every time I go

Maybe you'll see something like this

But when you're just looking at the river, you often don't know what's really going on in the forest.

I flew over this same river and took 3D images.

the forest is on the left

You can digitally remove the forest and see what it looks like under the canopy.

Here we've found an illegal gold mine away from the river bank We've found an illegal gold mine You can see that weird depression on the right side of the screen.

Don't worry, we're working with the public sector to address this issue, and we're addressing many other issues in the region.

We need to start creating a concrete and clear geographic plan to organize the conservation of the Western Amazon and the Andes-Amazon River Corridor, a unique and important corridor in this region.

But if the biodiversity in the area is completely unknown to science, then we can't plan.

So we're using CAO's laser-powered spectrometer to map the biodiversity of the Amazon rainforest for the first time.

We used real data to show different species in different colors.

Red and blue and green represent each species.

If you scale it up and map the entire region, you have a completely new map of biodiversity that has never been seen before.

And then we can see where the big changes in biodiversity are happening, and that's very important, because it gives us a good idea of ​​where organisms are moving from where to where as climate change changes.

It's also extremely vital information for policy makers to create protected areas in light of local development plans.

And the third and final question is how do we maintain the biodiversity of protected ecosystems on Earth.

The first example of lion hunting behavior that I talked about was a study within a South African reserve, within a reserve.

In reality, much of Africa's nature will be preserved within protected areas, shown in blue in this diagram.

This puts a lot of pressure and responsibility on the reserve management side.

We have to develop policies that equitably protect all the species of flora and fauna that we protect.

Policies can have a big impact

For example, about where and how much fire is used as a management tool.

Or how we treat elephants and other large animals, and if elephants overpopulate, it can have a negative impact on other animals and ecosystems.

These interrelationships really have a lot to do with the whole ecosystem.

The front is a lot of fire and a lot of elephants. The front is a lot of fire and a lot of elephants.

Beyond this line, you'll be in a fire-free, elephant-free area with lush vegetation and striking ecological differences.

In places like Kruger, elephant numbers are growing rapidly and becoming a big problem.

It's a delicate problem, not an easy one to solve.

But the technology that we've developed and that we've been using in South Africa can map, say, all the trees in the savannah, so after a few flights, we can see which trees have been knocked down by elephants.

For the first time, protected area managers will be able to develop sensitive and thoughtful management strategies, rather than the extreme policies I just showed you.

We think of reserves these days as places that maintain the natural balance of life. I think of them as places that maintain the natural balance of life, which means managing fires and elephants, but also managing their ecosystems and their impact on everything from insects to lions.

Eventually, I plan to expand the aerial observatory.

We want to launch airborne observatories into orbit around the Earth to survey the entire planet. We want to survey the entire planet.

Until then, I'll be flying around in remote areas that no one knows about.

One last thing I'd like to say is that technology is essential to managing the planet, but what's even more important is understanding how to use it and having the wisdom to apply it.

Thank you very much

(applause)

I'm Henry Evans from Los Altos, California.

(Applause) Hello.

I'm Henry Evans, and until August 29, 2002, I was living my version of the American Dream.

I grew up in a typical American town, St. Louis.

father is a lawyer

mother was a housewife

The six brothers and sisters were good kids, but they also had their fair share of trouble.

After high school, I decided to leave home and learn more about the world.

I went to the University of Notre Dame and graduated with degrees in Accounting and German, and during that time I spent a year in Austria.

Then I got my MBA from Stanford University.

I married my high school sweetheart, Jane.

I'm still happy to be with her

Together we raised four wonderful children

I worked hard, I worked hard, I worked hard, I made it through the ranks, and I worked my way up to become Chief Financial Officer in Silicon Valley, which I really loved.

I also bought my first home with my family. On December 13, 2001, I bought a beautiful corner of Los Altos, California, in need of repair, and I've lived there forever.

I was looking forward to the renovation, but eight months after moving into that house, I suffered a stroke-like seizure due to a birth defect.

Overnight, I lost the use of my arms and legs, and I lost my voice.I was 40 and in the prime of my life.

It took me many years, and with the strong support of my family, I was finally ready to live.

I fell in love with technology to help people with severe disabilities I fell in love with technology to help people with severe disabilities

Thanks to the motion-tracking devices that Madentech sells, I can move my cursor and use a normal computer with just the slightest movement of my head.

I can surf the web, I can email, and I regularly beat my friend Steve Cousins ​​at online word games.

Because of this technology, I feel socially connected, I feel active, I feel part of society.

One day, I was lying in bed watching CNN, and Professor Charlie Kemp, from the Medical Robotics Lab at Georgia Tech, was demonstrating the PR2 robot, and I was totally blown away.

I emailed Charlie and Steve Cousins ​​of Willow Garage, and we started the "Robots for Humanity" project.

I've spent about two years working on this project to make the PR2 robot a substitute for my body.

I was able to shave myself for the first time in 10 years.

From my home in California, I shaved Charlie's beard in Atlanta.

open the fridge yourself

I have become able to handle things around me

I discovered a once-unthinkable possibility: to live and contribute to myself and others in the same situation.

All humans are handicapped in some way

For example, if you're trying to move at 100 kilometers per hour, you'll both need an assistive device, which is a car.

Disability doesn't change your worth, and it doesn't change mine.

My car is cool, isn't it?

Last year, Kai-Jen Xiao from Willow Garage introduced me to Chad Jenkins.

Chad showed me how easy it is to buy and fly a drone.

And then I realized that I could use drones to expand the world for bedridden people, and by flying them, they could feel like they were moving on their own.

I can move my head and use my mouse to control my cursor, and I can use these web interfaces to see the video sent by the robot, and I can also send commands.

With a little practice, I got used to the interface and was able to drive around my house on my own.

You can walk around the garden and see how the grapes are growing.

I also checked the solar panels on the roof.

In addition, I had a head-mounted display called the Oculus Rift modified by Fighting Walrus to see if it could be used to immerse myself in the world of flying drones.

Chad's group at Brown University and I fly drones around his lab several times a week from our home, nearly 3,000 miles away.

Even though I'm a quadriplegic, I find time to study hard and play hard, and when I find time, I play fun games like robot soccer.

I wish I could pay my tuition. (Laughter) Henry Jokes aside, I'm sure everyone here would love to see you fly this drone from your home in California, 5,000 miles away.

(Applause) Henry, have you been to Washington DC recently?

(Laughter) It's great to be at TEDxMidAtlantic, isn't it?

(Laughter) (Applause) Tell me how you feel

(Laughter) Okay, we're done.

Show me your pilot skills

(Applause) It's going to take a little more tweaking, but it holds great promise.

What makes Henry's story so great is that he understands his needs, understanding what people in his situation want from technology, understanding what advanced technologies can do, and then combining them in intelligent and reliable ways.

We want to make robotics accessible so that everyone can be a part of it.

We offer robotics platforms at affordable prices, like the A.R. Drone for $300, Suitable Technologies' Beam for just $17,000, and open source robotics software that you can work with.

We want to give you these tools so that you can better move people with disabilities, care for the elderly, educate your children better, think about what the future of middle-class jobs will look like, monitor and protect the environment, and explore space.

henry please

thank you chad

Robotics has created a level playing field for all. I can also make people feel the joy of being human.

100 years ago, I would have been taken care of as a plant person.

but as a matter of fact

i think i was dead

Now it's all up to us. We can decide how we want to use robotics, for good or bad, to just replace humans, to make people better, or to make us do more and have more fun.

The goal of robotics is to unlock the power within all of us, to make me and others around the world like me more connected to the world.

With your help, we can make this dream a reality

thank you

(applause)

Today, one billion people around the world live in areas without roads that can be used year-round.

1 billion people

One in seven people on earth are seasonally isolated from their surroundings.

They can't deliver medicines when they need them, they can't get their daily necessities, they can't market their stuff, they can't get a steady income.

For example, in sub-Saharan Africa, 85% of roads become unusable during the rainy season.

Despite the investment, it's expected to take 50 years to catch up.It's expected to take 50 years to catch up.

In the United States alone, we have more than 640 million kilometers of roads, which are very expensive to build and to maintain.

Is there a better way to look at this situation? I thought Look at this situation Is there a good way? thought

Like mobile phones, which have developed dramatically in the last 10 years, can't we create a system that improves with the latest technology, like mobile phones, which have developed dramatically in the last 10 years? Can't we create a system that improves with the latest technology?

Many countries now have excellent communications without running copper wires.

Couldn't we do the same with transportation?

Consider this scenario

You're in a maternity ward in Mali, and your newborn needs medicine urgently.

How are you?

If you ask for medicine on your cell phone, someone will answer right away.

so far so good

But it takes days for the medicine to arrive, and poor transportation routes are the problem.

Poorly maintained transportation routes are the problem.

We think that if we fly an autonomous electric drone, we can deliver this medicine in a matter of hours. This is an autonomous electric vehicle.

Now you can carry a 2 kg load for about 10 km. Now you can carry a 2 kg load for about 10 km. It's just a small part of the network, but it could cover an entire country or even a continent.

A highly flexible automated logistics network

Substance transport network

Named "Matternet"

Utilizes 3 main technologies

The first is an autonomous electric flight vehicle.

The second is an automatic ground base, a base for a vehicle to change batteries during a long-distance flight, for a vehicle to change batteries during a long-distance flight, and for delivery and receipt of cargo.

The third is the control system that manages the entire network The third is the control system that manages the entire network.

Let's take a closer look at each technology

First, it's an unmanned aerial vehicle.

Ultimately, the aircraft will be used according to the weight of the luggage and the flight distance.

Now I'm using a small quadcopter.

Now you can carry a 2kg load 10km in about 15 minutes.

Force your way through bad roads in developing countries Compare your situation with traffic jams in developed countries Compare your situation with traffic jams in developed countries

fly autonomously

this is very important

The aircraft is equipped with GPS and various sensors and flies between ground bases.

The air vehicle is equipped with a device that automatically loads and unloads cargo and replaces batteries. The unmanned air vehicle flies between ground bases, lands and changes batteries automatically, and then takes off again.

Ground bases are set up in safe places Ground bases are set up in safe places

Ensures a safe environment for dangerous landings Ensures a safe environment for dangerous landings

Base awareness leads to flight paths, and base awareness leads to flight paths, which is very important in terms of the overall reliability of the network.

In addition to being a charging station, the base will become a center of commerce, as a delivery point for luggage.

Finally about the control system that manages the entire network Finally about the control system that manages the entire network

Based on the weather information observed from each base Based on the weather information observed from each base, not only can dangerous weather be avoided, but other risks can also be taken into account, making the most of the resources of the entire network to select the optimal flight path.

Let me show you how to fly here Let's show you how to fly here

Last summer I did my first field experiment in Haiti Last summer I did my first field experiment in Haiti

Delivering medicines to refugee camps set up after the 2010 earthquake.

everyone was very happy

Now let me show you the flying object Now let me show you the flying object

This is a $3000 flying vehicle

this price is going down

Can fly in severe weather conditions such as extreme heat, extreme cold, and strong winds Can fly in severe weather conditions

Imagine this package saves your life in Africa or in New York after a hurricane Imagine this package saves your life

How much do you think it will cost?

In fact, it costs just 24 cents to carry a 2-kilogram package 10 kilometers in this aircraft.

(Applause) It's unbelievable, but it takes only two cents of energy to fly. It takes only two cents of energy to fly.

When I first saw it, I thought it would have a tremendous impact on the world.

So how much would it cost to build a network anywhere in the world?

So I thought of a network to transport HIV samples in Lesotho, Africa. So I thought of a network to transport HIV samples in Lesotho, Africa.

So the question is how do you get the sample from the clinic where it was collected, and the question here is how do you get the sample from the clinic where it was collected to the hospital where it's analyzed.

Assuming sampling in an area of ​​140㎢ Assuming sampling in an area of ​​140㎢

About 1.5 times the size of Manhattan

We found that we could do it for less than a million dollars We found that we could do it for less than a million dollars

Compare it with normal infrastructure investment

A new paradigm makes this possible A new paradigm makes this possible

This is the internet inspired idea, this is the internet inspired idea of ​​a new transport network.

A decentralized peer-to-peer adaptive bi-directional network A decentralized peer-to-peer adaptive bi-directional network Plus low infrastructure investment and low environmental impact Plus low infrastructure investment and low environmental impact

It's a new paradigm, but there are other ways to use it.

Probably available elsewhere

Now let's take a look at the polar opposite: our city.

Half of the world's population lives in cities

500 million people live in big cities

We are experiencing rapid urbanization

China alone creates a city as big as New York every two years China alone creates a city as big as New York every two years

In big cities, even though they already have roads, they're very inefficient and congestion is a big problem.

It's very inefficient and congestion is a big problem.

So I think we need a new transportation network that exists between the roads and the Internet in these areas. I think we need a new transportation network.

Even if it works 24/7 like the internet, it works 24/7 like the internet, and the impact on the environment is low, the impact on the environment is low.

About two years ago when I started this initiative, about two years ago, when I started this initiative, a lot of people who came to see me said, "This is an interesting but crazy idea."

The story of drones is often shunned, and not just for Western societies, but also for many people in poor countries, especially those who will lose their jobs.

So why did we start?

It's not because it's easy to do, but it's because it's going to have great results.

Imagine a billion people can access substances like they get information on their mobile phones A billion people can access substances

Now imagine that the next big network that will be built around the world is a material transportation network.

I hope that better vaccines and medicines will be delivered to many people in developing countries. I hope that better vaccines and medicines will be delivered.

It will work against HIV, tuberculosis, other communicable diseases, etc. It will work against HIV, tuberculosis, other communicable diseases.

I hope that this will eventually lead to a new form of economic transactions that will save many people from poverty.

Developed and emerging countries want this new mode of transport to make cities more livable.

For those of you who still think it's just sci-fi, this is no longer a fantasy

However, in order to make it happen, we need to involve the real world.In order to make it happen, we need to involve the real world.

thank you

(applause)

I'd like to know how many of you are over 65 or would like to live past 65 -- if your parents or grandparents died at age 65 or are over 65 -- raise your hand.

I'm talking about aging in traditional societies.

I recently wrote a chapter on this topic in a book that compares traditional, small-scale tribal societies with modern, large-scale societies in a variety of ways, such as parenting and aging -- health and crisis management -- conflict resolution and religion -- and multilingual education.

For most of history, human societies were all tribal and far more diverse than the large societies we live in today.

All large societies have governments, inhabitants are mostly strangers, and inevitably become similar societies that are very different from tribal societies.

Tribal societies can be described as thousands of experiments in nature on how humans run their societies.

There may be something worthwhile for us to learn in experiments like this.

Tribal societies should not be looked down on as pathetic and primitive, nor should they be glorified as happy and peaceful societies.

When I study the customs of the tribes, I sometimes wonder if, while there are dreadful customs, there are also admirable and enviable customs that can be incorporated into our society.

In America, most older people are separated from their children and former friends, often in nursing homes, but in traditional societies, older people spend the rest of their lives with their children, relatives, and lifelong friends.

But even among traditional societies, older people are treated differently, ranging from far better than modern societies to far worse.

Extremely ill-treated societies exclude the elderly. There are four ways to do this: leaving the elderly alone, not feeding them until they die, not caring for them; leaving them behind when the group moves; driving them to suicide;

So in what kind of tribal society do children abandon or kill their parents?

There are two main conditions involved in this.

One is nomadic hunter-gatherer societies, which often move from one home to another, and when older people become immobile, they cannot carry them. Healthy young people have to carry their children and their belongings.

Another condition is when societies are in remote or unstable environments, such as in the Arctic or in desert regions, where food is cyclically scarce and food may not be enough for everyone to survive.

All available food should be reserved for healthy adults and children.

For us Americans, the thought of abandoning or killing a sick wife or husband, an old father or mother, is terrifying, but in such a traditional society there is no alternative.

they are facing an unavoidable grim situation

Older people have also eliminated their own parents, so they know it's their turn next.

On the other hand, happy societies that care about the elderly are the agrarian societies in New Guinea, where I've been doing field research for 50 years, and almost all the more sedentary traditional societies around the world.

In these societies, the elderly are cared for.

fed and respected

Older people continue to live in the same homes and neighborhoods with their children and relatives -- lifelong friends.

There are two main reasons why different societies treat older people differently.

What makes a difference is how useful older people are and what the society values.

First, the usefulness of older people is that they can engage in useful tasks.

Where the elderly in traditional societies are useful is if they can produce food.

And it's good for society when older people can look after their grandchildren, because they're the parents of their grandchildren, and their generation is free to hunt and forage for their grandchildren.

Another value of the elderly is the ability to craft tools, weapons, baskets, pots, and fabrics.

In fact, the best performers are often older people.

In traditional societies, the elderly are often the leaders and the most knowledgeable about politics, medicine, religion, song and dance.

Finally, older people in traditional societies play a very important role that we could never have imagined in our modern world of high literacy, where our sources of information are books and the Internet.

In contrast, in traditional non-literate societies, older people store information.

And the survival of society as a whole depends on their knowledge, when society is endangered by rare events experienced only by those who have lived a long time.

In traditional societies, older people can help in situations like this.

The extent to which we need older people determines how society treats them.

Another reason societies treat older people differently is their cultural values.

For example, in East Asia, there is a particular emphasis on respect for the elderly, and this is related to the Confucian teaching of filial piety — to obey, honor, and care for your aging parents.

Cultural values ​​that emphasize respect for older people are in contrast to the lower status of older people in the United States.

In America, the older you get, the worse your job prospects become.

hospitals are also disadvantaged

Hospitals in the United States have a clear policy of "allocation of health care resources based on age."

It's almost sinister, and what it means is that when medical resources are limited, say, when there's only one heart for transplant, or when a surgeon can only operate on a few patients, hospitals in the United States explicitly prioritize younger patients over older ones, because young people are more valuable to society, and even if young patients have less valuable life experience, they still have a future ahead of them.

There are several reasons why older people are underrepresented in America.

The first is the Protestant view of work, which places a high value on work, so that older people who are not working are not worthy of respect.

Another reason is that autonomy and independence are good for us Americans.

The third reason is that America worships youth, and this is reflected in advertising.

Advertisements for Coca-Cola and beer always feature smiling young people, even though older people drink like young people...

You've never seen an 85-year-old man smile in an advertisement for coke or beer.

In the United States, the only advertisements featuring gray-haired old people are nursing homes and pensions.

Now, what has caused the change in the status of the elderly today compared to traditional societies?

improved in some ways and worsened in many ways

The big improvements are that we're living significantly longer, that we're staying healthy in old age, and that we have more opportunities for entertainment.

Another area of ​​improvement is the availability of specialized aged care facilities and care programs.

On the other hand, the declining status of the elderly stems from the harsh reality of an unprecedented number of older people and fewer young people.

So the growing number of older people is putting a burden on the few young people, devaluing each old person.

And the worsening status of the elderly is the loss of social relationships that comes with age, because older people, their children, and their friends move and disperse many times in their lives.

Americans move on average once every five years.

So older people are living apart from their children and former friends.

What's worse is that older people's status has deteriorated because when they retire from work, they lose the relationships they have at work and the self-esteem that comes with work.

And perhaps the worst change is that modern seniors are becoming less useful than they were in traditional societies.

With more people literate, older people are no longer useful sources of information.

Now, if I need information, I look it up in a book, I google it.

In traditional societies, the pace of technological change is slow, so what you learn as a child is still useful when you're old, but in modern times, the pace of technological change is so rapid that what you learn as a child is useless 60 years later.

On the contrary, we older people are unable to use the technology we need in modern life.

For example, when I was 15 years old, I was very good at multiplication because I had memorized multiplication tables, I knew how to use logarithms, and I was very fast with a slide rule.

But now, those skills are of no use at all, because now any fool can use a calculator to do even eight-digit multiplication quickly and accurately.

On the other hand, at 75, I don't have the essential skills for everyday life.

In 1948, my family's first television set was easy to operate, with only three dials: power and volume -- channel switching.

But now, to watch TV at home, I'm at a loss because I have to use a remote control with 41 buttons.

I call my 25-year-old sons and ask them to teach me, and I wrestle with those damn 41 buttons.

How can we improve the lives of older people in America and capitalize on that value?

this is a conundrum

I'm going to use the remaining four minutes to make some suggestions.

One of the values ​​of the elderly, if they have the will, is that they can be good grandparents in caring for their grandchildren, because more and more women are entering the workforce, and fewer and fewer parents are staying at home all day -- caring for their children.

Instead, they're more popular — grandparents are better, more engaged, and more experienced than paid babysitters and daycares.

grandparents have experience raising children

Most of the time, they love their grandchildren and want to spend time with them.

Unlike other caregivers, grandparents don't quit, and raising another baby becomes a new, well-paid career for them.

The second value of older people, paradoxically, has to do with their lost value as a result of global change and technological innovation.

The reason older people are now -- they're more valuable -- is because they've experienced unique life situations, which are rare because of rapid change, but they can come back.

For example, what only Americans over the age of 70 today remember is the experience of surviving the Great Depression, the World Wars, and the agonizing over whether to drop the atomic bomb or not -- which would have the more dire consequences.

Few voters and politicians today have these experiences, but millions of older people do.

And such a terrible situation may happen again

Even if it doesn't happen, it's important to be prepared based on real-life experience.

Older people have that experience.

young people do not

The last value I want to mention is this: Older people can do more things, but they have more skills than younger people.

The social challenge is to harness the superior skills that older people have.

Of course, some abilities decline with age.

For example, physical fitness, stamina, ambition, or tasks that require new reasoning in limited circumstances diminish performance. For example, scientists under the age of 30 are better suited to work out the structure of DNA.

Conversely, some of the more valuable qualities that come with age include, besides experience, the ability to understand people and their relationships - the ability to reach out to others without the ego getting in the way - and interdisciplinary thinking based on large amounts of information.

Older people, therefore, are more effective than younger people at managing, managing, advising, and strategic planning — guidance, coordination, and long-term planning.

I've found this value in older people in my 60s, 90s, and many of my friends who are still investment directors, farm managers, lawyers, and doctors.

Many traditional societies make better use of their older people and provide them with a more fulfilling life than their older counterparts in modern large societies.

Today, the elderly are the most populous, healthiest and most well-served people in human history, but in some ways they're worse than ever before.

As many people will admit, life for the elderly in modern American society is a miserable situation.

We can learn more from the lives of older people in traditional societies.

On the other hand, if we can learn from the lives of older people in traditional societies, there must be a lot to learn from other aspects as well.

Of course, I'm not saying that we should abandon farming and metal tools and go back to a hunter-gatherer lifestyle.

Because there are many clearly happier parts of modern life than in smaller, traditional societies.

To name a few, they live longer, are much more materially prosperous, and suffer less from violence than in traditional societies.

But I think there's something wonderful about people living in traditional societies, and something to learn from them.

Traditional societies are materially poorer than we live, but socially much richer.

Their children are more confident, more independent and have better social skills than our children.

They see danger more realistically than we do.

Diabetes, heart disease, heart attacks, and other chronic diseases are rare, as opposed to almost everyone in this room dying from these diseases.

Our modern way of life makes us susceptible to such diseases, but our traditional way of life keeps us from getting sick.

These are some of the things we can learn from traditional societies.

I would appreciate it if you could feel the charm that I felt while living in a traditional society through this book.

thank you

(applause)

Yes, yesterday, I went out on the street in front of this building. Yes, yesterday, I went out on the street in front of this building, and I was walking on the sidewalk.

I was walking forward without saying anything

I was just moving

At that time, the movement of the person walking in front slowed down.

Yes, I was watching him move, but it slowed down and finally stopped.

The pace felt slow to me, so I gave him a little signal and walked past him, and saw what he was doing as he passed by.

I was typing. I couldn't walk while typing.

This event can be analyzed from a working memory perspective and from a multitasking perspective.

Today we are going to talk about the working memory area.

Now, working memory is part of the consciousness that we experience throughout the day.

you are doing it now

you can't just stop it

If it stops, it means you're in a coma, okay?

So I'm assuming you're all right now.

The working memory area has four basic functions

It stores memories and tidbits of knowledge about what happened in that moment.

We can also pull pieces of information from long-term memory as needed, mix them with what we know, and process them according to our purposes at the moment.

At that time, my goal wasn't to be president or to be the best surfer in the world.

Things that are more vulgar, like wanting cookies or how to get into a hotel room.

The ability of the working memory area is the ability to use that memory to recall knowledge, to remember things temporarily, and to use that temporary memory to achieve a goal at the moment.

Our understanding of the working memory area has a really long history, and high working memory capacity is positively correlated with other abilities.

People with good working memory are good at speaking.

They tend to try and be able to solve standardized tests, even if they're difficult.

Excellent writing ability

Good at analyzing things

let's try it here

Now I'm going to ask you to do some work.

Are you ready? Sounds good

say 5 words remember it

Don't write it down on paper, remember it

is five words

I'm going to ask you three questions while you remember.

what happens to the word

So the words are trees, highways, mirrors, Saturn and electrodes.

Are you okay for now?

So the next thing I'm going to ask you to do is answer the following calculation, what is 23 times 8?

say the answer out loud

(Muttering) (Laughter) As a matter of fact -- (Hmm) -- That's right (Laughter) Okay. Count 1 2 3 4 5 - 6 7 8 9 10 with your left hand.

This is a neurological test, in case you're wondering.

Okay, so next thing I'm going to ask you to do is say five things in order from the bottom of the alphabet.

you have to start with Z

(Laughter) Yes. So how many of you can confidently say those five words?

Okay Usually less than half of the people remember

5 people who can remember

someone who can remember 10

People who can only remember two or three things

Working memory is a really important human function.

And it's especially important here at TED, because you're exposed to so many different ideas.

The problem we face is this: the events of life are happening one after another before our eyes. We must seize the shapeless stream of experiences and derive some meaning from them through the capacity of working memory areas, the size of beans.

Don't get me wrong, the working memory area is amazing.

Working memory is able to analyze the current experience as it moves forward.

make sense of what is happening around us

There is also a limit

The working memory area enables communication with others

We can have conversations, we can have good storytelling skills, we can follow the flow of the conversation and know how to contribute to it.

Enables problem-solving and critical thinking

In the middle of a meeting, you can listen to someone's presentation, scrutinize it, decide if it's good, and you can ask questions later.

All this takes place in the working memory area.

You can go to the store and buy milk and eggs and cheese, even if what you really want is an energy drink and bacon.

The key problem with working memory is that it has limitations.

There are limits to memory capacity, memory time, and focus targets.

We can usually remember about four things on the spot

May I? It used to be said that there were seven, but magnetic resonance imaging (MRI) tests clearly show that there are only four.

Now, we can remember four things at once in about 10-20 seconds, so long as we don't try to do something with it, process it, apply it to something, or talk to someone else.

When we think about working memory, we have to understand that its limits affect us in many ways.

Have you ever moved from one room to another and forgot why you were here?

You know how to remember?

(Laughter) Have you ever forgotten your key?

Forgot your car?

Have you ever forgotten your child?

Have you ever wondered if you're in the middle of a conversation with someone and it's more interesting to hear someone else talking next to you? (Laughter) But you're trying to tell me it's not, because you're trying to say this.

Today's talk is about working memory, so there are things we can and can't do.

We have to recognize that working memory has its limits, and that our capacity for working memory is the ability to manage those limits.

Communicate well with strategy

So, I want to talk to you about some strategies, and this is very important, because in the next few days you'll find yourself in a flood of information to deal with.

First and foremost, we must process our very existence and our life experiences, immediately and in sequence.

You have to deal with the sequence of events as they happen, not 10 minutes later, not a week later, but immediately.

do you agree with what he says

What am I missing? what do you want to know

Do you agree with that assumption?

How can I apply this to my life?

This is how the immediate event is processed, and the results can be used later.

must be practiced repeatedly

let's think about it here

What I want to say to you again and again

Write down what you need to do, and when you get home, take it out, think about it, and take the time to practice it.

Although practice is sometimes negative for some reason

this is very helpful

The next point is the need to think concretely, think illustratively.

Often we have to associate new knowledge with old knowledge.

think in your head

It's about tapping into all that you have inside of you to take in new knowledge well, and it makes a lot of sense to take full advantage of these associations.

We also need to use images, and humans have the ability to work with images.

Why not take advantage of it

Let's visualize things and then draw them

After reading the book, let's use it as a subject for training.

I read through "The Great Gatsby," and I had the perfect idea in my head of what Gatsby would look like as an image of myself.

The final strategy I would like to share is organization and support.

Humans are machines that spin meaning

We try to make sense out of everything that happens in front of us.

Organized action helps, and it needs to be done in a meaningful way, in a constructive way.

If knowledge and experience are to be put into action, they must be used systematically.

Finally about support

Everyone is a beginner at the beginning

Everything we do approaches refinement

I expect it to get more sophisticated with time, it needs support

Support can be about asking questions of other people. Give them an org chart or a piece of paper with an image that helps them understand.

And finally, the main message I want to give you in terms of working memory capacity is that you can learn about what you process.

You can't be alive if you don't process the experience in front of you

live the experience thank you

(applause)

What's so special about the human brain?

We study animals, not the other way around. Why?

What is there in human brains that animal brains don't have?

When I got interested in this stuff 10 years ago, scientists assumed that all brains were made of the same stuff.

There was little evidence to support that, but what scientists thought was that all mammalian brains, including humans, are built in the same way, and that the number of neurons is proportional to the size of the brain.

What I mean by that is that if you have two brains of the same size, say, 400 grams, like this one, they would have about the same number of neurons.

If neurons are responsible for information processing, then if neurons are responsible for information processing, it's likely that these two brains have similar cognitive abilities.

One is a chimpanzee and the other is a cow.

Cows have a really rich mental life -- maybe they're smart, maybe they're just trying not to let us know, but we eat them, right?

I think most people would agree that chimpanzees are capable of much more complex, sophisticated and flexible behavior than cows.

This is the first contradiction, which is that the logic that "all brains are made the same" is incorrect.The logic that "all brains are made the same" is not correct.

but let's continue

If the brains are made the same way, and you compare animals with brains of different sizes, the bigger brains have more neurons -- they should have more neurons than the smaller brains -- and the bigger the brain, the more cognitively capable it is.

So the biggest brain should be the most cognitive.

But the bad news is that people's brains aren't the biggest.

it seems quite strange

Our brains weigh between 1.2 and 1.5 kilograms, but elephant brains weigh between 4 and 5 kilograms, and whales weigh up to 9 kilograms.

It must be really special, because it doesn't fit that rule.

They may be bigger, but we're better, because a good brain is big for its size, its cortex is much bigger, its cortex is much bigger.

And that extra cortex seems to be doing a lot more interesting things than just moving.

Because brain size is normal — it depends on body size.

The main reason we're told that our brains are too big for our body size is that we're comparing humans to apes, because we're comparing humans to apes.

A gorilla is two to three times the size of a human, so its brain should be larger than a human's, but the opposite is true.

The human brain is three times the size of a gorilla's brain.

Also special is the amount of energy that the human brain uses, and what's special is the amount of energy that the human brain uses.

Our brain weighs only 2% of our body weight, but it consumes 25% of the energy we need in a day.It consumes 25% of the energy we need in a day.

That's 500 calories out of 2,000, you use that much just to get your brain working.

The human brain is large for its size and consumes an astonishing amount of energy, which makes it special...

and this is where i started to worry

Biology seeks rules that apply to all living things Biology seeks rules that apply to all living things So why aren't the rules of evolution applicable only to humans?

There is a problem with the premise that all brains are made alike There is a problem with the premise that all brains are made alike

Brains of the same size may actually have different numbers of neurons Brains of the same size may actually have different numbers of neurons

Bigger brains don't necessarily have more neurons -- they may not have more neurons.

The human brain, regardless of its size, may actually have the highest number of neurons, and the human brain, regardless of size, may actually have the highest number of neurons, especially in the cerebral cortex.

For me, this led to an interesting and important question: How many neurons does the human brain have? How does it compare to other animals?

You've probably heard that the human brain has 100 billion neurons. You've probably heard that the human brain has 100 billion neurons.

no one knew

I searched the books for the source of the number, and I searched the books for the source of the number, and I couldn't find it.

It seems that no one has actually counted the number of neurons in the human brain.

So I came up with a way to count the cells in the brain, and basically I melted the brain and turned it into a soup.

It looks like this: you take a brain, or part of a brain, and mix it with a detergent to break up the cell membrane tissue, leaving the cell nuclei intact, so you get a suspension of free nuclei.

This contains the nuclei of the brain of a mouse This contains the nuclei of the brain of a mouse

Soup is great because it's soup, and you stir it to evenly distribute the nuclei in the solution. You take four or five drops of that uniform sample, look at it under a microscope, count the nuclei, and that's how many cells you have in your brain.

It's simple, it doesn't take long

We've counted neurons this way in dozens of different organisms, and what we've learned is that not all brains are created equal.

If you look at rodents and primates, in large rodents, the average diameter of the neurons themselves increases, and in large rodents, the average diameter of the neurons themselves increases, and the brain suddenly swells, and before the number of neurons increases, the brain grows much larger.

In primates, the average neurons don't get bigger, they grow in number.In primates, the average neurons don't get bigger, they grow in number.This is an efficient way to grow neurons.This is an efficient way to grow neurons.

So a primate brain has more neurons than a similarly sized rodent brain, so the bigger the brain, the bigger the difference.

what about our brains

We found that the average human brain has 86 billion neurons, and 16 billion of those neurons are in the cerebral cortex. Given that we don't match, I think this easily explains our amazing cognitive abilities.

It's almost as important as every neuron in your brain.

Now that we can mathematically describe the relationship between brain size and number of neurons, if the human brain were a rodent brain, what would it look like?

If a rodent has 86 billion neurons, its brain weighs 36 kilograms.

it can't be

The weight of that would crush the brain itself, and a body that would fit that brain would weigh 89 tons.

I can't say that I'm human

An important conclusion to draw from this is that we are not rodents.

The human brain is not just a larger rodent brain.

Compared to mice, we look special, but we shouldn't compare ourselves to mice, because the difference between humans and mice is obvious.

We are primates, comparison should be with other primates.

So if you do the math, a typical primate with 86 billion neurons, a typical primate with 86 billion neurons, would have a brain of about 1.2 kilograms.

so are you

So is Darwin

I hope Darwin really understands this.

His brain is similar to that of other primates, just like ours.

The human brain is certainly an amazing thing, but it's nothing special when it comes to neuron count.

Human brains are just big primate brains—

I think this idea is very humble and cool, and it reminds me of man's position in the natural world.

So why does our brain use so much energy?

We know how much energy the brains of humans and other animals use, and we already know how many neurons each brain has, so we can do the math.

As a result, the brains of humans and other animals have similar energy expenditures, consuming an average of 6 calories a day for 1 billion neurons.

The total energy used by the brain is a simple linear function of the number of neurons. It's a simple linear function of the number of neurons.

So the reason the human brain is spending so much energy -- just because we have a huge number of neurons -- is because we're primates -- we have more neurons for our body size than other animals -- more neurons for our body size than other animals -- so our energy usage is relatively high.

So the final question is, how did we get such a huge number of neurons? Especially if apes are bigger than humans, why don't they have bigger brains and more neurons?

When I realized that it was hard for the brain to keep many neurons, when I realized that it was hard for the brain to keep many neurons, I realized that there might be a simple reason.

Other primates don't have the energy to sustain both their large bodies and their large numbers of neurons.

so i calculated

First, we calculated the daily energy intake of a primate from a raw diet. On the other hand, we calculated the energy expenditure of a body of a given size, and the energy expenditure of a brain with a given number of neurons, to find a combination of how large a body and how many neurons an animal could sustain, given that the animal had a set time to eat per day.

What we've found is that neurons are high heat consumers, so there's a trade-off between body size and number of neurons.

An animal that eats eight hours a day can sustain up to 53 billion neurons, but its body is at most 25 kilograms.

Above that weight, you have to sacrifice neurons.

So either you have a large body or you have a large number of neurons, which means you either have a large body or you have a large number of neurons.

You can't have a big brain and a big body if you're eating like an ape.

One way to overcome this metabolic limit is to increase the amount of time you spend eating each day, but that's dangerous.

For example, if gorillas and orangutans wanted to have about 30 billion neurons, they would have to eat for eight and a half hours a day, and it's as if they could only eat.

Nine hours a day is probably the limit for primates.

What about us?

If you have 86 billion neurons -- if you weigh 60 to 70 kilograms -- you have to eat more than nine hours a day every day.

If we had eaten like apes, we wouldn't have evolved to where we are today.

how did you get here

If our brains need energy as calculated, and if we can't spend all of our time eating except when we sleep, then we have to get more energy from the same foods instead.

Amazingly, that's exactly what our ancestors figured out, 1.5 million years ago, when they figured out how to cook --

Using fire to cook — making the food itself more digestible.

Cooked food is softer, easier to chew, completely mushy in the mouth, more easily digestible -- easier to absorb into the body, and therefore more energy in less time.

So cooking gives us time to do more interesting things with our neurons, more time to do more interesting things with our neurons, so that we don't have to spend all day thinking about eating and looking for food -- we don't have to eat all day long.

So by cooking -- once a big neuron-filled brain was hard to maintain and a disadvantage, a big neuron-filled brain was once hard to maintain and disadvantageous, but now the brain is our main asset, because we have the energy and the time to maintain a lot of neurons, and we can do interesting things with those neurons.

I think this explains why evolution has evolved the human brain to grow so quickly, even though it's still the brain of a primate.

Cooking has made it possible for us to sustain such a large brain, starting with a raw diet, and culture -- farming, civilization, electrics, refrigerators -- and giving us the total energy we need for the day -- all at once -- at our favorite fast food joints -- all within our reach.

So what used to be a solution becomes a problem, and ironically, we're looking for the solution in fresh produce.

What are the benefits of being human?

We have— what do other animals not?

My answer is that the human brain has the highest number of neurons in the cerebral cortex.

What do humans do that other animals don't? I think that's what makes the human brain so big, and why the cerebral cortex has more neurons than anywhere else.

it's cooking

No other animal cooks, only humans.

I think we are who we are today thanks to that.

Studying the human brain changed my thinking about food.

When I look at my kitchen, I bow my head and thank my ancestors for the food that made us human. I thank my ancestors for the food that made us human.

thank you very much

(applause)

(Applause) It's such an honor to be here tonight, and I'm so happy to hear all of you speak.

The song we're playing tonight is actually a world premiere.

I'm working on a new record, but I've never played these songs to anyone but this mic.

This is a song I wrote about what technology means, and it's a perfect song for today's get-together.

When I was in college, I remembered that it was a big job for me, who was blind, to do research assignments.

I had to go to the library to find the book I needed, footnotes and all that stuff.

now just search on google

i wish i was in college

What I want to convey with this song is what are we going to do with this advanced technology?

It's "All the Answers"

What's the weather like in Cincinnati? What time is it in Tokyo? who is the father of this child? Who the hell wants to know that? Why can't I forget you when I'm trying to reach my goal beyond that? Why do I have to move my fingers to the music my heart plays? I don't know, you don't have to know 'Cause I've got all the answers Anything you want to know is in my hands You don't have to know 'cause the answers are in my hands Let's search through the ages Listening to the sound of the ocean Oh how freedom is so free Who was the mayor of Chicago in 1964? Why did Shakespeare create Iago to tear apart such pure love? Why can I hear my heart so clearly in my dreams? Why am I so angry about the news I heard today? It doesn't matter if you don't know Come on, let's sing All the answers are in my hands I know all the answers Even if I don't understand, I know all the answers I'm skimming the tabloid news I'm drinking my cup of tea and thinking How can freedom be? In my living room From Baton Rouge to Saskatoon Freedom is coming to everyone I know all the answers 'cause it's all on my screen 'cause I've got all the books in here All the all-all-all-all answers are in my hands (Applause) Thank you.

Hugh! It's a miracle I didn't miss this song

I played in public for the first time

(Applause) I feel like I've managed to do it, despite my trepidation.

This next song was born from a dream - a childhood dream.

I wanted to use this song as the title of the album, but I ran into some problems.

One is that it is difficult to pronounce.

words I made

It's called "Tembellana"

This song is based on my childhood thoughts about invisible forces.

"Tembellaana" is the dream of running away from a fearful thought.

Now it's Temberellana

Singing to the Argentinian rhythm called carnibalito

A dream within a dream A world within a world The cry of a primitive heart Reverberates across nations Shaking images The sound of weapons of war and marching limousines Travels slowly across nations What she needs is a hand extended from the depths of her heart Temberelana hey Temberelana Extinction has begun Earth is a liberated grave The sound of the final explosion echoes across nations Fear you are my enemy Erase everything but yourself without a trace I can't see anything but what I want to see Let's make a toast before I lose my sight To the color I love the most, the power of creation Temberellana Hey Temberellana Da Da Da Da Da Da Da Da Da Da Da Da Da Da Da Da Da Da Da Da Da Da Da Da Da Da Da Da Da Da Da Da Da Da Da Da Da Temberellana, Temberellana, Temberellana, Temberellana, Temberellana, Temberellana, Temberellana, Temberellana♪ Temberellana Hey Temberellana (Applause)

You all know something about me, and it's very personal.

We know something about every person we meet anywhere in the world, every person we pass on the street, we know what drives them, no matter what they're doing or what they're struggling with.

It's something we all have - the desire to be happy.

it's all the same

No matter how we think about happiness, we all share the desire to be happy.

Today's theme is gratitude.

What is the relationship between happiness and gratitude?

Many people will say, "That's easy."

"People give thanks when they are happy"

But think again

Is it true that happy people are grateful?

We all know that there are many people who have everything to be happy and are not happy because they want something else or more.

We also know people who have a lot of bad luck that no one ever wants, but who are genuinely happy.

they are happy and amazed

I wonder why? because they are grateful

Happiness does not bring gratitude

gratitude makes us happy

If you think happiness brings gratitude, think again.

gratitude makes us happy

So what exactly is gratitude?

how does it happen

look back

Everyone should know from experience

Everyone has a valuable experience for themselves

a very valuable experience

said to be given

It's a great combination

valuable and at the same time

It must be a true gift, not bought, not won.

I didn't get it through trading or hard work

it's a gift given to you

When these two things come together, when I realize that it's something that's really precious to me, and that it's given to me for free, a feeling of gratitude naturally wells up in my heart, a feeling of happiness naturally wells up in my heart.

Gratitude happens like this

The important thing here is that experiences like this don't have to be rare.

Gratitude doesn't have to be just an experience.

You should be able to live with a feeling of gratitude

that's what it means to live with gratitude

So how do we live with gratitude?

It is to experience and be conscious that each moment is given.

It's a gift. I didn't win it.

your power is not at work there

There's no guarantee that we'll have that moment again, but it's the most precious thing we've been given. This moment holds all the possibilities.

If we didn't have this moment, we would have no chance, we would never experience anything, and this moment is a gift.

It's a given moment

The gift hidden in this moment when it was bestowed-

It's an opportunity. It's the opportunity that's really appreciated, not the thing that's given to us. If that thing isn't somewhere else and you don't get the chance to enjoy it or do something with it, you can't be grateful.

Opportunity exists in every gift. There is a saying, "A missed opportunity never comes back."

think again

Each moment is a new gift that repeats itself over and over again. If you miss the opportunity of this moment, you will be given another moment, and another moment will come.

You can take advantage of this opportunity, or you can let it go.If you can take advantage of the opportunity, it is the key to happiness.

Grasp the master key to happiness

I can be grateful for what I have been given in every moment

So can we be thankful for anything?

That's impossible

We cannot appreciate violence, war, persecution and exploitation.

On a personal level, you can't be grateful for the loss of friends, betrayal, and bereavement.

I can't thank you all, but-

We can be grateful for the opportunities that are hidden in every given moment. Even if we are faced with a very difficult situation, we are able to rise to the challenge and respond to the opportunities that are given to us.

Surprisingly not bad

When you actually see it and experience it, you realize that most of the time, what you're given is an opportunity to enjoy it, and you miss it because you're rushing through life and you're not stopping and not recognizing the opportunity.

But sometimes there are big challenges, and when that happens, the challenge is to face those challenges.

For example, learning patience

They say the road to peace is more like a marathon than a sprint.

It takes patience and it's difficult

It could be standing up for your opinions and beliefs.

We are given that opportunity

You've been given the opportunity to learn, to persevere, to stand up.

They are the ones who make life meaningful

Even if you fail, you will be given another chance

there's always another chance

This is the wonderful and rich part of life

So what do we do with this splendor?

How can each of us find a way to live with gratitude? Not just once in a while, but in the moment.

How can I do it? It's very simple.

It's actually a simple thing that I was told when I was a kid, and you learned it when you crossed the street.

stop look forward

It just is the thing

But we never stop

we run through life and we don't stop

miss opportunities to not stop

you have to stop quiet your mind

We must put up a stop sign in our lives too.

A few years ago, I was in Africa, and after I came back, I started paying more attention to water.

In my part of Africa, there was no drinkable water.

Every time I turned on the faucet my heart was full

every time you turn on

I felt very grateful and happy

But that feeling doesn't last long

So I put a sticker on the light switch and the faucet, so that every time I turned on the faucet, I was conscious of the water.

Everyone has their own way of doing it, whatever comes to mind

It doesn't matter which method suits you.

And when you stop, the next thing is to look

Open your eyes wide and see

Sharpen your ears and sharpen your sense of smell

Open all your senses and accept this wonderful abundance that has been given to you.

There is no end, enjoy what you have, that's life

So open your heart too. Open your heart to the opportunities that are given to you. Open your heart to opportunities to help others and make them happy.

When you open your mind to opportunity, it leads to action, and that's number three.

Stop, look and move on, in other words, move to action

What we can do is given to us at this moment

It's usually an opportunity to have fun, but sometimes it's a lot more difficult.

But whatever it is, if you take advantage of the opportunity, you can get away with it, because humans are creative.

And this little consciousness of "stop, look, move" is a seed that has the power to revolutionize the world.

Because we're in the midst of a mindset shift right now, and you'll be amazed by this change. I'm always amazed by how often I hear the words "gratitude" and "appreciation."

You can see it in various places: when you get on an airplane, you say "thank you." When you go to a restaurant, you say "thank you."

Oh yeah, even toilet paper has a name like "thank you." (Laughter)

Gratitude is on the rise because people are realizing the importance of gratitude and the impact it can have on the world.

This has the potential to change the world in a very important way, because if you have gratitude, you're not afraid, and if you're not afraid, you're not violent.

Gratitude inspires action -- not lack, but contentment -- and it encourages sharing.

If you have gratitude, you will enjoy people's differences, and you will respect everyone, and this is the power pyramid in the world.

We're going to change. It's not going to be equal, but it's going to be equally respected, and that's the point.

The future of the world will be networked, neither pyramidal nor inverted pyramidal.

The revolution I'm talking about is a non-violent revolution. It's a revolution that is so revolutionary that it completely changes the concept of revolution.

What we need is a network of small groups, small groups that know each other, interact with each other, and that's the world of gratitude.

The world of gratitude is the world of joyful people

Grateful people are joyful people The more joyful people there are The more joyful people the more joyful our world becomes

We run a network for a grateful way of life, and the network is growing rapidly.

I don't understand why it expanded

I called on people to light candles when they felt grateful.

15 million candles lit in 10 years

In 10 years, 15 million candles have been lit, and people are starting to realize that a world of gratitude is a world of happiness, and we all have the opportunity to make the world a happier place by simply stopping, looking, and going.

This is what I want. If you hear this story and feel even the slightest bit that you want to try it, do it.

thank you

(applause)

Today, I want to talk about social change, but it's not about new treatments and care, or new ways of interacting with children, it's about new business models for social change -- new ways of solving problems.

In the UK, 63% of short-term male prisoners reoffend within the first year of their release.

So what do you think the average number of crimes committed by these ex-convicts is?

43 times

How many times have you been in prison?

7 times

We went to the Department of Justice and asked, what is the value of reducing recidivism?

should be of some value

You're spending money to run a prison, to use the police, to use the court process, to deal with repeat offenders, so how much is that worth?

Of course, we care deeply about social values.

An organization that I helped launch called Social Finance also focuses on social issues.

But we also wanted to talk about the economics, because if you can show the economics, the value of doing this is irreversible.

If we can agree on the value of reducing recidivism and the metrics by which we measure success, we can do something very interesting, very interesting things.

Called “Social Impact Bonds”—

The idea is that if we can get an agreement with the government, we'll sign a contract and work on a performance fee basis.

So governments can try new things, but they don't have to worry about failing and paying for it, and not being embarrassed, because that's a big problem for many government agencies.

Now, as you're all aware, there's one problem here, and it's that it takes a long time to verify that we're getting the expected results.

So we need to raise funds

Based on this contract, we will raise funds from social contribution type investors.

Don't you think there is an interesting way of thinking about being a socially responsible investor?

In fact, there are many people who, given the opportunity, would be willing to invest in something that would benefit society.

So I took the opportunity

Would you like to help the government find better ways to spend money? Instead of leaving people after they've finished their sentences and waiting for them to reoffend and then throwing them back into prison, we can actually deal with them and help them find a different path, resulting in less crime and fewer victims.

We find investors, and they pay for what we do, and if it's successful, we get good results, and by reducing recidivism, the government spends less, and we pay for the results with the savings.

Investors not only get a return on their investment, they get a return on investment.

In March 2010, we signed the world's first social impact bond with the Department of Justice at Peterborough Prison.

They took 3,000 prisoners and divided them into three groups of 1,000.

Each group will be followed for two years after release.

If you reoffend within a year, the court process will take six months. And then we're going to look at the results of that study. We're going to look at all the police data from all over the UK and compare it to groups that are as similar as possible.

So you get paid for the crimes you prevent.

If all three groups cut 10 percent, if all three groups cut 10 percent, the investor would get a return of 7.5 percent per annum. If they did better than that, they could get a return of up to 13 percent per annum, which is not bad.

Everyone wins in this scheme

The Department of Justice should try new programs, and only pay for them if they succeed.

Investors have two opportunities. First, they can invest in social change.

And you get a reasonable return on investment, as investors are well aware that the first to invest in these things is to have a strong conviction.

It's limited to people who care about giving back to society, but if it builds up its track record, in five or 10 years, this investor community will grow, because more people will trust this product.

Now, for the first time, business operators also have the opportunity to run their businesses, where they can build on the results of very constructive efforts, learn, and demonstrate the value of their work in five or six years, not the usual one or two years.

Society benefits too, because there are fewer crimes and fewer victims.

It's actually good for criminals too.

Even if I get out of prison with a few thousand yen, I don't even know where to go half the time.

Now let's look at another example: child care initiatives.

Now, in any field where you're spending so much money and not getting good results, social impact bonds can work.

Children in foster homes tend to go down the wrong path.

Only 13% of 16-year-olds achieve the standard score in the five subjects of the GCSE, the standardized test taken at the end of compulsory education, compared to the national average of 58%.

To make matters worse, 27% of incarcerated offenders have spent time in a nursing home.

More worryingly, Home Office statistics show that 70 percent of prostitutes have been in foster homes.

the country is not a very good parent

But there are many better programs out there for adolescents in need of care. Thirty percent of children who go to nursing homes are also adolescents.

So we set up a program with the Essex County Council to test intensive family support, aimed at families with adolescents.

The county of Essex only pays when it saves money on assistance.

About 500 million yen was collected from investors

The program started last month

And then there's homelessness in London, youth, employment and education across the country, youth, employment and education across the country.

Now there are 13 social impact bonds in the UK, and this idea is getting a lot of interest around the world, and this idea is getting a lot of interest around the world.

Prime Minister David Cameron has also endorsed the idea by contributing about $34 million to the Social Performance Fund.

Even President Obama has said that we should put a national budget of about 30 billion yen into these projects, and many countries are showing great interest in them.

Why is it so exciting?

What's the difference?

The first, which I mentioned earlier, is innovation.

Because it allows us to try out new ideas in a way that everyone can accept.

Second, because it's strict.

Because we need to validate data and incorporate it into problem solving for results.

In the case of Peterborough Prison, we've incorporated case management into all the organizations that we work with, and everyone is sharing what they're doing with inmates, and at the same time, we're getting input from the Department of Justice.

We look at that and adjust the program.

And this leads to the third thing, which is unprecedented flexibility.

Ordinarily, when you sign a contract, you're using government money -- you're using our money, your tax dollars, and business people are very aware of that, and they want to be more in control of how they spend their money.

As any entrepreneur here knows, version 1.0 of a business plan doesn't work.

When you try these things, you need to be flexible and adjust the program accordingly.

So, back to Peterborough Prison, again, we started out with a plan, but we also collected data, and as the project progressed, we tweaked the plan, made changes, added new elements, adapting the service to meet both long-term needs and short-term needs, so that we get more commitments and longer-term commitments from inmates.

Last point is partnership

I hear a lot of cliched arguments these days about programs like this should be done by the government, or should be in the public sector, or in the private sector, or in the third sector.

But if we're going to bring about social change, we have to bring together the expertise of all these stakeholders to come up with solutions.

Through this, we create a system that connects everything.

What would this idea change?

This initiative gives us the means to invest in social change.

I've met thousands, maybe millions, of people looking for opportunities to invest in social change.

On the other hand, in the public sector, I've met some wonderful people who are very interested in these efforts.

With this model, we can connect the two.

thank you

(applause)

Throughout our lives, our bodies go through an amazing series of changes as we grow up, go through puberty and many of us have children.

Behind the scenes, the endocrine system is constantly coordinating this shift.

As we grow and reach sexual maturity, the endocrine system regulates everything from sleep to the rhythm of our heartbeat, affecting each cell.

The endocrine system depends on the interaction of three functions to perform its duties: endocrine glands, hormones and receptors on trillions of cells.

First, there are several hormone-producing glands, three in the brain and seven outside the brain.

Each one is surrounded by a network of blood vessels, from which they extract raw materials and manufacture dozens of hormones.

These hormones are released in small amounts and normally enter the bloodstream.

From there, each hormone must locate a target cell to effect a specific change.

To find the target, we rely on the help of receptors on the surface of the cell or inside the cell, made up of specialized proteins.

These receptors recognize specific hormones and bind to them when they're in close proximity.

When bound, the combination of hormones and receptors triggers a series of events that amplify or reduce specific activities within the cell, altering the way the cell functions.

When millions of cells at a time are exposed to carefully controlled amounts of hormones, the endocrine system initiates massive changes in the body.

Take, for example, the thyroid gland and its two hormones, triiodothyronine and thyroxine.

These hormones visit most cells in the body and affect how quickly they use energy and how quickly they act.

In turn, it regulates everything from breathing rate to heartbeat to body temperature to digestion.

Hormones bring about the most visible and familiar phenomenon of puberty.

In boys, puberty begins when the testicles begin to produce testosterone.

This is the beginning of the gradual development of the genitals, the growth of a beard on the face, the change of voice and the growth of height.

In girls, the estrogen secreted by the ovaries signals the beginning of adulthood.

This allows the body to develop, widen the hips, and thicken the lining of the uterus to prepare for menstruation and pregnancy.

The endocrine system has long been mistaken for making only male hormones in men and only female hormones in women.

In fact, both men and women have estrogen and testosterone, the only difference being the amount.

Both hormones play a role in pregnancy, and more than a dozen other hormones ensure fetal growth, enable birth, and help mothers breastfeed their babies.

The timing of hormonal changes is also associated with mood changes.

Because hormones also affect the production of certain brain chemicals like serotonin.

And when there's a change in chemical concentration, it causes a change in mood.

But hormones don't have infinite power over us.

Hormones control our behavior, and it's easy to think that, especially during adolescence, they control us like slaves.

But research shows that our behavior is holistically shaped by a multitude of influences, including the brain, neurotransmitters, hormones, and social factors.

The primary role of the endocrine system is to regulate various bodily activities, not to dominate us.

Sometimes illness, stress, or diet can interfere with hormonal regulation by altering the amount of hormones produced by endocrine glands or by altering the way cells respond.

Diabetes, the most common hormonal disorder, occurs when the pancreas does not produce enough insulin, the hormone that regulates blood sugar levels.It occurs when the pancreas does not produce enough insulin, the hormone that regulates blood sugar levels.

Hypothyroidism and hyperthyroidism occur when the thyroid gland either produces too little or too much thyroid hormone.

Too little thyroid hormone can slow your heart rate, make you feel tired and depressed, and too much can lead to weight loss, poor sleep and irritability.

But most of the time, the endocrine system is what keeps the body in balance.

And by constantly adjusting, we ultimately orchestrate the changes that allow us to be who we are.

We have a global health problem right now, because the current method of researching and developing new drugs is too costly, too slow, and it fails more often than it succeeds.

It's just not working, which means that the new treatments that are really needed aren't getting to patients, and the disease is still spreading.

We seem to be investing more money than ever before.

R&D investment The number of new drug approvals per 100 billion yen is declining

Spend more money, produce less medicine

What's going on?

There are many reasons for this, but I think one of the main factors is the tools we use to test new drugs.

There are two main tools that we have right now.

cell culture and animal testing

Let's look at the first cell culture.

cells function in our body

Even if you take just the cells from their original environment, put them in a petri dish like this, and try to make them work again.

so it doesn't work

Cells don't like that kind of environment, after all, the situation is different from inside the body.

But what about animal testing?

Animals actually provide us with very useful information.

Thanks to animals, we know what happens in complex organs.

you can learn a lot of things that are really biological

But often, animal studies don't tell us what happens to humans when treated with a particular drug.

So we need better tools

We need human cells, but we have to find a way to take them out of the body and put them in a comfortable environment.

our bodies in a dynamic environment

always in motion

cells are also affected

cells in our body's dynamic environment

It's always under mechanical force.

So in order to create a comfortable environment for cells outside the body, we have to become cellular architects.

I will design and build a second home for these cells.

The Wyss Institute at Harvard University has succeeded in doing just that.

It's an "organ-on-a-chip"

here it is

Beautiful, right? it's really amazing

What I have in my hand is a living, breathing human lung on a chip.

It's not just beautiful

You can really do a lot with this

The living cells on that little chip are in a dynamic environment, interacting with different types of cells.

Many people are trying to grow cells in the lab,

Various approaches have been taken

There was even a lab to make mini organs.

what we are thinking

Instead, we're going to create a minimal functional unit on this tiny chip, and within it, we're going to replicate the biochemistry, the functions, the mechanical distortions that cells are affected by in the human body.

let me show you how it works

Using computer chip manufacturing technology, using computer chip manufacturing technology to make these structures more relevant to real cells and environments.

There are three fluid channels here.

In the middle is a porous, flexible membrane that has human cells on top of it, like the lung, and underneath that are the capillary cells -- the cells that live in your blood vessels.

In addition, we can apply mechanical forces to the chip, and the membrane will stretch and contract, so the cells will experience the same mechanical forces that we experience when we breathe.

are affected in the same way as they are in our bodies.

Air flows through the upper channels, and liquids containing nutrients flow through the blood vessel channels.

Now, chips are great, but what can you do with them?

This little chip has great functionality This little chip has great functionality

let me show you

For example, you can simulate infection by injecting bacteria into your lungs.

It also contains human white blood cells.

Then, because the white blood cells are the defense against bacterial invasion, when the white blood cells sense the inflammation caused by the infection, they enter the lungs through the blood vessels and engulf the bacteria.

Let's see this in action with human lungs on a chip.

I've marked the white blood cells, so you can see they're flowing.

And then it stays there, trying to get into the lungs, entering through the blood vessels.

As you can see, you can actually see the movement of a single white blood cell.

It stops and wiggles through layers of cells, through holes, out through the membrane on the other side, and immobilizes the green-marked bacteria.

You've seen the body's most basic response to infection, recreated in that tiny chip.

this is the immune response

It is wonderful

The next thing I'm going to show you is this picture, which is not only beautiful, but also very informative.

These cells are taken from the small airways in our lungs, but we also have these hairy hairs in our lungs.

They're called cilia, and they're responsible for getting mucus out of the lungs.

I feel sick when I say mucus

But mucus is very important.

It's the mucus that captures particles and potential viral allergens, and these cilia move to push the mucus out.

If the cilia are damaged, for example by smoking, the cilia can't function properly and they can't get the mucus out.

get sick like bronchitis

Cilia and mucus drainage are also implicated in serious diseases like cystic fibrosis.

Now that these chips have enabled the cells to function, we've begun exploring new therapeutic possibilities.

We don't just build lungs on chips.

I made an intestine

this is right

Human intestinal cells are put into an intestinal chip and given a constant peristaltic motion, a wave-like movement from cell to cell, which allows us to mimic many of the functions that can occur in the human gut.

Now we can also model diseases, like irritable bowel syndrome.

many people suffer from this

It's really hard on the body, but the reality is that there aren't very good treatments.

Now, in our lab, we're building a series of mechanisms that connect chips from different organs.

In fact, the real power of this technology lies in its ability to fluidly connect these chips.

Fluid flows through these cells, connecting various organ chips together to create what we call a virtual human body on the chip.

I'm really happy

We're not going to replicate the entire human body with these chips, because our goal is to replicate enough functionality to make it more predictable about what happens in the human body.

For example, now we can see what happens when we put drugs, such as aerosol formulations.

If you have asthma, like me, you can use an inhaler to study how a drug enters your lungs, is absorbed by your body, and what it does to your heart.

Does your heart beat change?

Is it toxic?

Is it detoxified by the liver?

Is it metabolized in the liver?

Is it excreted by the kidneys?

We can dynamically study how the body responds to drugs.

This is very revolutionary, it's a game-changer, not just for pharmaceutical companies, but for many industries, including the cosmetics industry.

Now, with the skin chips we're developing in our lab, we'll be able to confirm that the ingredients used in cosmetics are actually safe to use on the skin, and without animal testing.

We can also verify that the chemicals we are exposed to on a daily basis are safe, such as those found in household cleaners.

If we have an organ chip, we can apply it to bioterrorism and radiation exposure.

You can also learn a lot about dangerous diseases like Ebola and SARS.

Organ chips will change the way we do clinical trials.

Right now, clinical trials target average patients, because they're average.

So it tends to target middle-aged people and women.

Children aren't often the subject of clinical trials. Children take drugs every day, but the only data that proves their safety are adults.

children are different from adults

not necessarily react in the same way as adults

There are other genetic differences, and other genetic differences that put certain people in risk groups, and they may also be more likely to experience drug side effects.

So what if you could take cells from different people, put them on a chip, and replicate different populations on the chip?

This really changes clinical trials.

Here's everyone on the team doing this work.

We have engineers, we have cell biologists, we have clinicians, we work together.

Great things are happening here at the Wyss Institute.

Different disciplines converge here, and biology is influencing the way we design and design and build.

it's funny

We're building important cross-industry partnerships, for example, we're working with companies that specialize in large-scale digital manufacturing.

This allows us to make millions of chips, not just one, and put them in the hands of as many researchers as possible.

This is what opens up the possibilities of this technology.

Let me show you our machine here.

This is what our engineers are prototyping in the lab right now, and this machine will allow us to technically control and link more than a dozen organ chips.

Other Important Features

Easy to use interface

If you're a cell biologist like me, you can take a chip, put it in a cartridge, just like this prototype, put the cartridge in the machine just like a CD, and you're good to go.

Just connect and switch on

Just imagine what you can do in the future by taking your stem cells and putting them on a chip.

your own chip

Each of us here is different, and these individual differences lead to different, sometimes unexpected, reactions to drugs.

I myself had a terrible headache about two years ago, and it just wouldn't go away, and I thought, "I have to do something."

I took some pain relievers, and 15 minutes later, I was in the hospital, having a terrible asthma attack.

I wasn't fatal, but unfortunately the side effects of these drugs are sometimes fatal.

how do you prevent that?

Someday, we'll make a chip for Geraldine, a chip for Daniel, and a chip for you.

We may be able to provide personalized medical care for that person.

Thank you. (Applause)

People hate me when I do my job

In fact, the better you do a job, the more people hate you.

Policewoman watching illegal parking? No, I'm not a funeral director.

I'm a progressive lesbian and a political commentator.

I'm on FOX News. (Applause) Did you hear me? I'll say it again

I'm gay and I'm a commentator on FOX News.

Today I'm going to share with you my method and the most important thing I've learned.

First appeared on TV

I argue with people who want to literally erase everything I believe in, and sometimes people who want to deny the existence of me or my allies.

It's like talking to your ultra-conservative uncle on Thanksgiving holiday, and you're doing this in front of millions of TV viewers.

For example, it's exactly like that

As far as broadcasting

I get unbelievable harassing emails

In the last week alone, I received 238 nasty emails, plus countless hateful tweets.

I write about myself like this: Fool, traitor, evil, disgusting woman, and ugly man.

(Laughs) After being on the side of receiving all sorts of ugliness, what did I really think?

The biggest conclusion is this: While we've focused on political correctness for decades, it's more important to practice emotional correctness.

Let me give you a little example

It doesn't bother me at all when people write that I'm lesbian.

I'm worried about two things

The first is whether the word is spelled correctly.

(Laughter) (Applause) Let's review for a moment.

It's different and you must be pretty surprised

Second, it's not so much about the words themselves, but how the words are used.

Did you show affection or did you just not know it was discriminatory?

Or it doesn't matter if you really want to hurt me personally.

Emotional correctness is determined by the tone of your words, the way you put your emotions into it, the way you say it, the respect and care you show to each other.

And what I've come to realize is that political persuasion doesn't come from ideas or facts or data.

Political persuasion comes from "emotional correctness"

By the way, on my first day at work on FOX News, I was expecting conservative ape claw marks on the carpet at work, if I had to confess.

Did you notice any movement? This is incorrect as "emotional correctness"

But liberals on "my side" can be complacent, condescending, and contemptuous of those who disagree with them.

It's right for political correctness, but wrong for emotional correctness.

By the way, what that means is that you hate those people, right?

Now here's the thing!

Conservatives are really good people

Well, not all of them are nice people, and not all conservatives send harassing emails.

Sean Hannity is one of the nicest people I've ever met.

He uses his free time to introduce people in his company to dates, and if I had a problem, he would do anything to help me.

I think Sean Hannity's "Political Correctness" is about one percent, but "Emotional Correctness" is great.

That's why people listen to him

It is only when you hear your own opinion that the other person agrees with you.

We spend a lot of time just telling each other off, and we don't talk much about our disagreements.

If we can find compassion for each other, it opens up the possibility of building common ground.

I know it sounds really corny to say it here, but if you get people to use it, it's a really powerful ally.

For example, if someone says they don't like immigrants, I try to imagine how they feel.

To those who say they don't like the teachers' union, I'm afraid they're just looking for the bad guys when they see the devastation in their school.

Our challenge is whether we can find the compassion that we expect from others.

That is "emotional correctness"

it won't be easy

I, too, have to hold back five or six times a day on average, lest I respond to harassing emails and bombard them with filthy abusive language.

Finding compassion and common ground with your adversaries is a kind of political and spiritual exercise for me.I'm not the Dalai Lama.

I'm not perfect, but I'm optimistic because I'm being sent

Because it's not just hate mail

I get a lot of really nice letters too.

And one of my all-time favorites is this one: "I'm not a big fan of your political stance, and I'm not a big fan of your sometimes esoteric logic, but I'm a big fan of you as a person."

This person doesn't agree with me, but not yet.

(Laughter) But he didn't listen to what I said, but how I said it.

Even though we've never met face-to-face, we somehow managed to reach each other

This is how emotional correctness can start a conversation that leads to real change.

thank you

(applause)

(Underwater sounds) This video was shot in the Aquarius Undersea Laboratory, six kilometers off the coast of Key Largo, Florida, 18 meters below sea level.

NASA uses this extreme environment to train astronauts and divers, and last year the lab invited us to join them.

We captured the whole story in our open ROV, a robot we built in our garage.

An ROV is a remotely operated vehicle, and we've got a little robot that sends live video through that tiny tether cable to a computer at sea.

It's open-sourced, and it puts all the design files and programs online, so anyone can modify it, improve it, change it.

It's built almost off-the-shelf, and it costs about a thousand times less than the ROV that James Cameron used to explore the Titanic.

ROVs are nothing new

has been around for decades

used by scientists for ocean exploration

Oil and gas companies are using it for offshore research and construction.

What we create isn't unique

The way it was made was so unique

Here's a quick introduction to how it all happened.

A few years ago, my friend Eric and I decided to explore this underwater cavern in the foothills of the Sierra Nevada.

I heard that gold stolen during the gold rush was hidden there, and I wanted to go there.

Unfortunately, I didn't have the money at the time, I didn't have the tools.

Eric had a basic idea for a robot design, but he couldn't figure out the details on his own, so in this situation, as you might expect, he turned to the Internet for help.

We launched this website, openROV.com, where we shared our goals and plans. For the first few months, Eric and I were the only people interacting on the message board there.

I've learned a lot through this effort.

After prototyping, we finally decided to go into the cave, and we were ready to go.

Around the same time, word of this little expedition spread, and the New York Times picked it up.

We were overwhelmed, because a lot of people asked us to build this open ROV -- they wanted a build kit.

So we launched this project on Kickstarter, so we launched this project on Kickstarter, and within two hours, we had raised the money we were aiming for, and suddenly we had enough money to build this kit.

I had to learn how to make

Because we need small lot production.

I soon realized that my old garage was too small,

We did it. TechShop helped us build the kit. They were very helpful. We shipped this kit all over the world. It was just before Christmas last year, so it's only been a few months.

But we're already getting videos and photos from all over the world, including this one from under the Antarctic ice.

I also learned that penguins love robots.

(Laughter) We still put all of our blueprints online so that anyone can build them themselves.

this was the only way

By making it open source, we're expanding this R&D network and developing it faster than any venture company.

But robot building itself is just the beginning.

The real potential, the long-term potential, is this DIY ocean explorer community that's growing around the world.

If you have thousands of these machines floating in the ocean, if you have thousands of these machines floating in the ocean, what you can find is endless.

Now what happened to that cave?

Did you find gold?

No, I didn't have any money, but I found something worth more than that.

It was a glimpse into the amazing future that ocean exploration has to offer.

This is something that anyone can participate in, not just the James Camerons of the world.

Let's explore the underwater world together

thank you

(applause)

The urban mobility challenge in the developing world is a very unique challenge because, unlike health, education and housing problems, they tend to get worse as societies get richer.

It's a completely unsustainable model.

If you look at mobility as an issue for most of the rest of the developing world, it's not so much about money and technology as it is about equity and equity.

Inequality in developing countries is so high that it obscures many problems. For example, from a transport perspective, a developed city is one where the poor don't drive, but the rich use public transport.

So is bicycle use. In Amsterdam, for example, more than 30 percent of the population uses bicycles, even though the Dutch actually have a higher per capita income than the United States.

Cities in developing countries around the world often clash over how governments invest money.

If you invest too heavily in highways, of course, you'll have less money for housing, schools, hospitals, and there's also space conflicts.

There's an emerging space conflict between car owners and non-car owners There's a growing space conflict between car owners and non-car owners.

Most people today believe that private ownership and the market economy are the best ways to manage large amounts of social capital.

But there's a problem with that, which is that the market economy can't work without income inequality, which means the market economy can't work without income inequality.

Some people make more money, some people less

There are companies that succeed and companies that fail.

So what kind of equality should we seek in the market economy today?

I have two suggestions, both related to cities.

The first is equality in the quality of life, especially for children, so that every child has access to things that are taken for granted, like health and education, as well as green spaces, sports facilities, swimming pools, music classes, and so on.

And the second is what we call "democratic equality."

The first article of any constitution declares that all citizens are equal under the law.

this is not just a fancy word

It's a powerful principle

For example, if that were true, a bus with 80 people would have 80 times more right to use the road than a single car, and 80 times more right to use the road than a single car.

Sometimes we are so used to injustice that we can't even notice it when it's happening right in front of us.

Less than 100 years ago, it was normal for women not to vote, just as it is normal today to see a bus in a traffic jam.

In fact, when I became mayor, by applying the principles of democracy, where the public good trumps the private interest, that a 100-passenger bus has 100 times the right to use the road as a car, we implemented a bus-based mass transit system with dedicated lanes.

To make the bus more attractive, we named it Transmilenio (21st century vehicle).

It's a very democratic and beautiful symbol, because the sight of luxury cars stuck in traffic while a bus goes by is a very picture of democracy.

It's not just that it's actually fair.

You don't have to be a doctor to understand

In just 20 minutes, even a 12-year-old child commissioner will realize that the best way to use the little space on the road is to create dedicated bus lanes.

In fact, even if the bus is unattractive, it is the only vehicle that can enable mass transit to all areas in a rapidly growing developing city.

Buses have great potential

In Guangzhou, the Transmilenio system carries more passengers than any other subway line in China, with the exception of one line in Beijing, and at a fraction of the cost.

We didn't just fight for bus space, we fought for human space, which was even harder.

People live in cities and we walk in cities.

Just as fish need to swim, birds need to fly, and deer need to run, humans need to walk.

When you think of cities in the developing world, pedestrian-vehicle conflict is a huge problem.

The picture you see here is an immature democracy.

As you can see, people walking are third-class citizens, and people driving cars are first-class citizens.

From a mobility and transportation infrastructure standpoint, it's not the highways and subways that really make the difference between the advanced and the backward cities, it's the sidewalks that are well-equipped.

A flyover is built here, but they forgot to build a sidewalk.

This is happening all over the world

Even a child going to school is valued less than a car.

In my city, Bogotá, we fought a very difficult battle to make space out of places that have been parked on the sidewalks for decades, to make space out of places that have been parked on the sidewalks for decades, to create places where people can have human dignity, to create places where people can have human dignity, and to create safe bike lanes.

I didn't have gray hair when I started.

(Laughter) And halfway through, I was on the brink of impeachment.

it's a very difficult battle

But in the end, we made it. After the uphill battle to build a city, we had a place that showed some respect for human dignity and taught us that pedestrians are just as important as people in cars.

In fact, ideologically and politically, in any region, the question is how to distribute the city's most important asset: road space.

Even if a city finds oil and diamonds underground, they're not worth much compared to road space.

How do you distribute road space to pedestrians, cyclists, public transport and cars?

This isn't a technical problem, just remember the fact that no constitution states that parking is a constitutional right in making that distribution.

I built this one, too, 15 years ago, before there were bike paths in New York, Paris, and London.

I don't think there are any attractive structural features to the bike protection road.

But it's a right, like a sidewalk, unless you believe that only motorists have the right to travel safely without the risk of being killed.

And just like bus lanes, bike lanes are a powerful symbol of democracy, because they represent that a citizen riding a $30 bike is just as important as someone in a $30,000 car.

we live in an extraordinary time in history

Over the next 50 years, more than half of the cities that will be built in 2060 will be built.

In many developing world cities, 80 to 90 percent or more of the cities built in 2060 will be built in the next 40 to 50 years.

But this is not just about urban development in developing countries.

For example, in the United States, over 70 million homes will have to be built over the next 40 to 50 years.

That's more than the total number of homes in Britain, France and Canada today.

My belief is that cities today, while seriously flawed, can be made better in a different way.

What is wrong with our cities today?

Well, let's say, for example, if you say to a three-year-old kid who's just starting to learn the language, and you say, "Watch out for cars," in any city in the world these days, they're going to startle and jump.

The city's history dates back 8,000 years, when children could play outdoors.

In fact, until very recently, in 1900, there were no cars.

It's actually been less than 100 years since cars first hit the market.

Cars transformed cities

For example, in 1900, no one in the United States died in a car accident.

Just 20 years later, between 1920 and 1930, about 200,000 people died in car accidents in the United States.

In 1925 alone, about 7,000 children died in car accidents in the United States.

I believe we can build a better city, a city that puts people before cars, a city that puts people before cars, a city that gives people more public space than cars.

I'd like to offer you two ingredients that I think make cities better, and that are very easy to implement in emerging cities.

Hundreds of kilometers of green roads cross the city in all directions Hundreds of kilometers of green roads cross the city in all directions

Children can leave the house and walk to a safe space

A child can travel for dozens of kilometers safely and without any danger on a wonderful greenway. It's like a bicycle highway.

In a new city that's about to be built, this isn't particularly difficult.

When I was mayor of Bogota, in just three years, we were able to build 70 kilometers of bike lanes in one of the most congested cities in the world.

And it's changed the way people live, how they get around, how they enjoy the city.

Look at this picture, in one of the very poor neighborhoods, there's a gorgeous bike-pedestrian street, and the cars are still covered in mud.

Of course, I wanted to pave this street for cars.

But what should we prioritize?

99% of the people in this neighborhood don't own a car.

But folks, it's really easy to embed this kind of infrastructure when you're developing a city, it's really easy to embed this kind of infrastructure.

Then the city will grow around it.

And of course this is just the beginning of something going in a good direction, and of course this is the very beginning of something going in a good direction.

The second ingredient will solve the transportation problem, which is a very difficult problem in the developing world, to create a very low-cost, simple, hundreds-of-kilometers street with bus, bicycle and pedestrian paths.

If these things are built in from the beginning, it's a very low cost solution. If these things are built in from the beginning, it's a very low cost solution.

Unfortunately, reality doesn't quite work out like a dream.

Because of private land ownership and soaring underground All developing countries have big problems of slums because of private land ownership and soaring underground.

In my home country of Colombia, almost half the houses in the city are legally constructed.

It's very difficult to have mobility and use a bicycle in that kind of environment.

But even legal constructions are built in the wrong places, making it impossible to provide low-cost, frequent public transportation far from metropolitan areas.

As a Latin American, and because the most recent urbanized region is Latin America, I would like to advocate with awe and passion to the countries that have not yet been urbanized: the rate of urbanization in Latin America has gone from 40 percent in 1950 to 80 percent in 2010. And I would also like to make a statement to the countries of Asia and Africa that have not yet been urbanized. should get

That way, cities can grow in the right places with the right spaces, parks, greenways, bus routes.

The cities we build in the next 50 years, the cities we build in the next 50 years, will determine the quality of life and well-being of millions of people in the future.

Now is the perfect time for the leaders of their countries, and especially the young leaders of the developing world, and especially the young leaders of the developing world.

You create happier lives for millions of people in the future.

I'm positive, I believe they're going to make the city better, and it should be more than our wildest imagination.

(applause)

A couple of years ago, Harvard Business School chose the best business model of the year.

The result is Somali piracy.

Around the same time, I learned that 544 sailors were being held hostage on board, most of them being held with the ship in the clear waters off the coast of Somalia.

Given these two facts, how could this happen in shipping?

What about other industries? I also thought

Could 544 pilots be held hostage in a jumbo jet on the runway for months or even a year?

What about greyhound coach drivers?

it's not likely to happen

intrigued

I also learned a new truth, and it may surprise you that I didn't realize this until I was 42 or 43 years old.

How we are still essentially dependent on maritime transportation.

Most people probably think of maritime shipping as an old-fashioned industry, hauling things on sailboats, yes, the world of Moby Dick and Jack Sparrow.

but it's not really

Maritime transport has never been more essential.

It carries 90% of world trade.

Sea freight has quadrupled since 1970.

Now is the time to rely more than ever

But almost no one realizes that there are 100,000 ships at sea that support such a huge industry.

But it would be strange to say that in Singapore, where maritime transportation is so common here that you can dock your boat on the roof of a hotel.

(Laughter) But if you ask the average person, anywhere in the world, what they know about maritime shipping and the scale of it, I think they'll be taken aback.

When I asked passersby if they knew Microsoft When I asked passersby if they knew Microsoft

I'm sure you'll say yes, because you've written software and you know it works on your computer.

But I doubt you'd get the same answer if you asked about Maersk.

[$60.2 billion] And it's not known Why?

A few years ago, the First Sealord of the British Admiralty -- the highest post in the Navy is a Sealord, but the head of the Army is not called a Landlord -- pointed out that we, the industrialized nations of the West, are blind to the sea.

We don't see the sea as a place of industry and work We don't see the sea as a place of industry and work

The sea is flying over the blue area on the map

Nothing to see, just jump over

So I wanted to open my own eyes from my blindness to the sea and I went out to sea.

About two years ago, I made the trip on the Maersk Kendall. About two years ago, I made the trip on the Maersk Kendall.

It was an eye-opening experience

I've sailed five seas, two oceans, nine ports I've sailed five seas, two oceans, nine ports and learned a lot about shipping

The first surprise on board the Kendall The first surprise on board the Kendall Where are they all? That's what it means

I've heard from friends in the Navy that they sail with 1,000 sailors at a time, and the Kendall had a crew of just 21.

This is because maritime transport has become very efficient.

containerization can be very efficient

Today ships are automated

Can operate with a small crew

But what that means, in the words of a pastor at the port, is that most of the crew on board a container ship is tired and exhausted, because the pace of modern shipping is abusing what we call the "human factor."

Many container ship crews are usually in port for less than two hours.

no time to relax

Once out of port, for months at sea, even a 5-year-old child can't use the internet, which is a given.

Another thing that surprised me when I boarded the Kendall was the person sitting next to me at the table, not Her Majesty. For some reason, I was seated under the Queen's portrait -- in the dining hall, sitting next to me was a Burmese man, across from me was a Romanian, a Moldovan, an Indian.

The table next to us was Chinese men, and the crew's dining room was all Filipinos.

this is a common workboat

Why is this happening?

It's because of the thing that has changed the shipping industry most dramatically in the last 60 years without the public paying attention to it: the spread of free or convenience registration.

Now, as long as it is registered, it doesn't matter what nationality the shipowner is, you can fly any flag as your ship's flag.

You can fly the flags of countries that don't border the sea, like Bolivia, Mongolia, North Korea, which you don't see very often.

(Laughter) So we have a very multinational, global and diverse crew on board.

it was a surprise to me

When we entered pirate waters, as we descended the Bab el-Mandeb Strait into the Indian Ocean, everything changed on board.

It was a shock, because suddenly I remembered what the captain had said to me, "You're reckless for going into pirate waters on a container ship."

I can no longer go out on deck

Lookout doubled

At that time, 544 seafarers were held hostage, and some were held hostage for years because of their maritime fate and their flag of convenience.

Not all, of course, but some irreverent shipowners can easily hide behind the anonymity of a flag of convenience.

Are there any other blindness to the sea?

When you go out to sea in your ship or cruise ship Look at the chimney When you go out to sea in your ship or cruise ship Look at the chimney You can see black smoke coming out

The reason for this is that sea freight is very low profit and they try to make fuel cheap. They use what's called bunker oil, and I've heard from people in the tanker industry that this is refining residue, and it's almost like asphalt.

Maritime transportation is an environmentally friendly transportation method.

In terms of carbon emissions per tonne per mile, it's 1000 times less than an airplane and 10 times less than a truck.

But it's not environmentally friendly because it's a lot.

Maritime emissions are about three to four percent, which is about the same as aircraft.

But if you take maritime transport emissions into national carbon emissions, it ranks sixth in the world, and it's about the same as Germany.

In 2009, it was estimated that the top 15 megaships would pollute as much as all the cars in the world, in terms of particles, soot and toxic gases.

Fortunately, all eyes are on sustainable maritime shipping.

There are some interesting new ideas going on.

why is it taking so long

When are we going to start talking about sea freight as well as air miles? When are we going to start talking about sea freight as well as air miles?

I also traveled to Cape Cod to see the plight of right whales in the North Atlantic, because this was one of the things that surprised me the most about life at sea, and it made me think about it.

We know the human impact on the ocean in terms of fishing and overfishing. We know the human impact on the ocean in terms of fishing and overfishing.

In fact, maritime transport is a problem here as well, because the noise of maritime transport is detrimental to the auditory habitats of marine life.

Light doesn't reach below the surface, so marine life like whales, dolphins, and 800 species of fish communicate with sound waves.

The sounds of right whales in the North Atlantic can be heard hundreds of kilometers away.

Humpback whales can transmit sounds across the Atlantic.

But we also hear giant tankers cruising across the ocean, but we also hear giant tankers cruising across the ocean, and the sound that the propellers make in the ocean sometimes overlaps with the frequencies that whales use, which can harm their auditory habitat, but whales rely on sound to breed, find food, and even find mates.

The loss of auditory range in North Atlantic right whale habitat has reached 90%.

But there are still no laws regulating noise pollution.

And when I got to Singapore, I'm sorry, but I didn't want to get off the ship.

I really didn't want to leave the Kendall.

The crew took good care of me, and we had a funny, talkative captain, and if it was another five weeks, I'd be happy to sign it.

But they didn't stay there for nine months at a time.

The rewards are good, but what you get is a dangerous, difficult, still lonely and hard life.

And finally, my heart is at war with you, because I really don't think the sailors I want to pay tribute to are being thanked enough for the 90 percent of our supplies that they carry.

I also want to pay tribute to the 100,000 ships at sea, who continue their work of entering and leaving, delivering what they need every day.

But at the same time, I'd like to focus on maritime shipping, and I would like us, the ordinary people, who don't know too much, to pay more attention, and also to be a little more transparent, to stay 90 percent transparent.

Because I think it's very easy and it makes sense for everyone. Because I think it's very easy and it makes sense for everyone. That's learning to look to the ocean.

thank you

(applause)

I want to talk to you today about how architecture has changed the lives of my community, and how it has opened doors of hope.

i am from burkina faso

According to the World Bank, Burkina Faso is one of the poorest countries in the world. What does it mean to be born and raised in such a country?

I would be an example

I was born in a small village called Gund.

Gund has no electricity, no clean drinking water, no school.

But my father wanted me to be able to read and write.

That's why I left my parents when I was seven years old, and I had to live alone in a town far from the village where I had no contact with my family.

Here I spent six years - I studied with over 150 students I studied with over 150 students I studied with over 150 students

At that time, I would sometimes come to school and be told that a classmate had died.

Even now the situation has not changed much

There is still no electricity in my village.

People are still dying in Burkina Faso. Access to clean drinking water is still a big problem.

I was lucky, because for someone like me, this is the reality.

but i was lucky

Scholarships for studying in Germany

was able to get

So it goes without saying how wonderful it is for me to be able to speak in front of you like this now.

From Gand, from my hometown of Burkina Faso, coming to Germany to become an architect is a huge step.

how to repay this favor

Ever since I was a student, I've wanted to give the children of Gund a better chance.

I wanted to use my talents to build a school.

But at the time, I was a student and had no money.

So I got the idea to paint and collect money So I got the idea to paint and collect money

money was not so easy

I asked my classmates to save a little money on coffee and cigarettes and put it towards my school building project.

It's been two years since then, and I've managed to raise $50,000.

And when I went back to Gund and I told them the good news, I went back to Gund and I told them the good news, and they were filled with hope, but they were stunned when they heard about my plan to use the soil, when they heard about my plan to use the soil.

"Earth buildings can't withstand the rainy season, but Francis says we should build a school out of earth.

Did he go to Europe for this instead of working in the village fields Did he go to Europe for this instead of working in the village fields and spend a lot of time studying? ”

In my village, we've been building with dirt for a long time, but no one knew about the innovation that lurked in the mud.

I tried to persuade everyone

After talking with the villagers, we finally persuaded everyone and construction began.

All the villagers, women and men, all the villagers, women and men, helped

I also used traditional methods

So, for example, when you make a floor with dirt, you have a young man stand up straight and tread it down for hours.

After that, this time

Stone the hardened floor for hours

And it turns out like this: it's like a baby's butt.

(Laughter) It's not Photoshopped. (Laughter) This is the school I built with the villagers.

All walls are made of compacted local Gand mud bricks All walls are made of compacted local Gand mud bricks

Roofs are usually put into concrete Roofs are usually made of cheap rebar that is put into concrete

And for the classroom ceilings, we use both clay and rebar.

The original idea behind building the school was simply to create comfortable classrooms.

In Burkina Faso, the temperature can get up to 45 degrees, so we wanted to make the classroom airy and a good place to teach and learn.

Here's what the school looks like now, 12 years later and it's still in great shape.

children love school

This project was a huge success for me and for my hometown.

It inspired me to do more projects with Gund It inspired me to do more projects with Gund

I've been involved in many projects, but today I'm going to show you just three of them.

The first, of course, is the school expansion project.

It's very difficult to explain drawings and engineering to illiterate people.

So I started prototyping

And the idea of ​​making a vaulted ceiling with clay was my breakthrough idea.

Even if I jump on top of it and jump with the whole team, it won't flinch.

I was fine even though everyone was watching

(Laughter) And here's what you see when the construction is done.

the children were very happy

Everyone in the village was proud that we made it.

Even animals like donkeys were happy

(Laughter) The second is the Gund Library.

Even if you want to incorporate more and more new things in new buildings

There are many earthen pots,

I decided to make an opening in the ceiling using a pot

First, as you can see in the picture, we take all the jars to the construction site.

This is what you get when you cut the jars, line them up on the roof, and pour the concrete.

This opening allows light to come in and hot air to escape. This opening allows light to come in and hot air to escape.

it's very simple

The most recent project was Gund's High School.

I would like to introduce you to everyone.

The innovation of this project was to create a foundation of mud, much like concrete.

how do you make a base out of mud

First, make the mortar as shown in the picture. When everything is ready and you can imagine the best formulation and form Once you can imagine the best formulation and form, start working with everyone in the village.

it's okay without me

because everyone works on their own

That's how I came to give a lecture today.

Another point in Gund is the rain

When the rainy season sets in, we rush to take action to protect our weak walls from the rain.

It's not Christo & Jeanne-Claude's packaging art.

It's just a way to protect the walls

(Laughter) In Burkina Faso, it rains intensively, flooding all over the country, flooding all over the country.

Rain is still important to us.

The rain carries the sand and gravel that we use in our construction along the river The rain carries the sand and gravel that we use in the construction along the river

wait for the rainy season to end

Collect sand and mix with soil and continue working Collect sand and mix with soil and continue working

as you can see

The Gund Project is also about education. If one day I suddenly collapse and leave this world, even if one day I suddenly collapse and leave this world, I want one person from Gund to take over this job.

surprisingly still alive

(Laughter) My peers are already making money with the skills they learned in the field.

In many cases, young Gund people have to go to the cities to earn money, sometimes they leave the country to work, and sometimes they never come back, undermining the village community.

But now I can stay in my country and work in construction and earn enough to support my family.I can now work in construction and earn enough to support my family.

That's the new facet of this project

As you know

I have won many awards through these projects.

Thanks to you, my path is widened

I became famous

But my reason for doing this project, above all else, was my village.

When I was little, I went to school in the city, and I used to go back to Gund every vacation.

By the end of the holiday, I went to every house in the village and said goodbye to everyone.I went to every house in the village to say goodbye to everyone.

Every woman in Gund took the little coin out of her dress pocket and gave it to me.

In our culture, this indicates deep affection.

Even a 7-year-old child was deeply moved.

One day I asked my mother, "Why do women love me?"

(Laughter) My mother said, "I hope that by supporting your education, you will grow up to be a good person, and that one day you will come back to this village and make a difference in our lives."

I hope that through my work in Gand, everyone in the village will be proud of me, and I hope that you will see the greatness of the power of the community, and the greatness of the power of the community, and that architecture can be a driving force for the community to shape its own future.

Thank you. (Applause) Thank you.

(applause)

How many of you have ever been in a cave?

Yes, how many people are there?

When most people think of caves, they think of tunnels cut through solid rock, and in fact most caves are.

In half the country, most of the caves are made of limestone.

But where I'm from, it's mostly lava caves, because there are volcanoes everywhere.

But what I want to show you today is a 100 percent ice cave, a glacial cave built on the slopes of Mount Hood, Oregon's highest mountain.

Mt Hood is just an hour's drive from Portland, Oregon's largest city of over two million people.It's just an hour's drive.

For cave explorers, the greatest attraction of exploration is finding a new cave and being the first human to enter it.

The second attraction is being the first person to map the cave.

Now, with so many people hiking everywhere, it's very difficult to discover new caves, so you can imagine how excited we were when we found three new caves just steps away from Oregon's largest city, and no one had explored them and they hadn't been mapped.

I feel like an astronaut, because I've been to places no one has been before and seen things no one has ever seen.

What is a glacier?

If you've ever seen or touched snow, you know it's very light because it's made up of tiny ice crystals that are mostly air.

If you squeeze a piece of snow to make a snowball, it's so tightly packed that it's very small and hard.

In places like Mt. Hood, more than 6 meters of snow accumulates in a year, pushing out the air into hard, blue ice, pushing out the air into hard, blue ice.

Each year the ice grows thicker and thicker until it becomes so heavy that it cannot bear its own weight and slides down the slopes of the mountains.

When the ice starts moving in groups like this, it's called a glacier, and it's a name.

The cave glacier we discovered is called Sandy Glacier.

Every year, new snow piles up on the glacier, which melts in the summer sun. The water that melts flows along the ice, forming small rivers that melt and burrow into the glacier, creating a vast network of caverns, sometimes all the way to the bedrock beneath the ice.

Amazingly, glacier caves create new tunnels every year.

Water drips from one place to another, creating different channels throughout the cave Water dripping from different places, creating different channels throughout the cave

The heated water scrapes the ice downwards from the surface, while the warmed air on the lower side of the mountain rises and enters the cavern, melting the cavern's ceiling and raising it higher and higher.

But the strangest thing is that the whole cave is moving, because the glacier itself, the size of a small city, the glacier itself, the size of a small city, is slowly sliding down the mountainside.

Well, he's Brent McGregor's caving partner.

He and I have been caving for a long time, and we've done a lot of mountain climbing, but we've never explored a glacier cave.

Back in 2011, Brent found a video on YouTube of a hiker encountering a glacier cave entrance.

No GPS coordinates, all I know is that it's somewhere on Sandy Glacier All I know is that it's somewhere on Sandy Glacier

So in July of that year, I went to the glacier and found a big crack in the ice.

We set up an anchor in the snow, put a rope on it, and rappel down the hole.

This is me looking into the entrance to the crevasse.

And when I went down to the bottom of the hole, I found a huge tunnel up the mountain under thousands of tons of glacier.

After walking about a kilometer through the cave, we came to a dead end, and as we walked back to the exit, we used a surveying instrument to 3D map the cave.

What do you think the cave map looks like?

It's not like a mountaineering map or a road map, because the potholes and holes are on top of each other.

When you survey a cave, you have to place a station every few feet inside the cave, and then use a laser to measure the distance between the stations.

We also use a compass and an inclinometer to measure the orientation of the cave and the slope of the floor and ceiling Measuring the orientation of the cave and the slope of the floor and ceiling

Trigonometry, which we learn in school, that math can help you make maps like this, that math can help you make maps like this, where you can find out the height and distance of a point without actually going there.

In fact, as the survey progressed and the survey progressed, I realized that the mathematics that I hated as a student was very useful.

So when you're done with the survey, you put all the data into a computer, and you ask someone who's good at drawing, and you end up with a map that looks something like this.

We named this cave the Snow Dragon Cave because it looked like a giant dragon sleeping under the snow.

That summer, as the snow melted from the glacier, more caves were discovered, and it turned out that they were all connected.

Shortly after completing the Snow Dragon survey, Brent discovered another cave not too far away.

The walls of the cave are covered in ice, so we had to wear crampons, boots with big spikes, to keep us from slipping.

this cave was amazing

The ceiling was shining blues and greens because the light was coming in from far above and it was going through the ice.It was shining blues and greens because it was going through the ice.

Why this cave is so much colder than the Snow Dragon Cave Why this cave is so much colder than the Snow Dragon Cave I didn't know until I reached the dead end

There was a huge vertical hole called a mulan (glacier hole) about 40m that led to the surface of the glacier.

A cold wind was blowing down from the top of the mountain, entering the cave, rushing in and freezing everything inside.

We were so excited to discover this new shaft that we returned the following January, hoping to be the first to explore it.

It was so cold outside that I had to go to sleep in a cave.

I set up camp on the left side of the space near this entrance.

The next morning, I climbed out of the cave, walked to the top of the glacier, and from there I put up a rope and rappeled down the hole for the first time.

Brent named this cave Pure Imagination, probably because what we saw there was beyond our wildest imagination.

Apart from the really cold ice, what else is there in the cave?

It's so cold that there will be very little life, because the entrance is covered with snow for about eight months of the year.

But there's something really cool out there.

There's a mysterious bacterium lurking in the water that actually eats and digests rocks for food to survive under the ice -- food for survival under the ice.

In fact, last summer, scientists took samples of water and ice to see if microscopic organisms that evolved to live in extreme environments, called extremophiles, live under the ice, and we expect to find similar organisms in the polar caps of Mars.

Another amazing thing is that the plant seeds and the dead bodies of birds that have fallen to the surface of the glacier are buried in the snow and gradually become one with the glacier and sink deeper and deeper into the ice.

When the cavern melts and pits the surface, these artifacts rain down from the ceiling and fall to the floor for us to discover.

For example, this rice fir seed we discovered

It's been frozen in ice for 100 years, and it's about to sprout.

Also, this mallard feather was found about 500 meters into Snow Dragon Cave.

This duck died on the surface of the glacier a long time ago, and its wings had sunk 30 meters while it fell into the cave, and its wings had sunk 30 meters while it fell into the cave.

This beautiful quartz crystal was also found in Snow Dragon Cave.

Brent and I are still amazed that a find like this has been hidden for so long in what feels like our own backyard.

In the fast-paced world we live in today, making discoveries seems impossible without space travel, but that's not the case.

Every year, unknown caves are discovered.

It's not too late to be the first discoverer now It's not too late to be the first discoverer now

You just have to focus your eyes and your mind so that when you go where other people don't go, and you go there, and when you come across a discovery, you're aware of it.

thank you very much

(applause)

I chose a story that will make you feel lighter, just like the first time.

Last time we talked about "death" and "dying".

I want to talk to you about mental illness.

And the content has to be technical, so I'm going to talk about "electroshock therapy."

You see... when a person noticed that the people around him and his colleagues thought he was "different," "something strange," or "depressed," what we know today as schizophrenia, it was believed that this kind of illness was caused by the entry of demonic spirits into the body.

A traditional method for treating these conditions is called exorcism.

As you know, it still happens today.

But getting help from a priest wasn't enough.

Around 450 B.C., when medicine was becoming somewhat scientific, Hippocrates and his disciples sought out plants with convulsive properties to literally shake evil spirits out of their bodies.

And I found some plants that give me cramps.

As for herbs, from the late Middle Ages to the Renaissance, the books of the period are full of convulsive prescriptions to cast out evil spirits.

And around the 16th century, a doctor named Theophrastus Bombastus Aureolus von Hohenheim, named Paracelsus, which might be more familiar to some of you.

Can you imagine? Pull out a mothball containing camphor from your closet and chew it.

It's better than taking Prozac when you're feeling down, but I wouldn't recommend it.

The 17th century, the 18th century continued the search for other convulsive drugs besides camphor.

This is where Benjamin Franklin comes in. He himself was electrocuted through a kite and almost had a seizure.

And then people started thinking about how to induce convulsions with electricity.

And let's skip to 1932. There were three Italian psychiatrists who were primarily treating depression, and they noticed that some of their patients also had epilepsy.

Not only can it be relieved, but it can also be completely cured.

So they became very interested in producing seizures, artificially controlled seizures.

They thought, "Okay, let's use electricity. Let's plug the patient into a wall outlet.

If you do that, you can shake a human to the point that your hair stands on end."

And they tried it on some pigs, and none of them died.

So they went to the police and said, "I know there are soulless people hanging around the train station in Rome, mumbling nonsense, can you bring one of them?"

According to the Italians they are called "caguz"

And then we found the "Kaghuz" man. They brought us a 39-year-old man with really hopeless schizophrenia. This man we've known for months. He's covered in feces and doesn't speak a word of meaning. This man was taken to the hospital.

After an observation period of two to three weeks, the three psychiatrists laid the man on a treatment table and connected a very small power source to the man's temples.

They thought, "Okay, let's do 55 volts - 0.2 seconds.

Then it wouldn't matter."

and did it

I heard from a direct observer, he told me this story 35 years ago, around the time I was thinking about turning it into my own research project on how to treat depression.

He said, "You remember, this guy wasn't even put to sleep [before the lights were turned on]." "After the [epileptic] grand mal seizure, he got up and looked at the three of them and said, 'You bastard! What the hell are you doing?' (Laughter) I wish I could say it in Italian.

They must have been extremely happy, because they didn't say a single meaningful word during the observation period.

So I turned this guy on again, this time using 110 volts - half a second.

And then, to my surprise, this man started speaking perfectly.

He had a few recurrences, but after a series of treatments, the man was mostly cured.

But of course, I had schizophrenia, so after a few months, the symptoms came back.

They wrote a paper about this, and that's how everyone in the West started using electrical convulsive therapy for people with schizophrenia and severe depression.

For schizophrenia, this didn't do very well, but for depression, it became pretty clear from the '30s to the mid-'40s that electroshock therapy was very, very effective.

Of course, there were no antidepressants at the time, so it became a very popular treatment.

They put me under anesthesia and then they convulsed me, but at the time there was no way to keep the muscles paralyzed.

I had a real big seizure and broke my bones.

Especially old and frail people cannot afford this treatment.

And then, in the late 1950s, so-called muscle relaxants were developed by pharmacologists that could produce EEG-perfect convulsions -- you could see them on the EEG -- but with the slightest twitching in your toes, but without the spasms all over your body.

And this was very, very widely used, very, very helpful.

and in the mid 1960's

The first antidepressants are coming, Trafnil was the first.

In the late '70s and early '80s, other antidepressants came along, and they were very effective.

Patient advocacy groups then started to take a huge backlash against what they saw as electroshock therapy, and the idea of ​​electroshock and its treatments disappeared, but in the last decade it began to be re-evaluated.

There's a reason the re-evaluation has started, because about 10 percent of people with severe depression don't get better with any kind of treatment.

The reason why I am telling you this story now is

I tell you this story because I actually got a call from Richard asking me to do this, and he's asked other speakers to do this, but he asked me to tell you something new that I've never told or written before.

I prepared like this this time

And that's because I'm the man whose life was saved 30 years ago by two courses of long-term electroshock therapy.

let's talk about it

In the 1960s I was married

To say that this was a bad month would be an understatement.

it was a terrible time

Some of you have been divorced, and I'm sure you're familiar with feelings of hostility and anger.

I had a very difficult childhood and adolescence, maybe because I grew up in poverty, if not poverty.

Maybe it's because I grew up in a household where no one spoke English.No one could read or write English.

It could be death, sickness, or many other terrible things.

I tended to be a little depressed

Things got so bad that we hated each other. My depression trickled down over the years.

Eventually, I had to schedule my own surgery for noon or 1:00, because I couldn't get up at 11:00.

Anyone who has experienced depression should know

I couldn't even get out of my futon

A university medical center is a small world, where everyone knows someone else.

My colleagues were very clear about my depression, and my referrals began to drop.

The fewer referrals, the more depressed I was, and I thought, 'Oh my God, I can't work anymore.'

It didn't change much, because I didn't have any patients to take care of anymore.

On the advice of my doctor, I was admitted to the acute psychiatric ward of a university hospital, a colleague of mine whom I had known since I was a medical student.

They say, "Don't worry, it's been six weeks! You'll be back in the operating room soon! Everything will be fine!"

Don't you think it's a joke?

Isn't that a joke

I know a few people who got tenured jobs because of those lies.

(Laughter) I was one of those failures.

But it wasn't that easy, because by the time I got out of the hospital, I couldn't function normally at all.

I can barely see 1.5 meters ahead

If I walk, I will drag my feet and stumble

There were times when I hardly took a bath and didn't even shave my beard.

it's horrible

No one could see anything for me, but it was clear that I needed a long hospital stay, in that dreaded place called a psychiatric hospital.

I was hospitalized in 1973, in the spring of 1973, at the Institute of Living, called "Hartford's Retreat."

Founded in the 18th century, it was the largest mental hospital in Connecticut at the time, aside from a huge public hospital.

and every method they have has been tried

they tried common psychotherapy

I tried every drug available at the time

They had tofranil and other drugs ... melaril and other unknown drugs.

But those methods, except I got jaundiced

Nothing worked, and maybe because I was well known in Connecticut, it was decided that it would be better to have a senior staff meeting.

All senior staff gathered

Later on, I would find out what had happened, and I concluded that there was no way out. This surgeon had shut himself off from the world, was depressed, felt worthless and incompetent, and was already out of his control and obsessed with an obsession with coincidence.

Whenever I saw a certain number, I became very insane and began to perform various rituals.

It was just awful.

Do you have a memory of being obsessed with stepping on lines and walking when you were a child?

Even though I'm an adult, I've performed those rituals, and my head is pounding, and a ferocious terror arises.

You've seen Edvard Munch's painting, The Scream, and every moment was a scream.

It's an impossible condition, which is why they decided there was no cure.

There was no cure. The only thing left was a method that had been developed at Hartford Hospital in the early 1940s. Can you imagine, it was a prefrontal lobotomy.

They decided, again, I didn't know. I found out later that the only treatment they could do was to lobotomy the prefrontal lobe of a 43-year-old man.

There was a resident assigned to me at the hospital

He was 27 years old. He saw me two or three times a week.

Of course, I had been there for about three or four months before that.

He approached the senior staff and they agreed, because he was considered a very talented person at the hospital, and the senior staff thought he had a very bright future.

He was adamant and said, "No, I know my patients better than any of you.

I have met him many times

You've only seen it occasionally and read reports about him, haven't you?

I honestly believe his basic problem stems from just depression, and I think that's where all his obsessions come from.

and of course

You know very well what happens when you do a lobotomy for your prefrontal lobe, and it's going to be somewhere between pretty bad and bad, bad, bad.

For the best, he may no longer have obsessive thoughts, he may not be depressed, but his emotions will be dulled.

A normal outcome would end up being the same as One Flew Over the Cuckoo's Nest, which means that he would spend the rest of his life in a stupor."

And he said, "Can't we just try electroshock therapy?"

Why do you think they approved this? The senior staff courted him

They thought, "Well, let's do a course of 10 electric shocks.

It will take some time, but it won't make much of a difference."

And then they gave me 10 courses. At the time, six to eight sessions was the norm at the beginning. Even now, six to eight sessions.

6th time didn't work 7th time didn't work 8th time didn't work And 9th time

It's great to notice something, but I noticed a change, and by the tenth electric shock, I felt a definite change.

He goes back to his staff, and they approve 10 more runs.

None of the senior staff -- I think there were seven or eight members -- didn't think it was going to work. They thought it was a temporary change.

But hey look, by the 16th, 17th time

I've noticed a definite difference in how I feel.

By the 18th, 19th time, I was able to sleep through the night.

And by the 20th time, I really felt like I could overcome my depression, and I felt strong enough to blow my obsessions out of my own will.

I've come to believe that depression can be blown away.

And I've never forgotten, I'll never forget Standing in the kitchen of the ward It was a Sunday morning in January, 1974. I stood alone in the kitchen and thought, "I have the power to overcome my depression."

It was like the wires that were folded inside my head were disconnected and I was able to think clearly.

but i need a spell

I need words to speak to myself when I'm about to be obsessed

If you're a Gilbert and Sullivan fan, you'll remember "Lady Gore," and you'll remember the character Mad Margaret, and you'll remember her marrying Lord Despard Margadroid.

She goes mad about every five minutes in the show.

Her husband said to her, "Let me tell you a word that will bring you back to your senses, it's 'Basingstoke'."

He says, "Basingstoke." And she says, "Basingstoke!"

But I'm from the Bronx so I can't say "Basingstoke"

but there was a better way

And this is very simple, the word is

"Ah fuck it!"

(laughs) Much better than "Basingstoke", right? At least for me, and this one worked.

It worked so damn well. Whenever I started to have obsessive thoughts, even after 20 ECTs, I muttered, "Ah fuck it."

Things just got better and better, and within three or four months, I was out of the hospital and joined a group of surgeons.

I got to work with people in the community, which is not in New Haven, but it's pretty close, and I was there for three years.

At the end of my third year, I moved back to New Haven, by which time I had remarried.

I brought my wife back to make sure I overcame my depression.

My children also came to live together

After that, I was able to have two more children.

I was able to revive my career, better than it ever was.

I immediately went back to college and started writing a book.

Yes, it's been a wonderful life. Yes, as I said, it was 30 years ago.

I quit being a surgeon about six years ago, and as many of you know, I became a full-time writer.

this is so fun and happy

Sometimes you have to say "Are fuck it"

I feel a little obsessive and depressed at times

I'm not completely free

This spell worked every time

Why did I choose to tell this story, which I have never done before? If you know my work

One is about death and dying, one is about the human body and the human mind, the other is about the mystical thoughts that always live in the mind.

These are all about my own experience

After reading my book -- I've received thousands of letters from people who felt the same way -- you'd think it would be based on the history of my life that I wrote in the book, about the history of my life before, that I was one of those who overcame life's adversity.

It's this experience that allows me to give advice to others about death and dying, to talk about mysticism and the human spirit.

At the same time, I've always felt guilty about it.

I always felt like I was an impostor, because my readers didn't know what I was talking about today.

Some of you who live in New Haven may know this, but it's something the general public doesn't know.

One of the reasons I'm here to talk to you today -- and frankly, I'm selfish -- is that I wanted to open up about myself and tell you that the authors of these books also had problems.

But more than that, I would like to say that many of you in the audience today seem to be under the age of 30, and of course there are many over the age of 30.

To all of you under the age of 30, it seems to me that most of you are, and I say this to all of you: Either you're on the cusp of a huge and interesting career, or you're just at the beginning of it, anything can happen to you.

things change

an accident happened

Something from your childhood will come back to haunt you

These may get you off track

I hope that doesn't happen, but maybe some of you will.

Others will face adversity

Just as I was able to find my way and come back here even in the desolate, heartless state that I was in 1970, even in a situation that a very experienced psychiatrist thought would be an incurable condition.

And if you're over 30, it's not as bad as this, but if you've lived through the hardships of losing everything like I did, or if you've been through a fresh start, it's going to look familiar.

you can recover

be saved and resurrected

Every society that has ever been studied has a theme of resurrection, and this is never just because we have fantasies that resurrection and recovery can happen, but because it does happen.

Perhaps the most well-known subject of resurrection, aside from the religious ones, is the story of the phoenix, the phoenix of ancient stories, which rises from its own ashes every 500 years to live on, living a life more beautiful than before.

thank you Richard

I try to be honest with myself, so before I start speaking, I want to tell you that I'm from South Africa, but one of the most inspiring people in my life passed away a few hours ago.

Nelson Mandela has completed his journey, The Long Road to Freedom.

So I would like to dedicate today's lecture to him.

i grew up in wonder

I grew up among animals

That place is Londolozi Game Reserve in eastern South Africa, full of nature.

My family has run a wildlife zoo here for four generations.

As far as I can remember, my job is to bring visitors out into nature, so I think it's a wonderful twist of fate to bring what I've experienced in nature to this venue and talk about it today.

In Africa, people still sit under star-filled skies and tell stories around campfires, and the stories I'm going to share with you are campfire tales about heroes.

These stories aren't the kind of things you hear in the news. Africa is a harsh place, but they also teach us about a world where people, animals, ecosystems are more interconnected.

When I was nine years old, President Mandela stayed at my house.

I had just been released from 27 years of imprisonment, and it was a time when I was bewildered by the fact that I was suddenly being hailed as a world hero.

Members of the African National Congress thought that by going into hiding, he would be able to hide from the public eye so he could recuperate and recuperate, which was actually a brilliant idea, as the lions terrified the media and the paparazzi.

(Laughter) It was an unforgettable time for me as a child.

I brought breakfast to Mr. Mandela in bed, and then he would walk around the garden in his old workout clothes and slippers.

At night, I would sit with my family around the flickering old-fashioned television set, and I would see a quiet man walking in the garden, surrounded by hundreds and thousands of people.

Mandela brought peace to a divided and violent South Africa, a feat by one man of extraordinary humanity.

Mr Mandela often said that imprisonment gave him the ability to look inward and reflect, and that this gave South Africa the capacity it needed most to achieve peace, reconciliation and integration.

This act of deep generosity has made him a symbol of what is called "ubuntu" in South Africa.

“Ubuntu” means “Because you exist, I exist”

It means that people are kept alive by others.

It's not a new idea or a set of values, but I think it's a valuable statement that should be used as a foothold in today's world.

In fact, the African collective consciousness says that we experience the very core of our humanity through our interactions with others.

The spirit of "Ubuntu" is here too

I want to give everyone here the opportunity to tell you who I really am.

Without you, I'm just a person talking in an empty room. Last week, I practiced by myself, so that's what it felt like.

(Laughter) If Mr. Mandela embodied these values ​​at home and abroad, the person who personally taught me these values ​​would be Solly Morongo.

Solly was born under a tree, 60 kilometers from where I grew up in Mozambique.

He wasn't rich, but he's probably the richest man I've ever met.

Solly grew up tending her father's cattle.

I don't know, but one thing that people who grew up tending cattle have in common is that they're very resourceful.

His first job at the zoo was repairing safari trucks.

I was born and raised in the grasslands, and I have no idea where they got that skill and how they did it so well.

After that, he got a job called the Habitat Team.

It's their job to help preserve the reserve.

Solly repaired roads, tended wetlands, and worked to combat poaching.

One day, while we were outside together, I found tracks that a leopard had walked through.

It was an old track, but intrigued, he began to follow it, and the speed at which it moved over the leopard's tracks was astonishing, and he was a tracker as good as a PhD.

If you drive past Solly anywhere in this reserve and look up in your rearview mirror, you'll see Solly 20 to 50 meters away stopping to see if he's in trouble.

I've only heard him criticized once. One of our clients said, "Solly, your kindness is pathological."

(Laughter) When I started taking people around as a professional guide, Solly was my tracker.

worked together as a team

Our first customer was a charity from the East Coast of the United States, and one of them asked Solly, "Before we go see the lions and leopards, can you show me where you live?"

So I decided to take the group to his house, so I decided to take the group to his house, and at this time Solly's wife was learning English, and the cliché when she opened the door to her house was, "Hello, I love you."

It was, "Welcome, I love you." (Laughter) His house was small and very beautiful.

Solly, who saved my life, has been my hero ever since.

It was a hot day and I was by the river

I couldn't stand the heat anymore, so I took off my shoes, rolled up my trousers, and went into the river.

Solly was on the bank at this time.

The water in the river was running clear on the sand, and we headed upstream against the current.

A few meters ahead, there was a tree sticking out of the bank into the river, and its branches were touching the water, and it was dim.

If this were a horror movie, everyone in the audience would yell, "Don't go there, don't go there."

The first thing you notice when you're attacked by a crocodile is its ferocious bite.

It hit my right leg with a big impact.

I was dragged underwater and turned over, but I reached out and grabbed a branch.

the body was violently shaken

It's a really weird feeling to be eaten.

(Laughter) Solly, who was on the bank, noticed something strange about me.

You came towards me, even at this moment

Crocodile is shaking my body

Then I got bitten again

Blood spread on the surface of the water around me and flowed downstream.

The second time I was bitten, I kicked the alligator up.

When my foot touches the crocodile's throat and my foot comes off

I lifted myself up by a branch, and when I rose from the water and looked down over my shoulder,

My legs below my knees were in indescribably terrible condition.

bones are crooked

meat was stripped

I immediately decided that I would never see these feet again.

When he got out of the water, Solly was in the middle of a deep river.

When he saw my feet, he knew what was going on, and he knew there was a crocodile between me and him, but he didn't hesitate for a second.

I ran across the river

I'm soaked in water up to my waist

When I approached, he grabbed me

I was still in danger

I carried it on my shoulder

Solly is also the owner of superhuman strength.

he turned around and started walking towards the bank

When you drop me off, take off your shirt

They wrapped it around my leg, and they picked me up again and drove me to the car so I could be treated at the hospital.

That's how I survived

Now... (Applause) I don't know how many people you know who are brave enough to go into a river as deep as a crocodile and rescue them.

He's a great example of what I've experienced all over Africa.

In a collectivist society, we find that our own happiness is deeply connected to the happiness of others.

and share the danger and pain

share the joy and sense of accomplishment

We share housing and food

"Ubuntu" teaches us the spirit of generosity and sharing "Ubuntu" teaches us the spirit of generosity and sharing What Solly taught us that day was the essence of these values, the lively and loving actions she showed in every moment.

Now, "ubuntu" is derived from the word for person, and I thought it only applied to people.

But I met this young lady

His name was Elvis

In fact, Solly was her godmother, and the way she walked resembled the hip-shaking dance that Presley used to do.

She was born with severely deformed legs and pelvis.

She came to our district from the eastern reserve and was on the move.

When I first saw Elvis, he looked like he was going to die in a few days.

But then, five years later, we're back in the winter months.

Looking forward to finding her unique footprints in the meadow Looking forward to finding her unique footprints in the meadow

They were like curly braces. When I found a track, I would drop everything and chase after it.

When customers on the safari truck see her, they are overwhelmed with emotion and feel a sense of unity with nature.

And this reminds me that even people who have lived in cities can naturally feel connected to the natural world and animals.

It's amazing that she survived

I once saw this swarm around a small puddle.

There was a hole in the ground

When the older female leader drank the water, she began to perform the beautiful slow movements typical of elephants, swaying gracefully up the steep bank.

Then the rest of the herd turned and followed her.

Young Elvis decided to climb the hill

I leaned my ears forward and tried to climb up, but halfway up my legs couldn't keep up and I fell backwards.

On my second attempt, I still fall backwards halfway up.

When I tried to climb the third time, something amazing happened.

Halfway up the bank, a young teenage elephant came up behind her, pushed her up with his trunk, and carried her to the top of the hill.

It was at this point that I realized that the elephants in the herd actually cared for young Elvis.

The next day, the female leader broke off a branch and put it in her mouth, and she broke off another branch and dropped it on the ground.

All the guides in the area agreed that this herd of elephants was moving slowly for Elvis.

What I've learned from Elvis and her flock has broadened the definition of "ubuntu" I thought it was.In the cathedrals of nature, you can find the most beautiful part of us.

And we can discover our humanity not only through others, but through all living beings.

If there's anything we can learn from Africa, it might be the collectivist way of society.

"ubuntu" was born in Africa, but I think the essence of these values ​​is also born in this venue.

thank you

(Applause) Pat Mitchell: Mr. Boyd, you've known President Mandela since you were little.

So, can I ask you a little more about your feelings?

Boyd Varty: Thank you Pat

It was a relief, actually, because he was suffering from an illness.

I was finally released

Of course it's complicated

But it brings back so many memories, like when I was on The Oprah Winfrey Show, and I asked Oprah what the show was going to be like.

(Laughter) Oprah replied, "Yeah, about you."

That's a lot of humility

(Laughter) He was the father of South Africa, and he showed us the way.

His feat was called the "miracle of Madiba".

When he goes to a rugby match, the South African team wins.

good things happened everywhere

But his magic will never die, and the important thing is that we carry on what he did.

This is what I want to do, and I think people across South Africa feel the same way.

Thank you.

thank you very much

(applause)

I have a question. Do any of you remember the first time you realized that people are going to die?

I remember when I was very young, right after my grandfather passed away, and a few days later, I remember lying in bed in the middle of the night thinking about what had happened.

What is the significance of my grandfather's death?

Where have you gone?

It was as if reality had been engulfed by a gaping hole.

At the same time, a shocking question came to my mind: Will I die one day, just like my grandfather?

Will I be swallowed by the opened hole?

Wouldn't that hole open up under your bed and swallow you while you're sleeping?

Everyone becomes aware of the existence of death as a child.

There are different ways of realizing it, but there are usually stages.

As we grow older, our perception of death changes.

If you dig into the dark corners of your memory, everyone will have a memory like that, just like I felt when my grandfather died and I realized that I was going to die too.

A child's growth like this reflects the evolution of mankind.

As humans evolved, their sense of self and time matured, and they came to realize that they were going to die.Similarly, as humans evolved, the sense of self and time that early humans had matured, and they realized, "I'm going to die someday."

this is our destiny

It's the price that humans have become so smart.

We have no choice but to live with the knowledge that the worst is bound to happen someday. Our future, our hopes, our dreams, our world, has an end.

Each one lives in their own apocalypse.

this is true horror it's horrifying

So everyone looks for a way out

In my case, I asked my mother, when I was about five years old.

When I started asking what would happen to me when I died, the grown-ups around me responded with an awkward, Christian response, a typically British response. The most common line I heard was that Grandpa would "watch over me from heaven" -- and that if I died, I would still ascend to heaven.

not convincing

I used to watch a lot of children's news, and it was the era of space exploration.

I used to watch rockets fly into space all the time.

But none of my late grandfathers or astronauts ever met the dead.

Still, I was afraid of death, and the thought of taking the elevator of existence to see my grandfather was far better than thinking that nothing would swallow me up in my sleep.

So even if it doesn't make sense, I've come to believe it.

This thought process, which I've repeated since I was a child and throughout my adult life, stems from what psychologists call "bias."

Bias is a system of errors that we tend to make. Miscalculations, misjudgments, distortions of reality, wishful thinking. Death biases work in this way: when you're faced with the fact that you're going to die someday, you believe anything that denies it, and that you can actually live forever, even the elevator story.

This is probably the biggest bias

Proven in over 400 studies

The research method is clever and simple

let me explain

First, we divide people who are similar in every way into two groups, and tell one group that they're all going to die one day, and tell the other group nothing, and compare their behavior.

That way, you can observe how awareness of death affects your behavior.

No matter how many times I try, the result is the same: the self-death conscious group is more likely to believe that they can escape death and live forever.

A recent study, for example, divides agnostics, people who don't hold to a particular religious belief, into two groups.

On one side, when I died, on the other —

Ask them to think about times when they are alone

Then it asks again for religious beliefs.

The afterlife group was twice as likely to express faith in God and Christ.

twice as much

All of them were agnostics before the experiment.

But when I gave him the fear of death, he began to turn to Christ.

When we think about death, we find that beliefs are biased regardless of the evidence. This applies not only to religion, but to any belief system that promises immortality, even to nationalism, which promises to make a name for posterity, to have children, to continue to live as part of a larger group.

This is a bias that has been shaped over the course of human history.

The theory underlying the bias in these experiments is called existential threat management theory, and the idea is simple.

The worldviews we've developed, the stories we tell about the world and where we belong, exist to control our fear of death.

The story of immortality can be expressed in thousands of ways, but despite its seeming diversity, I believe there are really only four basic forms.

And I think that basic forms have been repeated throughout history, with only minor variations to reflect the language of each era.

So let me introduce you to the basic format of the story of immortality, along with how it is retold in different cultures and generations, in the language of the times.

The first story is very simple.

The desire to avoid death and the dream of living in the world in our own bodies is the first and simplest story of immortality. Believe it or not, in fact, almost every culture in human history has myths and legends about the elixir of life, the fountain of youth, and the things that give us eternal life.

It was also found in ancient Egypt, Babylon, and India.

Alchemists have written about it in Europe, and people still believe this story, except that it's told in the language of science.

So 100 years ago, when hormones were discovered, there was hope that hormone therapy could cure aging and disease. Now, the promise is stem cells, genetic engineering, nanotechnology.

But the idea that science can stop death just adds another chapter to the story of the drug of immortality, which is as old as civilization.

On the other hand, it's dangerous to bet everything on the idea of ​​finding a potion and living forever.

If you look back in history, people in the past who sought the elixir of immortality all had one thing in common: they died.

So we need a second move, and the second immortal story is perfect for that: Resurrection.

The underlying idea is that you have a body.

Even if we're mortal, even if we're mortal, we can be resurrected and brought back to life.

same as christ

Christ died for three days - in the tomb, then resurrected

The idea that everyone can be resurrected is not only found among Christians, but also among Jews and Muslims.

The belief in resurrection is so deeply ingrained that it's being re-told for the age of science, such as cryopreservation of the human body.

It's about freezing people after they die, thawing them after technology advances, thawing them after technology advances, treating them to revive them, treating them to revive them.

Some believe that an all-knowing and all-powerful God will bring them back to life, while others believe in an all-knowing and all-powerful scientist.

Some people think that the very idea of ​​just coming back to life and coming out of the grave sounds like a B-grade zombie movie.

For such people, their bodies are filthy and unreliable, and they are unlikely to guarantee eternal life. So I cast my hopes on a third, more spiritual story of immortality: the idea that after death, the body is left behind and the "soul" continues to live on.

Most people in the world believe in the existence of the soul, and it's the core tenet of many religions.

But despite the widespread belief in the concept of the soul, both in its current form and in its traditional form, it's being retold in ways that are more suited to the digital age, such as the idea of ​​leaving your body behind and uploading your mind, your essence, your true self to a computer and living in the ether as an avatar.

Some people are skeptical about this because, among scientific evidence, if you look at neuroscience, your mind, your essence, your true self, resides in a specific part of your body, your brain.

Such skeptics find solace in the story of the fourth immortality, a "legacy" to leave behind for posterity, the idea of ​​leaving a living mark on the world, similar to how the great Greek warrior Achilles tried to trade his life for immortality in the Trojan War.

The pursuit of honor is still widely accepted. Honor has become easier in the digital age. Honor has become easier in the digital age.

You don't have to be a great warrior or king or hero

All you need is the internet and videos of cats.

Or some want to continue living as part of the gene pool of a larger population -- a nation, a family, a tribe.

Still, skeptics question whether leaving a "legacy" can really be called immortality.

In the words of Woody Allen, "I would rather live in the hearts of the people.

I want to continue living in my own apartment."

So that's the foundation -- the four stories of immortality -- and then I'm going to explain how these stories have been passed down from generation to generation, reshaped to suit the times.

The reason immortality stories are repeated so similarly in different belief systems is probably because we doubt all immortality stories.

The fact that some believe that an all-knowing and all-powerful God will resurrect mankind, while others believe in all-knowing and all-powerful scientists, shows that neither is certain.

We don't believe in immortality stories because they're confirmed, but because of our biases, and the biases stem from our fear of death.

Here's the question: Is one life only defined by fear of death and denial of death, or can biases be overcome?

Greek philosopher Epicurus said that overcoming is possible.

Epicurus argues that the fear of death is a natural emotion, but not a rational one.

"Death is nothing to us, because it is not with us while we are alive, nor is it with us when it comes."

It's an oft-quoted phrase, but it's hard to really understand and accept, because it's hard to imagine what happens after death.

2,000 years later, another philosopher, Wittgenstein, said, "Death is not an event in life, because we do not live to experience it."

He goes on to say, "In that sense, life never ends."

As a child, my fear of being trapped in nothingness was natural, but irrational, because once I was swallowed by nothingness, I couldn't experience the aftermath.

This bias is hard to overcome because the fear of death is so deeply ingrained. Yet, if we understand that fear itself is not rational and is subconsciously influenced, we can at least minimize the impact of the bias on our lives.

I like to think of life like a book, just as a book is between the front and back covers, so is our life between birth and death. A book has a beginning and an end, but it's filled with distant landscapes, exotic people, and fantastic adventures.

The book has a beginning and an end, but the characters have no end in sight.

The characters only know the moments in the story, even when the book is closed.

So the characters aren't afraid to approach the final page.

John Silver isn't afraid to let readers finish "Treasure Island."

we should be

Imagine your life as a book with a cover, a beginning and an end, birth and death.

All you can know is in between - only moments in life

There's no point in being afraid of what's outside the cover, whether it's before birth or after death.

You don't have to worry about the thickness of the book — you don't have to worry about whether it's a four-panel comic or an epic.

The only thing that matters is that you make a good story.

thank you

(applause)

By 2010, Detroit became a symbol of America's financial collapse.

With housing collapse, auto industry collapse, and a population decline of 25 percent between 2000 and 2010, Detroit is now the number one shrinking city in America by many.

By 2010, I was asked by the Cresge Foundation and the City of Detroit to help drive a city-wide recovery plan and help create a shared vision for the future.

I'm involved as an architect and as a city planner. I've also worked in other controversial cities, like my hometown of Chicago, my current home of Harlem, Washington, D.C., and Newark, New Jersey.

These cities still had many unresolved problems, such as the social problems peculiar to cities and the correction of disparities and discrimination.

And by 2010, well-known design magazines were beginning to cover cities like Detroit in detail, spending entire volumes on the subject of "urban restoration."

A good friend of mine, Fred Bernstein, asked me to interview him for the October issue of Architect Magazine, and when we saw the titles coming out, we both chuckled, "Can this planner save Detroit?"

I'm a little embarrassed and laughing now, because it's obviously ridiculous that one person could be the planner to save a city.

But I also smiled in another way, because I thought there was hope that, with the help of our professionals, the city could emerge from this severe crisis.

So I'd like to spend some time this afternoon talking a little bit about Detroit through what we think is the process of urban restoration and the voices of Detroiters.

Well, this process started in September of 2010.

It was just after a special mayoral election, and it was said that this citywide planning process would invite anxiety and fear among Detroiters.

So we decided to have a lot of community meetings like this to explain the planning process, and people came from all over Detroit, both from stable settlements and from areas where lots of vacant homes were starting to emerge, mostly in the audience.

He represented African-Americans, who made up 82 percent of the city's population at the time.

There was, of course, a question and answer session, and everyone lined up at the microphone to ask a question.

A lot of people walked up to the mic very firmly, folded their arms in front of their chests, and said, "Why are you guys trying to kick me out of the house anyway?"

That's a really powerful question, and it's really compelling when you combine that statement with the history of many African-American families who live in Detroit, and who actually live in cities in the Midwest that look like Detroit.

Many of the residents have told us how they got their homes through their grandparents and great-grandparents, the 16 million people who migrated from the rural South to the industrial cities of the North, as depicted in this Jacob Lawrence painting, "The Great Migration."

They came to Detroit in search of a better life.

A lot of people found jobs in the auto industry, the Ford car, as you can see in this mural by Diego Rivera at the Detroit Institute of Arts.

The result of that labor was the ability to buy a home, and for many, it was a completely new asset and a first-time home-buying community of African-Americans.

Their life in the north went very well for the first 20 years or so, until about 1950, when the city's population peaked at 18 million.

And now to Detroit, the second move begins, people start moving to the suburbs.

Between 1950 and 2000, the administrative district expanded by 30 percent.

But this time, African-Americans were left behind, households and businesses shunning the cities, leaving the cities devoid of jobs and people, and very lonely.

Right around that time, between 1950 and 2000-2010 or so, the city's population fell by 60 percent, and today stands at about 700,000 people.

The people who came to talk to me that night told me what it was like to live in such a declining city.

Many people say that there are very few inhabited houses in their town, and that they can see many abandoned homes from their homes.

80,000 empty homes across Detroit

There are many vacant lots

And we're starting to see illegal activities like illegal dumping. With a population of this magnitude, the cost of water, gas, electricity, etc. is going up.

There are 100,000 empty parcels of land across the city.

I'm going to give you an intuitive yardstick here, because it's a big number, but it's hard to tell until you look at a city map.

The city of Detroit is 139 square miles.

That's the equivalent of Boston San Francisco and Manhattan Island combined.

If you put all the vacant and abandoned land together, about 20 square miles, it's roughly the size of the 22-square-mile Manhattan Island we're on today.

so many vacancies

Now, some of the people in the discussion are also talking about positive things happening in their communities. Many people are banding together to manage some of their vacant lots, start communal fields, and co-manage their communities.

Since 2010, there's been a lot of thinking about how to use vacant land, much of it in what's called community gardens and what's called urban agriculture.

So many people say, "What if we turn all the vacant land into farmland?

That way we can have fresh food and people in Detroit can get jobs."

When I hear stories like this, I imagine the people of the "great migration" crying in their graves, because they struggled from the south to the north to try and make a better life for their families, not to bring their great-grandchildren back to farming, especially because they came to a city that had all the basic ingredients to realize the American dream of having a stable job and a home without even higher education or even primary education.

Now, Detroit is experiencing a third movement, a new force of cultural entrepreneurship.

These same vacant lots and abandoned homes can be viewed as new opportunities for entrepreneurial ideas and profits, and they can move to Detroit like their predecessors, buy land, run successful businesses and restaurants, create successful community activism, and create positive change in their neighborhoods.

Similarly, we're making a conscious effort to bring small manufacturing companies to Detroit.

This is Shinola, a luxury watch and bicycle company, and they say that they chose to move to Detroit because they were drawn to the technological innovations of the global brand Detroit.

They also knew they had access to skilled craftsmen.

Neighborhoods are now co-managed by communities, and cultural entrepreneurs are moving to cities to build companies and move businesses. And in the midst of all this, as you know well, the city of Detroit filed for Chapter 9 bankruptcy just this past July under emergency management.

And so we launched in 2010 and by 2013, we announced a strategic plan called "Detroit, the City of the Future," to build a better, more prosperous and sustainable city, not what it was, but what it could be, new economic growth, new land use, more sustainable and denser neighborhoods, rebuilding infrastructure and urban service systems, and empowering civic leaders to take action and transform.

It had three very important requirements.

One, the cities themselves don't necessarily have to be big, but the economies were just too small.

In Detroit, there are only 27 jobs for every 100 people, unlike Denver or Atlanta or Philadelphia, where there are 35 to 70 jobs for every 100 people.

The second was to admit that in the future, we won't be able to use all this vacant land in the same way as before.

It's not going to be the traditional settlements that it used to be. Detroit's very productive and successful transition to urban farming is not the only way out. What we need to do is look at the fact that there are still a lot of people in the huge vacant lots, and entrepreneurs can use these new people in production and innovation to stabilize the communities that still have about 300,000 residents.

So I proposed one of several neighborhood typologies, called a live-make neighborhood, where people repurpose abandoned buildings and refocus specifically on African-Americans, who make up 82 percent of the population, to start and build companies.

Then they too can do the jobs they used to do outside their homes, become successful industries, own real estate, and become both business owners and land and building owners in the communities in which they live.

We also explored ways to use the land for more productive things besides growing food, such as using lakes and retention ponds to manage floods, to create community amenities and recreational areas, which can actually increase the value of neighborhood real estate.

Alternatively, it can be used as a research site, used to reclaim contaminated soil, or used to generate energy.

Descendants of great immigrants can become precision watchmakers at Shinola, like Willie H., who was in the ad last year, or they can grow businesses that serve companies like Shinola.

The next generation of Detroiters, there's a future for those who are here and those who are yet to come.

Boston Mayor Menino's "Blow Detroit and start over" remarks are too much trouble. (Laughter)

Detroit has very important people, businesses and land, and there's real opportunity there.

Detroit may not be the same as it used to be, but it will never die.

thank you

(applause)

NASA is constantly on the lookout for possible asteroid impacts, scanning the skies nightly with the Pan-STARRS telescope.

Every morning, Pan-STARRS staff will check if there are any abnormalities that remind us of that, but in most cases, they will find that there is no problem.

But on October 19, 2017, Pan-STARRS spotted an object moving rapidly between stars.

By October 22nd, we had enough data to tell us that this was not an object in our solar system.

"Oh my God"

This is my reaction when I got the call, the news that every astronomer who studies the solar system has been waiting for.

I'll tell you how exciting it is.

(Laughter) NASA has been trying to capture an interstellar comet passing through our solar system since the 1970s, but until now, nothing has been detected.

The solar system itself is vast, and the nearest star system is 4.4 light years away, and it takes 50,000 years to receive even a small delivery.

this is a big deal

The interstellar object came from the direction of the constellation Lyra, which is at an oblique angle to the orbital planes of the planets in our solar system, went inside the orbit of Mercury, and made its closest approach to the Sun on September 9.

It wasn't particularly close or unusually close, but

Closer objects are much easier to observe.

Before its discovery, it was closest to Earth on October 14th, at a distance of about 24 million kilometers.

That's pretty close by astronomical standards.

Instead of a cumbersome catalog number, we simply called the object "Rama," after the cylindrical spacecraft that traversed our solar system in Arthur C. Clarke's 1973 science fiction classic.

But that's not the right name either, so we asked two experts in Hawaiian culture, a Polynesian navigator and a linguist, to suggest a name to honor the fact that it was discovered by a telescope in Hawaii.

The name they proposed was "Oumuamua," which means a scout or messenger from the distant past.

There are many reasons why this is an important discovery, but the most important to me is that 'Oumuamua gives us information about the past of our solar system.

The process of forming new solar systems and forming planets must be intense and involved.

The dust around the sun forms a disk that creates giant planets, and as it moves, the excess ice and rock debris is hurled out of the new solar system.

Have you ever seen something that excited you and felt an emotional shudder and a chill run down your spine?

Or have you ever been deeply moved?

i just experienced that

It was the moment when I thought "Wow!"

It really happened that a piece of matter flew in from another star system and came close enough to be observed.

What information would you like to hear from 'Oumuamua, the first visitor from another star system?

I can think of too many to count, but the information you want is one thing, the information you have is one thing.

Within about a week, the brightness had decreased [by a factor of 10].

This is the total amount of time that can be easily investigated.

That's why you have to be smart about the telescope application process, which normally takes months as proposals are peer-reviewed in a fiercely competitive environment.

A "graceful" competition for limited observation time has begun.

No, let's be clear, it was a fierce competition.

I threw everything else away and worked day and night trying to get the proposal to the observatory director flawless.

And the good news is that we've secured observation time.

Now, on a purely personal note, I think the number one piece of information to get is how heavy 'Oumuamua is.

After all, we got pretty close to the Earth, and we only found out about it later.

If the orbit hadn't strayed from Earth, how much of a disaster would have happened?

The energy of the collision is the square of the velocity multiplied by the mass, which depends on size and composition.

So what about 'Oumuamua's size and shape?

This can be seen from the luminosity

If that's confusing, think about comparing the brightness of a firefly in your backyard to an airplane in the distance.

Airplanes are actually much brighter, but they appear faint because they're so far away.

We'd also like to know how reflective the surface of 'Oumuamua is. We don't have a clue, but it's natural to assume that it's similar to the reflectivity of other asteroids and comets in our solar system.

Today, many large telescopes operate in "service mode," which means that we carefully write down all the steps, send them to the operator, and then wait anxiously for the data to come in. And pray to the weather gods.

I don't think many of you have had the experience of working in a job where whether or not there were clouds at night was a crucial question.

But for us, we'll never get another chance.

The weather god was happy, but 'Oumuamua was mean

The luminosity was not constant.

In this video, 'Oumuamua is zipping through the stars.

I am shooting so that it comes to the center

As the telescope tracks 'Oumuamua, the stars move and fade out of frame.

'Oumuamua cycled between dimming and brightening, because sunlight is reflected off four sides of a cuboid.

This extreme change in luminosity led to some incredible conclusions about shape.

As you can see in this rendering, 'Oumuamua is visually very elongated, with an aspect ratio of about 10:1.

Based on its darkness, it is thought to be about [400 meters] long.

There is no object in the solar system that looks like this

Even celestial bodies with an aspect ratio of 5:1 or greater are few and far between.

We don't know why it's shaped like this, but it probably tells the story of how it came into being in its mother star system.

'Oumuamua's brightness varied over a period of 7.34 hours, and we thought,

Some observational groups reported different numbers as more data came in.

Why is it that the more information we have, the more difficult it is to interpret?

It turns out that 'Oumuamua's rotation isn't that simple.

It's shaking like a spinning top

In addition to rotating about the short axis, it also rotates about the long axis, and it also swings up and down.

This energetic, violent movement is almost certainly the result of being violently ejected from its mother star system.

The shape that we infer from the luminosity is highly dependent on how it rotates, so we had to rethink the shape. I think 'Oumuamua is more of a flattened ellipse, like this beautiful visualization by space painter Bill Hartman.

Let's go back to energetics

What is this celestial body made of?

It would be ideal if we could bring a sample of 'Oumuamua to the lab to find out more.

Even a private company can't launch a spacecraft to an object like this in less than a week, forcing astronomers to rely on distant observations.

Observe how light interacts with surfaces

Absorbing some colors creates a chemical fingerprint, but other colors may not be absorbed.

And conversely, certain chemical components can reflect blue or red light more strongly.

In the case of 'Oumuamua, it reflected more of the red color, a color very similar to the organic-rich surface of a comet recently visited by the Rosetta spacecraft.

But not all reddish objects are the same.

In fact, if the surface contains even a tiny amount of iron, it will still appear red, as seen in these images taken by the Cassini spacecraft, such as the dark side of Saturn's moon Iapetus.

Nickel and iron -- basically, meteorites made of metal also look red.

It's not clear what's on the surface, and it's even less clear when it comes to what's inside.

But what's clear is that it's strong enough to rotate on its axis without breaking apart, so it's probably as dense as a rocky asteroid, or maybe even denser, like a metal.

Now, I really want to show you one of these beautiful color photographs taken with a telescope on the ground.

Well, it's certainly not a breathtaking picture.

(Laughter) It's low resolution.

Even with the Hubble Space Telescope, it doesn't get much better.

But the importance of the Hubble telescope data is that it can be observed for up to two-and-a-half months after its discovery, because more information about its orbital position will hopefully help us figure out where 'Oumuamua came from.

So what exactly is 'Oumuamua?

We strongly believe that they are drifting archaeological remnants of the formation of other planetary systems, driftwood in the sky.

Some scientists believe that 'Oumuamua formed very close to a star much denser than the Sun, and is planetary material that was broken apart by the stellar tidal forces early in the history of the stellar system.

On the other hand, some scientists believe that it originated from planetary material that had been shredded apart by a stellar demise shock, perhaps a supernova explosion.

Either way, I think it's naturally formed, but I can't prove that it wasn't created by aliens.

Colors, strange shapes, and bobbing motions can all be described separately.

We don't believe in alien technology, but the obvious experiment is to probe for radio signals.

That's exactly what the "Breakthrough Listen Project" has done, but 'Oumuamua has so far remained completely silent.

Ultimately, there may be a way to fly a spacecraft to Oumuamua and get an answer to this question.

We have the technology to do this, but it will be a long and expensive voyage, and by the time we get there, we'll be so far away from the Sun that maneuvering the final approach orbit will be very difficult.

There's probably much more to learn from 'Oumuamua, and as scientists like myself continue to analyze the data, we may uncover even more surprises.

More importantly, this remote visitor showed that our solar system is not an isolated entity.

We are part of a much larger cosmic environment, and in fact we may be surrounded by celestial bodies from other stars that we don't even know about.

This unexpected gift has raised more questions than it has answered, but it was the first time we had a visitor from another star system.

thank you

(Applause) (Judeider Eisler) Thank you, Karen.

it was a really interesting talk thank you

The story is that this star was discovered at the end of its orbit.

Could future telescopes like the LSST telescope help us find objects like this earlier?

Karen Meech: Yeah, we're going to be able to see a lot of these objects. Ideally, we'll be able to find them as they approach the Sun, because we'd like to have enough time to do a lot of different scientific investigations.

(Judaider) Great. Thank you. Applause again.

(applause)

Einstein said, "I don't think about the future because it's almost here."

that was exactly

Today, I want you to think about what that future looks like.

Over the last 200 years, the world has experienced two major innovations.

The first was the Industrial Revolution, which brought machines, factories, railroads, electricity, and aircraft that changed the way we live.

And then the internet revolution happened, and we had computing power, information networks, open access to information, communication, and it changed our lives again.

Now we're going through another transformation, the Industrial Internet.

Combining intelligent devices with advanced analytical techniques and human creativity

It's a marriage of "human" and "machine", so to speak.

our lives change

Now, in my job, I see first-hand how technology is transforming industries -- sectors that are very relevant to our economy and our livelihoods -- sectors like energy, aviation, transportation and healthcare.

For economists, this is a very rare and very interesting thing, because after all, this is a transformation that has the power of the industrial revolution or more, and before the industrial revolution, there was not much economic growth.

So what is the Industrial Internet?

Industrial machines are getting more electrical sensors, more visual, more auditory, more tactile, more visual, more auditory, more tactile, and they're producing tremendous data.

By sifting through that data with increasingly sophisticated analytical techniques, we're able to drive machines more efficiently in entirely new ways.

And not just individual machines, but also systems like locomotives, fleets, power grids, hospitals.

It's asset optimization, it's system optimization.

Of course, electrical sensors are nothing new, but one thing has changed: the price of sensors has plummeted, and with the advent of cloud computing, the cost of storing and processing data has plummeted.

In the world we're entering, the machines working together are not just intelligent, they're superior.

Machines are self-aware, predictive, reactive, and social at the same time.

Jet engines, locomotives, gas turbines, medical devices communicate seamlessly with each other and with us.

In this world, information itself will also become intelligent, automatically when we need it, without having to search for it.

We're going to incorporate automated visualization, multi-core processor technology, advanced cloud communications, software visualization of machine functions -- a software-driven machine infrastructure that separates the machine software from the hardware so that we can remotely and automatically monitor and improve industrial equipment.

Why is this important?

First of all, they already enable proactive condition-based maintenance, which means that you know when something is about to break down, and you can fix it so you don't waste time on regular maintenance.

This means no unplanned downtime, no power outages, no flight delays.

Here are just a few examples of these remarkable machines in action, some seemingly trivial, some obviously profound, but all of them have a big impact.

Starting with the aviation industry

Currently 10% of flight cancellations and delays are currently 10% of flight cancellations and delays are unplanned due to unforeseen obstacles

This is due to maintenance work.

This costs the global aviation industry an estimated $8 billion each year. Not surprisingly, it leaves us feeling stressed, inconvenienced, unable to attend meetings, and just sitting helplessly in terminals.

What can you do with the Industrial Internet?

We've developed a preventative maintenance program that can be implemented on any aircraft.

It learns on its own and can anticipate problems that human operators miss.

During the flight, the aircraft communicates with engineers on the ground.

By the time we land, our technicians will know what to maintain.

With this system, in the United States alone, more than 60,000 delays and cancellations can be prevented each year, and seven million passengers can reach their destinations on time.

Next is medical

Nurses now spend, on average, 21 minutes per shift looking for medical equipment.

It doesn't seem like a big deal, but it means that I'm spending less time with my patients.

St. Luke's Hospital in Houston, Texas, used Industrial Internet technology to electronically monitor and connect patients, staff and medical equipment, and cut the time out of bed by an hour.

Considering the surgery, an hour is a long time, isn't it?

So we can treat more patients and save more lives.

Another medical center in Washington state is piloting an application that can analyze medical images from scanners and MRIs in the cloud, providing better diagnoses at lower cost.

Let's say you have a patient here who's seriously injured, and you need help from multiple specialists: a neurologist, a cardiologist, a surgeon.

If they could all see the scans on the spot at the same time, we could provide better care faster.

These will lead to better health care, which in turn will bring significant economic benefits.

Eliminating just 1 percent of current inefficiencies could save over $600 billion in spending across the global healthcare industry. Over $600 billion in savings across the global healthcare industry.

Similar developments are happening in the energy industry, including renewable energy.

Wind farms will be equipped with new remote monitoring and analytics capabilities that will allow wind turbines to share information with each other and adjust blade orientation to match wind direction to increase overall efficiency of power generation, resulting in less than five cents per kilowatt-hour of power generation.

Ten years ago, the cost of power generation was 30 cents, about six times what it is today.

There are too many examples like this, because industrial data is growing exponentially.

By 2020 they will be over 50% of all digital information.

But it's not just about data. So let's shift perspective and talk about how it impacts the way we work every day. This new innovation is bringing new tools and applications to help us work together smarter and faster.

For example, a field engineer at a wind farm can see which turbine needs repair just by looking at his mobile device.

I know the problem beforehand, so I have the necessary spare parts.

If there's an unforeseen problem, I can use the same mobile device to contact my colleagues in the service center, show them what they see, and send them the data they need to make a diagnosis.

These interactions are recorded and stored in a searchable database.

Think about it for a minute, this is an important point.

This new wave of innovation will fundamentally change the way we work.

I'm sure you're worried about the impact this innovation will have on your work.

Unemployment is already high, and people fear that innovation will take jobs.

innovation is disruptive

But let me emphasize two points here.

One, we've already survived the mechanization of agriculture, the automation of industry, we've created more jobs, and innovation is growth in the first place.

products become more affordable

Created new demand and jobs

The second concern is that jobs in the future will be limited to engineers, data scientists, and other high-level professionals.

As an economist, that scares me too.

But think about it, in the same way that a child can easily use an iPad, an industrial application should be easy to use for any level of worker.

The workers of the future will be Iron Man, not Chaplin's Modern Times.

And certainly, there will be new high-level professions. Digital and mechanical engineers who understand both machines and data. Managers who understand their industry and their analytics will reinvent technology and reshape their business.

Now take a step back

See the big picture

Some people say that today's innovation is all about social media and silly games, and none of the transformational forces of the Industrial Revolution.

The innovation that drives growth is long gone.

Every time I hear this, I wonder if there were people like that even in the Stone Age, sitting around a campfire and gazing absent-mindedly -- cavemen watching other cavemen rolling stone rings up and down hills and saying, "Oh, those rings are funny, but they're nothing compared to fire.

The great discovery is over."

(Laughter) This technological change has the greatest transformative power ever.It has the greatest transformative power ever.

Human creativity and innovation have always been our driving force.

create jobs

boost living standards

making our lives healthier and more rewarding

So is this innovation that's starting to take the industry by storm.

In the United States alone, the Industrial Internet will boost average incomes by 25 to 40 percent over the next 15 years, adding 10 to 15 trillion dollars to global GDP at a rate not seen in some time.

That's about the size of the entire American economy today.

But this is not the promised future.

We're still in the early stages of the transformation, and there will be obstacles to break, barriers to overcome.

need to invest in new technology

Organizations and management practices also have to adapt.

Robust cybersecurity must protect sensitive information and intellectual property and protect critical infrastructure from cyberattacks.

Education must change so that students can acquire the right skills.

It won't be easy, but it's worth it

The economic challenges we face are daunting, but I've been on the ground watching how people and great machines are being connected to each other, and how they're transforming hospitals, airports, and power plants. I'm not just optimistic, I'm passionate.

This new innovation is just around the corner

So let's think about the future, the future that's right there

thank you

(applause)

"I felt the funeral in my head The mourners walked to and fro and walked and at last I lost consciousness When the mourners took their seats And the mourning thundered and thundered like a drum And at last my heart froze And then the coffin was lifted Across my soul My usual lead shoes clattered past And the bells started ringing all around As if heaven had become a bell And existence was an ear. It felt like I and the silence were stricken strangers here And then the slab of reason broke and I fell down and down And each time I fell I hit another world until I didn't know anything. We understand depression through metaphors.

Emily Dickinson put it into words in poetry, and Goya put it into painting.

I think most of the purpose of art is to paint something symbolic like this.

In my case, I've always thought of myself as a tough person, someone who would definitely survive being sent to a concentration camp or something.

What I have experienced since 1991

It all started with the death of my mother.

But three years later, in 1994, I realized that I had lost interest in almost everything.

I didn't want to do anything I used to want to do, and I didn't even know why.

The opposite of depression is vitality, not happiness.

And I think that vitality is what disappeared from me at the time.

Everything I had to do in front of me seemed like a big job.

When I got home, the red light on my answering machine was flashing. Instead of getting excited about messages from my friends, I thought, "How many people do I have to answer?"

Other times, I'm going to have lunch, but I think I'm going to have to take the food out, put it on a plate, cut it with a knife, chew it up, swallow it, and it feels like the weight of a cross.

One of the reasons why discussions about depression don't work is that people perceive them as silly.

I know how stupid it actually is

Ordinary people know it's normal to listen to voicemail, get lunch, take a shower, and walk out the front door.

At this rate, I had less and less to do, less thinking, less feeling.

I think I was close to nothing

Anxiety strikes there

If you asked me to stay depressed for the rest of the next month, I would say, "If it ends in November, you can do it." (Taken in October)

But if someone told me, "Keep me super anxious for the rest of the next month," I'd cut my wrists before I could do it.

I always felt that when I walked, I slipped and stumbled, and the ground felt like it was pushing me down, and it wasn't just a moment, but it felt like it lasted for half a year.

It's crazy to have anxiety all the time, but you don't even know what your anxiety is about.

That's when I started to think that life was just too hard, and the only reason I didn't kill myself was because I didn't want to make other people sad.

I woke up one day and thought I might have had a stroke, because I was lying in bed, frozen, and I was looking at the phone and thinking, "Something's wrong, I need to call for help."

Four hours of lying and staring at the phone, the phone finally rang, and I managed to pick it up, and it was from my dad.

Medication and therapy began the next day.

And I started asking myself these terrifying questions: If I wasn't tough enough to survive in a concentration camp, who am I?

If I take this medicine, will I be more like myself? Or will he become someone else?

What would happen to me if I were to be a different person?

I had two strengths in starting this fight.

First of all, objectively speaking, I was living a good life, and I knew that once I recovered, I would have a life that was worth living.

The other was access to good treatment.

And yet, the symptoms kept coming back and coming and coming and coming and coming and coming back until I finally realized that I was going to have to rely on medication and therapy for the rest of my life.

So I thought, "Is this a chemical problem or a psychological problem?

Which is more useful, chemotherapy or psychotherapy? "and

I don't know which one is more effective

And what I realized was that, in fact, neither discipline could fully understand this disease.

But both chemotherapy and psychotherapy have a role to play. What I've also come to realize is that depression is woven deep within us, inseparable from our personality and personality.

Modern depression treatment is a terrible situation.

not effective

very expensive

It also comes with countless side effects.

really the worst

But I'm grateful to be able to live in the present, because 50 years ago, it would have been an almost hopeless condition.

So I hope that 50 years from now, people will hear about the treatments I'm receiving and be amazed that I've endured such primitive science.

depression is a love flaw

If a married man thinks, "If my wife dies, I'll look elsewhere," that's a far cry from the love we believe in.

There is no such thing as a love that never loses, and the fear of despair is the driving force behind deeper love.

There are three things that people tend to confuse: depression, anguish, and sadness.

Suffering is a clear response

Let's say you've lost someone and feel extremely unhappy, but six months later, if you're still feeling deep grief, but you're slowly getting back to your old life, then that's anguish.

If you've lost someone in a tragic way, and you're so depressed that six months later you can't function in your daily life, it's likely that you have depression induced by the tragic circumstances.

It has a lot to do with what trajectory you follow.

Many people think that depression is just being sad.

But in reality, it's more grief than you can imagine, too much suffering, and in the distance it stems from too little cause.

To understand depression, I began interviewing people who had experienced it, and what I found was that even people with relatively mild depression on the surface were severely affected by the disease.

On the other hand, as he describes it, even when he sounds like he's suffering from severe depression, sometimes we catch glimpses of a good life in between dark episodes.

So next we looked at the factors that make some people more resilient than others.

What are the mechanisms that keep people alive? and

To find out, I interviewed all kinds of people who struggled with depression.

The first person I interviewed described depression as a slowly dying disease, and it's good to hear this early on, because slowly dying is actually leading to death, which is a big deal.

It's a global epidemic that kills millions of people every day.

One of the people I talked to, and I tried to understand, was a dear friend, an old friend, who had a psychotic episode during her freshman year in college that left her severely depressed.

It was bipolar disorder, then known as manic depression.

After years of lithium, she was showing signs of recovery, so she finally turned off the lithium, and when she saw how she was doing, she had another psychosis, the worst depression I'd ever seen.

When I asked her about those days years later -- she's a poet and psychotherapist named Maggie Robbins -- when I interviewed her, she said, "I kept singing 'Where Have All the Flowers Gone' in my head to calm me down.

I really wanted to erase the voice in my heart that said, "You're worthless, you don't need anyone.

It wasn't even worth living." That's when I seriously started thinking about suicide."

Depression isn't about looking at the world with a gray veil and feeling bad about it.

I feel like the veil has been lifted, the veil of happiness, and I take what I see honestly.

It's much easier to treat schizophrenics, because they have delusions and other disorders that you just have to get rid of.

But even the truth can deceive

I get stuck with this thought, "But even the truth deceives."

In my conversations with depressed patients, I found that they have a lot of delusional perception.

For those who say, "Nobody loves me"

Say, "I love you, your wife loves you, and so does your mother."

For most people, this is an immediate response.

But people with depression also say, "No matter what we do, we're all going to die."

Or, "There's no such thing as a true exchange between two people.

Each spirit never leaves the body."

In such a case, please reply, "You're right, but the question now is what to eat for breakfast."

(Laughter) A lot of the time, what they're trying to convey is not the morbidity, but the essence of things, and it's really amazing how many of us know about these existential questions, but we don't really care.

There's one study that I particularly like. You put people in groups who are depressed and people who aren't, and ask them to play a video game for an hour. After an hour, ask them how many little monsters they think they've killed.

A group of people with depression usually get this number right, with a margin of error of 10 percent, while the other group overestimate by 15 to 20 times and say they killed a little monster (Laughter).

When I mentioned that I was writing a book about my own experiences with depression, many people told me that it would be very difficult for people to find out about this confession.

I was asked, "Did the way people talk to you change?"

My answer was, "Of course it has changed.

People started talking about their experiences, or their sister's, sometimes their friend's.

My world changed when I learned that depression is a family secret that anyone can have."

A few years ago, I attended a conference, and on Friday, the first day of a three-day conference, one of the participants came up to me and said, "I suffer from depression, and I'm a little ashamed of myself, but I'm still on medication, and I want your opinion."

I advised her as much as I could

She said, "My husband has no understanding of this disease.

I'm the type who doesn't understand depression, so please keep this a secret."

I replied, "Okay, I will."

It was Sunday, the last day of the conference, and her husband came up to me and said, "I know my wife will be disappointed to hear this, but I'm suffering from depression and I'm on medication, so I'd like to hear your opinion."

The couple hid the same drug in different places in the same bedroom.

At that time, I told him that there might be a communication problem between the couple.

(Laughter) At the same time, what surprised me was the messy nature of mutual secrecy.

depression is really exhausting

It's taking up time, it's draining your energy, and you can't talk to anyone.

So I started thinking about ways to improve their mental state.

First, I thought about it from a medical point of view.

I thought that certain types of therapy would work, especially medication, certain types of psychotherapy, possibly electroconvulsive therapy, but other treatments would not work.

But what I noticed

If you tell people with brain tumors that standing on your head for 20 minutes each morning makes them feel better, it seems that sometimes they feel better.

But if you tell someone who's depressed that standing on their hands for 20 minutes every day will make them feel better, it really works, because depression is an emotional disease.

So I became open to a myriad of alternative treatment options.

And I received hundreds of letters telling me how it worked.

Today, on the side of the stage before my talk, I was asked about the benefits of meditation.

One of my favorite letters was sent to me by a woman who told me that after trying everything from therapy to medication, she finally found a solution, and she wanted me to introduce her to you.

(Laughter) They even sent me some of the real thing. (Laughter)

By the way, I'm not wearing it right now.

I recommended that she look up the section on obsessive-compulsive disorder in the Diagnostic and Statistical Guide to Mental Illness.

When I researched alternative treatments, I was able to learn about other treatments as well.

For example, tribal exorcism in Senegal uses sheep's blood. I won't go into details here, but a few years later, when I was working on another project in Rwanda, I happened to tell another person about my experience in Senegal, and he said, "That's the way West Africa does it. We in East Africa have completely different rituals, but we have some rituals in common, and the exorcism just now is similar."

I was like, "Wow," and he continued, "I've had a lot of problems with Western mental health workers, especially those who came right after the Rwandan genocide."

When I asked, "What is your problem?"

He said, "Actually, they do strange things.

I'm not going out to the sun where it should make me feel better

I don't use drums or music to uplift my friends

the whole community does nothing

It doesn't even try to drive out the depression that should be an invading spirit

Instead, they take everyone all at once into a dingy, cramped room and talk for an hour about their harrowing experiences."

(Laughter) (Applause) He said, "We got them back."

(Laughter) Let's take a look at another extreme, alternative therapy, and I'm going to tell you about Frank Rusakov.

Frank Rusakov had the worst depression I've ever known.

he was always depressed

During the time I met him, he received electroshock therapy every month.

Incoherent for a week after treatment

A week later, I'm back to my senses.

Then the next week the symptoms get worse.

So I'm going to get electroshock therapy again.

When he met me, he said, 'I can't bear to spend my days like this every week.

I can't go on like this

But before that, I heard that Massachusetts General Hospital is doing neurosurgery called a cingulate gyrus resection, and I'd like to try that."

When I heard this, I remember being impressed by the positivity that, in a corner of his mind, someone like him, who had been through so many unpleasant experiences with various treatments, was inspired to try something else.

He had a cingulate resection, and the surgery was a huge success.

now he is one of my friends

I have a beautiful wife and two beautiful children.

I got a letter from him the Christmas after my surgery, and it said, "This year my dad gave me two gifts. First, an electric CD case from Sharper Image.

The other was a picture of my grandmother who committed suicide.

I started crying as I opened the package, and my mother came up to me and said, 'Are you crying because you have relatives you've never met? Even as I was writing to you, I couldn't stop crying, saying, 'It's because your grandmother had the same disease as I did.'

But it's not because I'm sad, I'm overwhelmed, because I could have killed myself, but thanks to the support of my parents and doctors, I had the surgery.

I am grateful that I survived.

We live in good times, even if it doesn't seem like it."

I noticed that depression is widely perceived as a middle-class problem in modern Western society, so I looked at how it was treated in other settings, and one of the things that really intrigued me was depression among the poor.

So I decided to look at how poor people are related to depression.

And what they found was that poor people, for the most part, didn't get treatment for depression.

Because depression is the result of a genetic predisposition, its population proportions should be evenly distributed across environments, and the conditions that trigger depression should be more severe in people living in poverty.

But what's clear here is that if someone who has a really comfortable life feels miserable all the time, they're like, "Why am I feeling this way?

I must have suffered from depression."

and seek a cure

But if you live a perfectly miserable life and feel miserable all the time, those who think it's justified won't say, "I need to fix this miserable feeling."

What's epidemic here in America is that depression among the poor goes unnoticed, goes untreated, goes unaddressed, and I think it's a great tragedy.

It was there that I met a researcher who was doing a research project in the slums of Washington, D.C., where she was doing a six-month trial of treatment if she found depression in female patients who came to see her with other health problems.

One of my patients, a woman named Laurie, came to see me and told me this story.

By the way, there are seven Raleighs

I'm a mother with a child. "I used to have a job, but I quit because I can't go out.

And I can't find the words to say to my children.

In the morning, after everyone has gone out, I look forward to getting back in bed and covering myself with the futon. At 3:00, the kids are back, and I think it's too early."

She continued, "I take a lot of Tylenol, but I'll take anything to sleep better.

my husband says i'm stupid and ugly

I want to escape from this pain

She was the subject of a therapeutic experiment, and when I visited six months later for an interview, she had started working as a childminder for children whose parents were in the United States Navy, and she had left her abusive husband.

"In my new home, I've built a room for boys and girls, but at night, they all sleep in my bed, and we do all sorts of things together, from homework.

One of the children wants to be a pastor, the other is a firefighter, and one of the girls wants to be a lawyer.

Children don't cry like they used to, they don't fight like they used to

all i need now is them

A lot of things have improved, the way we dress, the way we feel, the way we behave.

I don't go out feeling anxious anymore, and I don't think the bad feelings will come back.If it wasn't for Miranda-sensei, I'd still stay at home covered in my futon, and maybe I wouldn't be alive.

I asked God to send an angel, so it seems that he heard my wish."

I was so moved by her experience that I decided I wanted to write about it, not only for the book I was writing at the time, but also for an article commissioned by The New York Times Magazine on depression among the poor.

I took the finished article, and the editor summoned me and said, "I can't make it into an article."

When I asked "Why?"

"This story is hard to believe

People on the fringes of society could get a few months of treatment and get a job at Morgan Stanley.

Impossible

I've never heard anything like this before."

So I said, "Even you've never heard of it, so it might be newsworthy."

(Laughter) (Applause) "You run a news magazine."

After repeated negotiations, it was finally decided to publish

But what I've heard a lot in this process is that people hate the idea of ​​treating depression, because treating so many people in poor neighborhoods would change the lives of the people who are using them in a bad way.

There's a false moral imperative around us that treats depression, medications, etc., are shams and contrary to the order of nature.

seems very misplaced to me

It's natural for teeth to fall out, but I don't think anyone would blame it on toothpaste, at least not around me.

When you say things like, "Isn't depression something that people should experience?

Are you suffering from depression?

Isn't depression also a personality? I hear a voice saying

My answer to that is, "Mood is malleable."

All the emotions we feel, sadness, fear, joy, joy, are very valuable.

Problematic depression occurs when the balance is disturbed.

you will not be able to adapt properly

People who come to me say, "If I just put up with it for another year, I feel like I can get over it."

I answer, "Maybe, but I'll never be 37 again.

Life is short, are you going to waste a year?

Please think about it."

I think it's the same in many languages, not just English, but I find the word "depression" very poorly worded, because it's used when a child is sad because it's raining on his birthday, or when someone is in agony about committing suicide.

People ask me, "Is depression just an extension of normal sadness?"

My answer is, "In a way, it's an extension of my usual grief.

There's a certain degree of continuity. The analogy for this continuity is, if you have a little bit of rust between the iron fences outside your house, you have to sand it off and paint it, but what happens to your house if you don't take care of it for 100 years? Only rubble and red rust

You know, this red rust is the problem, and it's the problem that we have to deal with.

People might ask, "Are you happy with your antidepressants?"

drugs don't make me happy

But I don't feel sad about having lunch, I don't feel sad when I hear my answering machine at home, I don't feel sad about taking a shower

In fact, I feel more grief.

What hurts me now is professional disappointment, like relationship issues, global warming, and so on.

These are the things I care about

So the question is, what is the conclusion?

How do people who struggle with severe depression and still have good days cope?

What is the mechanism for overcoming this? Etc

What I've learned over time is that people who deny their past, say, "I was depressed a long time ago, and I don't want to think about it, I don't want to remember it, I just want to focus on the rest of my life." Ironically, these people become slaves to depression.

Keeping depression out helps it

Hiding makes you grow

On the other hand, the people who do well are the people who don't turn their backs on the fact that they have depression.

People who accept their depression are resilient

Frank Rusakov said, "I don't want to repeat this experience, but strangely enough, I'm filled with gratitude for what I've had.

I am grateful for the experience of being hospitalized 40 times

I learned a lot about love, and about my relationship with my parents, my doctor, and I will never forget this precious treasure."

And Maggie Robbins said, "When I was volunteering at an AIDS clinic, I felt like I was the only one who was doing long, one-sided conversations, and the patients were completely unresponsive, unfriendly, and not very approachable.

Because if I tell you more, I'm not with AIDS and I'm not dying like them, and they're with AIDS and I'm dying.

Great value for what we need

So I decided to give you everything I needed."

Valuing depression doesn't prevent relapses, but it may help you spot the signs of relapses, and make it easier to accept relapses.

The important thing is to find great meaning in the depression you've suffered from, rather than be content with having had a good experience.

The important thing is to explore what it means, to think deeply about it, and when it does come back, to be ready to say, "I'm going through hell, but I'm going to learn something."

I learned from my own depression how emotions can be bloated, how delusions can overwhelm truth, and it's this experience that allowed me to experience positive emotions in a stronger, more targeted way.

The opposite of depression is not happiness, it's vitality.In recent years, my life has been vibrant, even on sad days.

I felt that funeral in my head As I sat next to the cross at the end of the world, I realized something inside of me Awakened my soul I couldn't have done it if hell hadn't suddenly come that day 20 years ago.

I hate my depression and I don't want it to happen again, but I've found a way to cherish it.

The reason I love depression is because it taught me how to find joy

And sometimes bravely, sometimes overcoming hesitation, we are forced to make such decisions day by day.

I think this is the greatest joy

thank you

(applause)

Nine years ago, I was helping the US government rebuild its electrical infrastructure in Iraq.

I worked there because I believed that technology could change people's lives.

One afternoon at the Al-Rashid Hotel in Baghdad, I was having tea with the owner, and he said to me, "You Americans can fly people to the moon, but I can't even turn on the lights when I get home tonight."

At this time, the U.S. government was spending more than $2 billion to rebuild its electrical infrastructure.

How do we make sure technology reaches users?

How can I reach them in a useful way?

That's what my colleagues and I were thinking at D-Rev

D-Rev is an abbreviation for Design Revolution.

Four years ago, I took over this organization, which was focused on building products that were actually in the hands of users, and not just users, but people who lived on less than four dollars a day.

One of the things that we've been working on lately is medical devices, but what you might not know is that this has something in common with the Iraqi power grid, which has some common characteristics.

It's that even though we have advanced technology, it's not reaching the people who need it most.

I'm going to tell you about one of the projects that we're working on right now, the ReMotion Knee, an artificial limb for people who have lost their thighs.

This project was inspired by Jaipur Foot, the world's largest prosthesis provider, and one day in the Bay Area, he said, "I want better prostheses." One day in the Bay Area, he said, "I want better prostheses."

If you're living on less than four dollars a day and you've had your leg amputated, you've usually lost your leg in a car accident.

People think it's caused by landmines, but it's actually a car accident.

You're walking along the side of the road and you're run over by a truck Or you're running late for work trying to jump on a fast-moving train and your trouser leg gets stuck

If you don't have enough money, the reality is, just like this young man named Kamal here, you don't have money, so you have to walk around with a bamboo cane.

How big a problem is this?

There are over 3 million amputees each year and they need new legs.

What options do you have?

This is a top-of-the-line prosthetic leg, a so-called high-tech prosthetic leg.

Built-in microprocessor

You can do most things with it, but it costs 20,000 dollars. Who would wear this? U.S. veterans who have come back from Afghanistan or Iraq.

This is a low cost titanium prosthesis

It's a complex prosthetic leg, a four-axis structure that's more like a real human foot.

But at $1,400, people like Kamal still can't afford it.

Finally, this is the cheapest prosthetic leg.

This is a prosthetic leg specifically designed for the poor.

Affordable but lacks functionality

Structurally, it's uniaxial, similar to a door hinge.

you know how unstable

Jaipur Foot uses this type of thing, and I started looking for a good prosthetic leg. Now, I hope you can understand what a prosthetic leg is, because if I show you all the different prosthetic legs, you don't get the whole picture.

There's a socket at the top that you put over the rest of your limb, but everyone's foot is different.

And then there's the knee, and the knee joint is uniaxial. You can see how it rotates.

We've developed a prosthetic leg, a complex prosthetic leg that moves like a real human leg, mimics the way a human walks, and it costs 80 dollars.

(Applause) But when you have a great invention or a great design, the question is how do you get it to the people who need it most?

How can we guarantee a better life for them?

So at D-Rev, we started another project, and we focused on three things, and we believe that this will bring technology to customers, users, people who need prosthetic legs.

The first is that the product has to be world class.

Must be equal to or better than the best products on the market

Regardless of your income level, you want the most beautiful and best product in front of you.

I'm going to show you a video of a man named Ash, you can see him walking.

He's wearing a prosthesis with the same system as the uniaxial prosthesis you see here.

he is doing a 10 meter walk test

You'll find him unsteady and distressed as he walks.

I don't know for sure, but it seems to me that it's nerve-wracking in order not to fall.

Now it's Kamal's video

You remember Kamal from earlier, he was holding a bamboo cane.

He's using one of our old prostheses.

you'll find him much more stable

So world class isn't just about technical performance,

so is human performance

Most of the medical devices that we've seen are really made for Westerners, wealthy people in the West.

But the reality is that our users, our customers, sit cross-legged

squat or kneel and pray

We designed our prosthesis to give you the widest range of motion of any prosthesis on the market.

So the next point we've learned, and the next point that follows from what we've just talked about, is that the product should be user-centric.

At D-Rev, we take it one step further and say we should be user-obsessed.

It's not just about the end user, but everyone involved in the project, including the prosthetist who puts the prosthesis on.

What is a local market like?

How do all these parts get to the hospital?

Is your supply chain delivering everything on time?

All of these elements must be considered and systematically worked to get the product to the end user before they can be used.

Here are some of the improvements that were made based on the early Jaipur Nee, right here.

(click) Did you notice anything?

You will hear a click

We've seen users actually adjust this

Can you see the black strip right here?

This is a homemade noise dampener

We've seen users adjust this in other ways

You can see the amputee here, he's bandaged around his leg.

made it look better

If you look at your knees, do you see horns?

If you're wearing trousers, a skirt, a sari, it's pretty obvious that you're wearing a prosthetic limb, and in a society where disability is considered shameful, we care a lot about these things.

So let me show you the improvements we made

We did a lot of iterations on this and other issues.

But here comes version 3 ReMotion Knee, and if you look here, you'll see that there's noise dampening, it's quiet.

Other than that, make the outer shape smooth.

made thinner

It's invisible, but it's designed for mass production.

This brings us to the last point

We really believe that in order to get as many products to users as they need, we need to be market driven. Market driven means products are sold.

It's not a donation. It's not about getting a lot of subsidies.

Our products must be made to provide value to the end user

It must also be made very affordable.

But a product that's valuable to the customer is used by the customer, and using it has a big impact.

As designers we are responsible to our customers

Centralized manufacturing, consistent quality control, and a price of $80, including margin.

And now those profit margins are crucial. If we're going to reach all the people in need around the world with prosthetic limbs, they need to be economically sustainable.

Let's talk about our current situation here

We've fitted more than 5,000 amputees with prosthetic limbs, and the big indicator we're heading towards is, of course, can we improve lives? about it

So the criteria is that the prosthesis has been worn for at least six months.

The industry average is about 65%

We're 79% and we want it to be even higher.

Our prostheses are now used in 12 countries.

As a target to be achieved in the next three years

We're going to double our influence in 2015, and we're going to double every year after that.

But we faced a new wall: the number of armed prosthetists who could wear prostheses.

So I'd like to end with a story about Prinima.

Prinima was 18 years old when she lost her leg in a car accident. She took a 12-hour train ride to come to the clinic to have a prosthesis fitted. From all the amputees who wear our prostheses, we as designers have a huge impact.

She said, "Now that I can walk again, I can go back to school and finish my studies."

To me, she represents the next generation of engineers, the next generation of engineers who can solve problems and deliver meaningful technology to our users.

thank you

(applause)

This is the fifth time I've been on this beach, and as I look out onto the distant horizon on the coast of Cuba, I'm once again convinced that I can swim across this vast, dangerous ocean.

Not only in my own four attempts, but in all the world's top swimmers who have been trying since 1950, no one has yet achieved it.

My team is proud of our four attempts,

We have a support team of about 30 people.

My leader is my best friend, Bonnie, who keeps me strong, who awakens the faint fighting spirit I thought I'd lost in that ocean where I've been swimming for hours and days.

The shark expert on the team is the best in the world.

The box jellyfish, which has the world's most poisonous poison, makes its home in this area, and nearly died in a previous attempt.

The environment itself is harsh, let alone over 100 miles of distance, but crossing oceans means tidal currents, whirlpools and even the most unpredictable thing on earth, the Gulf Stream.

By the way, it's funny, before a challenge like this, journalists and other people often ask me, "Are you going with the boat or the supporters?"

What are you imagining?

Do you think that you're going to look at the stars by yourself, change the direction of your swim, put a martial arts knife in your mouth, catch a fish, skin it, eat its meat, pull a desalination desalinator, swim, and make drinking water?

(Laughter) Of course I'll bring the team (Laughter)

The team is a group of brave fellow professionals who are groundbreaking problems and making scientific discoveries, just like any of the world's most famous expeditions.

I've come a long way with them

Ever since ancient Greece, people have been debating what adventure means.

The purpose of life is not the goal Isn't it the way?

This road is really thrilling

We haven't reached the other side of the river yet, but our pride and determination to do so is unwavering.

When I turned 60, I didn't lose sight of my dreams.In my 20s, I challenged myself, dreamed about it, and envisioned it.

I thought of the strait between Cuba and Florida, which is one of the hottest spots in the world today.

So deeply rooted in my heart

I didn't do it because I wanted to boast that when I turned 60, I would be the first to do something in the sport.

Of course there was

I thought of a life that had a deeper purpose than that, and that was the rest of my life.

In fact, we are all heading towards the end of our lives.

what are you going to do there

What should I do so that I won't regret it later when I look back?

During my training last year, I was constantly reminded of a quote from Theodore Roosevelt that fits this perfectly.

These are the words

“It is all right to sit in a comfortable chair and criticize what others are doing, or just stand by and watch, but those who have courage actually participate, get hurt, get muddy, and fail countless times, but live bravely without fear or hesitation.”

Of course I wanted to swim all the way to the other shore

Because that's what it's all about, and it's actually -- this year, the destination was more beautiful than the journey.

(Laughter) (Applause) But the trip itself was very worth it.

At this point, this summer, a scientist, a sports scientist, a training expert, a neurologist, and even my team's Bonnie, told me this was impossible.

It was very impossible, but Bonnie said, "If you decide to go on this journey, I'll be with you until the end. Let's do it together."

and stood at the starting point

Looking out to sea, it was like being in another world. Before I started my first paddle, I could see the Cuban flag swaying in the wind from the rocks of Marina Hemingway, and the whole team on their boats, raising their fists and saying, "I'm here, I'm going with you."

Bonnie and I made eye contact and said, as a goal for this year, a phrase I've been repeating in training: "Let's find our way to our goal."

If you have a dream, there are things that stand in your way.

There will always be sadness and confusion in life, but if you believe in yourself, if you don't lose hope, if you can stand up when you're knocked down, if you believe that perseverance is one of the greatest traits we've been given, then we'll find our way.

He said, "Let's find our way to Florida together."

And so it started, and the 53 hours that followed were an intense, unforgettable experience.

Wonderful things are truly amazing. I'm not a religious person, but when I swim in the deep blue waters of the Gulf Stream and catch my breath and look at the eternal landscape, I can't help but be in awe of the blue earth.

I have like 85 songs in my playlist, especially in the middle of the night

We don't use any lights at all -- the lights attract the jellyfish, and the sharks also come.

I don't think anyone has ever experienced such pitch-black darkness.

I can't see my fingertips, I can't see my boat mates. Bonnie and my team mates in the boat know where I am by the sound of my arm tapping on the water. There's nothing to see.

And I was intoxicated with my own playlist.

(Laughter) I'm wearing a tight rubber swimming cap, so I can't hear anything.

I put on goggles and I sing while twisting my head 50 times a minute.

♪ Imagine if there's no heaven ♪ ♪ lulu lulu ♪ ♪ It's easy if you try ♪ ♪ lulu lulu ♪ I could sing this a thousand times in a row

(Laughter) That's a talent, too.

(Laughter) (Applause) Every time I finish this part, ♪ Oh, you may think I'm a dreamer, but I'm not the only one ♪ 222nd time

♪ Imagine there's no heaven ♪ And after singing John Lennon's "Imagine" a thousand times And after singing John Lennon's "Imagine" a thousand times I've swam 9 hours and 45 minutes.

exactly

Then came the problem, it's bound to come.

First you start vomiting, and the seawater makes you sick.

I wear a mask over my head for full protection from jellyfish.

I can't swim

The inside of my mouth rubs and hurts, but the jellyfish tentacles won't hurt me.

it lowers the temperature

The water temperature is 29 degrees, and I'm still losing weight and burning calories, even as I approach the boat.

You can't touch the boat, you can't go up, but Bonnie and the support team will hand over food and check on me.

In fact, I could see the Taj Mahal in front of me.

I was in a completely different zone mentally, and I thought it was amazing.

To come across the Taj Mahal in a place like this

It's a wonderful scenery

How long did it take to build that?

I'm a little crazy (laughs).

It's like a golden rule, but we don't know how long it will take, and nobody really knows.

I don't know what's going to happen next I don't know what's going to happen next

The weather, the currents, and the worst thing you can do is get stung by a jellyfish.

But on Bonnie's decision, on the third morning, she saw me struggling and barely swimming.

He pulled me over to the side of the boat and he pulled me over to the side of the boat and he said, "Look over there."

I was happy that it was morning

I saw a line of whitish lights on the horizon, and I said, "It's almost dawn."

Bonnie replied, "No, those are Key West lights."

We'll be in Florida in 15 hours, which is a long time for the average swimmer.

(Laughter) (Applause) I'm used to 15 hours of swimming training.

It's coming soon. For some reason, subconsciously, I've stopped counting how many times I've swung, I've stopped singing, I've stopped thinking about Stephen Hawking's words and the parameters of the universe.

I started thinking about this dream, and I started thinking about why and how I pursued it.

I told you that it all started when I turned 60, but it's not as simple as, "Can I do it?"

daily plans and

Self-discipline, and preparation, and pride in it.

But as time went by, I started to think about it: there's this saying, "Reach up to the stars."

In my case, it was "reach to the horizon"

And although some people, like me, may not reach it when it "reaches the horizon."

In the process, you grow tremendously, both personally and spiritually. The foundation you build as a human being while aiming for the horizon is immeasurable.

The opposite shore is approaching

I feel a little sad

An epic journey comes to an end

A lot of people now say, "What's next? That was amazing!"

Could it be the person who was following my swim on the computer?

"Where are you going to swim next? I'm looking forward to supporting you on your next challenge."

These people only participated in 53 hours

I spent years trying

There will be no more epic journeys like crossing the sea

But the point is, life is grand day by day.

When I went up to that shore, or rather, when I crawled up

I've practiced and prepared my pompous speech many times before.

Bonnie, who was running side by side in the boat,

When I was worried that the back of my throat was swollen, I called the medical team to the boat and told them that I was starting to have trouble breathing.

(Laughter) But then Bonnie said to the doctor, "I don't care if I can breathe.

If she can't give a speech about the shore, she'll go nuts."

(Laughter) But actually, the speech I prepared was the motivation for my long-distance swim training, and it was a completely different story.

It was a very moving moment, there were so many people and so many teams.

I succeeded. It's not my success. It's everyone's success.

We will never forget you will be a part of us forever

When I got to the shore, I managed to get three words out of my mouth. The first was, "Never give up."

That's my motto, as Socrates said

"Existence is action"

We don't just tell you, "Never give up,"

I think I was able to show it in action without actually giving up.

The second is "It's never too late to chase your dreams, no matter how old you are."

At 64, I've done what no one, regardless of age or gender, has done.

I believe that life is at its peak

(Applause) Yes.

thank you

And the third thing, when I got to the shore, I said, "This kind of lonely challenge seems like it's unique, and in many ways it is.

In other words, and most importantly, this is a team win, if you think I'm great.

Look at Bonnie

(laughs) Bonnie where are you?

Where are you?

She's Bonnie Stoll. (Applause)

I am a dear friend

Henry David Thoreau once said that when you achieve your dreams, it's not what you get that counts, but who you become in the process.

I'm standing in front of you like this

Within three months of completing the long swim, I was on Oprah's show, I was invited to President Obama's White House Oval Office, I had the privilege of speaking in front of people like you, and I signed a book deal with a major publisher.

These are all great and not to be taken lightly.

All of this makes me happy, but the reason I'm so proud of myself is that I live each day with that courageous way of living.

thank you enjoy the conference

Thank you. (Applause)

thank you very much

Thank you, please find a way too. (Applause)

Ladies and gentlemen, just think about a game called Monopoly.

But this game, like real life, isn't your typical game of skill, talent, and luck to win.

You get more money than your opponents, you have more opportunities to move around the board, and you have more resources available.

I'd like to ask you to think about this experience: how does the experience of being in control of an engineered game change the way you think about yourself and the way you think about other people?

That's exactly the question that we did a study at UC Berkeley to look at.

We called the subjects into the lab, made over 100 pairs of people who had just met, and then flipped a coin to randomly assign one of the pairs to be a rich person, and they played a game.

The rich side gets double the money. If you pass the "GO" square, you get double the salary.

Over the course of 15 minutes, we observed the situation with a hidden camera.

Today, for the first time, I'm going to show you some of what we've seen.

The sound quality is not good, but it's a hidden camera, so please forgive me.

I have subtitled

Rich Man: How many 500 are there? Poor: only one

Rich Man: Seriously? poor: yes

Rich man: I have three (laughs)

For some reason you gave me a lot

It seems they quickly realized that something was wrong.

Only one person apparently has more money than the other, and yet as the game progressed, we witnessed a very noticeable and dramatic difference between the two.

Rich players started making loud noises as they moved around the board, slamming their pieces around.

Rich people often used dominant gestures and non-verbal signs to show power and express joy.

I put a pretzel on the side

It's in the lower right corner of the screen

to observe the subject's completion behavior.

We looked at how many pretzels the subjects ate.

Rich man: This pretzel is also a gimmick.

Poor: come on

Of course I feel it

I'm suspicious of the presence of pretzels I'm suspicious of the presence of pretzels

As you can see, some people asked if the pretzels were a gimmick.

Even though I think it's suspicious, it seems that the influence of power due to one's position inevitably comes out, and rich people eat more pretzels.

Rich man: Pretzels are good

(Laughter) As the game progressed, a very interesting and dramatic pattern emerged. The rich became more arrogant toward their opponents.

Rich man: I can buy anything now

Poor: how much?

Rich man: I owe you $24.

I'm going to get rid of it soon

I have plenty of money

I have too much to use up

Rich 2: I'll buy the whole thing

Rich 3: I'm about to run out of money

i'm invincible

Now, what I find really interesting is that after the 15-minute game ended, the players talked about their in-game experiences.

When rich players inevitably give reasons why they won, that's how it's designed to work.

(Laughter) They bought different assets and talked about what they did to become successful.

I didn't care at all about the different circumstances that could have happened.

This really hits hard at the very nature of how people reconcile themselves to superiority.

Now, this Monopoly experiment can be used as a metaphor for understanding society and its hierarchies. There are people in society who are rich and high, and there are many people who are not.

What my colleagues and I have been doing for the last seven years is studying the effects of these hierarchies.

After dozens of studies, and with the help of thousands of people across the country, we've found that as people's levels of wealth rise, they feel less compassion and compassion, and more feelings of entitlement and self-interest.

In fact, according to surveys, wealthier people are more likely to view being greedy as ethically good, and are more likely to be in favor of pursuing self-interest as ethical.

Today, I'd like to talk to you about what this notion of self-interest means, why you should pay attention to it, and finally, what you can do about it.

Early research looked at helping behaviors, what social psychologists call prosocial behaviors.

The main interest is whether it's the rich or the poor who are more likely to help others.

One study called the rich and the poor into the lab and gave each of them the equivalent of $10.

He said, "You can keep these ten dollars, and if you want, you can give some of them to someone you don't know at all."

I never meet the person who will receive the money

And we watched how much the subjects gave away.

People earning $25,000 or under $15,000 a year gave strangers 44 percent more money than people earning $150,000 or $200,000 a year.

We asked the subjects to play a game to determine the characteristics of people who would cheat if they were to win a prize.

In one game, the computer was tweaked so that it wouldn't get above a certain score.

I cheated on this game and tried to win $50, three or four times as often.

Another study looked at people's propensity to take snacks out of jars, and they clearly stated that the snacks were for children. (Laughter) I'm not kidding.

I made it clear to the subject that there was a developmental study going on nearby, and this candy was a collaborator--

prepared for children

And we observed how many sweets the subjects took.

Those who perceived themselves as rich ate twice as many sweets as those who perceived themselves as poor.

I also checked the car.

It's more than just a car. We wanted to find out if different types of cars make drivers more likely to break the law.

One study tested whether drivers stopped for pedestrians pretending to cross a pedestrian crossing.

In California, of course, it's a rule to stop for pedestrians trying to cross.

The experiment looks like this

The person on the left is Sakura, disguised as a pedestrian.

As he steps forward, the red truck stops properly.

As is common in California, a bus overtakes and runs over a pedestrian.

(Laughter) For luxury cars, ignore the Prius, and the same goes for BMW.

Hundreds of cars were examined over several days, recording which ones stopped and which ones didn't.

What I learned from this is like a driver of a luxury car

more likely to break the law more likely to break the law

Not a single car in the lowest price range was violated.

Nearly 50% of top-end cars broke the law.

In another experiment, wealthier people were more likely to lie in negotiations and to condone workplace misconduct, such as stealing cash from cash registers, accepting bribes, and cheating customers.

I'm not saying that only wealthy people exhibit these patterns of behavior.

Not at all. In fact, we all struggle with these conflicting feelings in our daily lives, whether or not we put our own interests ahead of those of others at some point, if ever.

I can't help it, because the American dream is that everyone has equal opportunities and that if they work hard and work hard, they will succeed and prosper.

It also means that sometimes we need to put our own interests ahead of the interests and well-being of those around us.

Research has shown that the more wealthy people become, the more they seek ideals of personal success and achievement, and the less they care about the disadvantages of those around them.

Here's a graph of average household income over the last 20 years divided into fifths of the population and compared to the top 5%.

As of 1993, there is a considerable spread in income inequality between quintiles.

Anyone can see the difference

But over the last 20 years, that stark disparity has become a heaven-sent difference between the top and the rest.

In fact, the top 20% of the population owns nearly 90% of our wealth.

This level of economic inequality is unprecedented in human history.

This isn't just because a certain segment of the population is increasingly amassing wealth, but it's also making it harder and harder for a growing majority of people to achieve the American Dream.

As we've shown, the more wealthy people become, the more privileged they are, the more likely they are to put their own interests above the interests of others, and if they seek self-interest, this pattern is set to continue.

It's more natural to think of it as going from bad to worse. It's more natural to think of it as going from bad to worse.

Now, inequality and economic inequality are issues that we all need to think about, not just for those at the bottom of the social hierarchy, but for those at the bottom of the social hierarchy, because when economic inequality grows, whether it's an individual or a group, it makes things worse.

It's not just about poor people, it's about everyone.

There's a lot of research to back it up, and there's a lot of research out there from leading research institutes around the world that shows a lot of things that have weakened as economic inequality has grown.

Social mobility, the things we hold dear -- physical health, social trust -- all go down when inequality widens.

Similarly, negative things in social groups and in society itself -- things like obesity, violence, imprisonment and punishment -- are exacerbated by economic inequality.

As I said earlier, when this happens, it's not just a small group of people, it's going to have a devastating effect on all levels of society.

Even the richest people are affected.

So what should we do?

This never-ending stream of deadly ramifications may seem out of control.

But in fact, research in our laboratories is beginning to show that even small psychological interventions, small changes in values, small stimuli in certain directions can restore levels of egalitarianism and empathy.

For example, when people are reminded of the benefits of cooperation and the benefits of community, the rich become just as egalitarian as the poor.

In one study, we asked people to watch a short video, just 46 seconds, about child poverty, which was meant to remind them that there are people in need in the world.

After watching a video, a troubled person shows up in the lab.

An hour after watching the video, the rich were just as tolerant as the poor in dedicating their time to helping complete strangers. What this shows is that differences are neither inherent nor absolute, but can be dictated by subtle shifts in values, by a glimpse of compassion and empathy.

Signs of change are beginning to appear, not only in laboratories, but also in society.

Bill Gates, one of the richest people in our country, said in his Harvard commencement address that the problem of inequality facing society was one of the most formidable challenges and what we needed to do to combat it. He said, "The greatest progress of mankind lies not in discoveries, but in how we use them to alleviate inequalities."

There's an initiative called the "Giving Pledge," where more than 100 billionaires in our country have pledged to donate half their fortunes.

We are the One Percent, Resource Generation, Wealth for Common Good, to name a few. Through these activities, the privileged, the top 1 percent, and the wealthy are using their own economic power to empower young people and adults alike -- and what struck me most is that we need to use our privilege and our economic power to reduce inequality, demand changes in social policies and social values, and change people's behavior. Although this activity is against their own financial interests, it has the potential to one day revive the American dream.

thank you

(applause)

Hello TEDWomen!

(Applause) Your voice is low.

Hello TEDWomen!

(loud applause) I'm Maysoon Zayed. I'm not drunk.

I cut my mother's belly six times, each in a different direction, so poor me was starved of oxygen in my belly.

I have cerebral palsy and I am shaking all the time.

you see

I'm tired, diva Shakira's belly dance

I feel like I'm playing boxer Muhammad Ali at the same time (laughs).

(Laughter) Cerebral Palsy (C.P.) is also genetic.

No birth defects, no infections.

It wasn't because someone put a curse on my mother's womb, or because my parents were cousins, but they were cousins.

(Laughter) Cerebral palsy is accidental, just like when I was born.

First of all, I'd like to say please don't ask me to impress you.

You don't have to feel sorry for me either, because in the long life we ​​all dream of being disabled.

For example, when

It's Christmas Eve, you're in the mall, looking for a parking space, and you're going around the parking lot, and you see

16 handicapped parking spaces

You think, "Oh God, give me a little bit of a handicap."

(Laughter) And then I have 99 problems, and cerebral palsy is just one of them.

If there was a "World's Strongest People's Championship", I would be able to get a gold medal.

I'm a Palestinian Muslim female disabled and living in New Jersey.

(Laughter) (Applause) You'll think you're better. Be confident.

Cliffside Park, New Jersey is my hometown

What makes me really happy is that my hometown and my suffering share the same initials: C.P.

And it's great to be able to walk from my home to New York City if I choose to.

People with cerebral palsy usually don't walk, but my parents believed that nothing was impossible in the first place.

My father used to say, "You can do it, you can definitely do it."

(Laughter) So if my three sisters were mopping, I would mop too.

If my sisters went to public school, my parents would have sued the school system to get me to go to public school.

(Laughter) When I was five years old, my father taught me how to walk, just put my heels on his feet and just walk.

Another tactic my dad used was to hang a dollar bill in front of me and have him chase me.

(Laughter) My inner stripper spirit is so strong-

(Laughter) On the first day of kindergarten,

I walked with the style of a king Like a king beaten to the batter

When I was growing up, there were only six Arabs in town, and they were all my family.

Now there are 20 Arabs, and they are all my family. (Laughter)

No one seems to realize that we're not Italian.

(Laughter) (Applause) This was before 9/11, before politicians all started using "I hate Muslims" as their campaign slogan.

The people I grew up with didn't care about my religion.

But what really worried me was that I might starve to death during Ramadan.

I always used to say that I have a lot of fat and can go without food for three whole months, so a dawn-to-sunset fast is a joke.

I've tap danced on Broadway.

Yes, it's Broadway. (Applause)

My parents couldn't afford physical therapy, so they sent me to dance school instead.

If you can dance in heels, of course you can walk in heels.

I'm from Jersey, and I'm fashion conscious, so if my friends wore heels, so did I.

If my friends spent their summer vacations on the Jersey coast, I didn't spend them on the coast.

I spent my summers in conflict zones, because my parents feared that if we didn't go to Palestine every summer, we would become Madonnas.

(Laughter) Most of the summer vacation, my father would fight to cure me, and I would drink deer milk, cup my back, and soak in the Dead Sea.

(Laughter) But the magic cure we found was yoga.

I'll tell you, it's very boring, but before I started doing yoga, I was a stand-up comedian who couldn't stand.

Now I can do a handstand

My parents convinced me that I could do anything and that there was no dream that I couldn't achieve. My dream was to be on the daytime soap opera "General Hospital."

I benefited from affirmative action, went to college, and got a nice scholarship from Arizona State University (ASU) because I met all the eligibility requirements.

I'm like the drama department's pet lemur

loved by all

I took care of homework for children who were not good at studying, and not only did I get All A's, but the children I helped were also All A's.

Every time I acted out a scene from The Glass Menagerie, the professors cried.

But I never got the part

Finally, when I was in senior year, I got to put on a play in college called "Everybody Dances Slowly in Jackson."

It's a play about a girl with cerebral palsy.

I'm just a girl with cerebral palsy

I've already made a fuss, "Finally, I'll get a role too.

cerebral palsy

Free at last Free at last

Almighty God, I am free at last."

I didn't get the role (laughs).

Sherry Brown got the part.

I ran to the dean of the theater department and, screaming frantically as if someone had shot my cat, I asked why, the dean said it was because he thought I couldn't do stunts.

I said, "If I can't do it, so can the character."

(Laughter) (Applause) It's not an exaggeration to say that I was born for this role, but to be played by someone who doesn't have cerebral palsy.

College life was a microcosm of life.

Hollywood has a sordid history of able-bodied actors playing disabled people.

After graduating, I moved back to my hometown, and my first acting job was as an extra in a daytime drama.

A dream was coming true

Because I was convinced that I would soon be elevated from "guest number two" to "freak's best friend."

But in fact, it was just part of the background, just the back of my head, and what I learned was that the casting director didn't use a stranger who was ungrounded and had a disability.

We only hire perfect people

but there was an exception

Whoopi Goldberg, who I used to watch as a kid, Roseanne Barr, Ellen DeGeneres, and these women have one thing in common: they were all comedians.

So I became a comedian too.

(Laughter) (Applause) My first job was to drive some of New York City's most famous comedians to New Jersey. I couldn't believe the look on the first comedian's face when he realized he was being driven down the New Jersey highway by a little girl with cerebral palsy.

I've performed shows in clubs across the United States, and in the Middle East, in Arabic, as usual, without hijab or banned words.

Some say I was the first stand-up comedian in the Arab world, some say I was the first stand-up comedian in the Arab world.

I don't want to call myself number one, but I don't think you know all those terrible rumors about women being boring because you're laughing to death at our show.

In 2003, my best friend Dean Obeidala and I launched the New York Arab-American Comedy Festival, which is now in its 10th year.

Our goal is to change the negative image of Arab Americans in the media, but also to teach casters that South Asians and Arabs are different.

(Laughter) It's very easy to make Arabs "normal."

I broke in 2010

I made a guest appearance on a cable news show, "Countdown with Keith Olbermann."

I walked in dressed like I was going to a prom, and was taken into the studio where I was seated on a chair with rolling wheels.

I gave the director a look and said, "Excuse me, can I have another chair?"

When our eyes met, she started counting "5, 4, 3, 2..."

I just went live

I had to cling to the desk in front of me, because there's no way I could roll off the screen during a live broadcast, and by the end of the interview, I was pale.

I thought I'd ruined the opportunity that finally came and that I would never be invited again.

But Mr. Olberman not only invited me back, but he even let me make a regular appearance, and he fixed my chair.

(Laughter) (Applause) I did a show with Keith Olberman, and I learned an interesting thing: people are trash on the internet.

They say kids are cruel, but I've never been teased since I was a kid.

But online, my disability was easy prey.

If there's a video clip online, there's a comment that says, "Hey, is this guy a drug addict?"

"Hey, is this guy retarded?"

My favorite is "The Gumby Doll's Mouth Terrorist

Poor thing why are you suffering?

Let's all pray for her."

One suggestion was to add disability to my biography: "Writer, comedian, cerebral palsy."

A disability is as obvious as the color of your skin.

If people in wheelchairs can't imitate Beyoncé, then Beyonce can't imitate people in wheelchairs.

Disabled people are the biggest - yes, please clap here.

(Applause) People with disabilities are one of the world's largest minorities, but they're the most underrepresented in the entertainment world.

The doctor said I can't walk, but here I am in front of you.

But if I had grown up in the age of social media, this probably wouldn't have happened.

I want to work with you to improve the image of people with disabilities in the media and in everyday life.

If you have a positive image, you may be less likely to be the object of hate online.

is it difficult

It would take the whole village to work together to raise a child.

I was able to have a wonderful experience thanks to the fact that I have walked a road with mountains and valleys.

And I walked the red carpet, too, with daytime queen Susan Lucci and the legendary Lorraine Arbus.

I got to work with Adam Sandler in a movie, and I got to work with my idol, the amazing Dave Matthews.

He also carried out a world tour "Arab Gone Wild" as a driving force.

Represented New Jersey on the 2008 Democratic National Committee Represented New Jersey

I founded a charity called Maysoon's Kids to give Palestinian refugee children the chances my parents gave me.

But the greatest moment I've ever had, except for this stage, of course -- (Laughter) (Applause) -- the greatest moment was when I put on a show for someone who flutters like a butterfly and stings like a bee.

(Applause) That was the only time my father came to see the live show, and I dedicate this talk to his memory.

(Arabic)

I'm Maysoon Zayed If I can do it, so can you

(applause)

I don't know about you, but I still don't know exactly what technology means in life.

I spent the last year thinking about what that really should be.

Should I support technology? Should I welcome you?

Should I be vigilant? Like you, I'm very interested in new things.

But a few years ago, I actually gave up on everything I owned, sold all my technology except my bike, and traversed 4,800 kilometers of country roads in America on mostly sweet buns and junk food.

(Laughter) Since that day, I've tried to distance myself from technology and not let it dominate my life.

But at the same time, I run a website called cool tools, where I showcase the latest technologies that I love every day.

So I'm still struggling with what technology really means, its interaction with humanity, its interaction with nature, its interaction with spirituality.

Maybe we don't even know what technology is in the first place.

In fact, the very first recorded definition of technology

This is the very first use of the word technology that I could find.

It was written in 1829 in Cambridge University's Applied Arts and Sciences course outline.

Before that, technology didn't exist as a word, but technology did exist.

I like Alan Kay's in that definition, he

I said technology was invented after you were born.

(Laughter) It sums up the current topic really well.

Danny Hillis added that technology just doesn't work.

(Laughter) I think that's also related to the answer we're thinking of.

But there is another definition that I like.

This also goes back to the basics.

It's deeper and more difficult to understand, so I thought I'd ask a question, which I think helped me with my research.

And today I'm talking about it for the first time

So I think this is a very broad statement.

The question that I came up with was, "What does technology want?" And what does it want, not chocolate or vanilla, but what are its inherent tendencies and biases?

What trends do you see over time? To make this easier to understand, let's think about biology.

The secret that Richard Dawkins used was to think of organisms as just genes, as carriers of genes.

what does his gene want? It means "the selfish gene."

So I thought, as well, when you look at everything in our culture from the perspective of technology, what does technology want? and

Of course, this is an imperfect question, and it's just as imperfect a view as we see living things as genes.

But it's still a very productive view, so I'm going to say, what do we want when we look at the world from a technology standpoint?

Once we get to this question, we have to go back to life, because I think if we keep going back to the roots of technology, we'll eventually get to life.

So I'm starting this little adventure with life.

As I heard from previous speakers, we don't really know what kind of life exists on Earth today.

i don't understand at all

I thought Craig Venter's attempt to look at the genetics of marine microbes was brilliant.

Brian Farrell's work is also relevant in terms of discovering all the species on this planet.

So one thing we have to do is draw a grid on this planet, and randomly pick all the intersections of that grid and go and see what life is like there.

This is hidden on our planet, not on other planets.

This is an ant that stores the nectar produced by its mates in its abdomen.

The creatures that you just saw, the amazing creatures that Jamie and others introduced, all beat the rules of life.

I can't come up with a single universal law that makes no exceptions for any organism anywhere.

Every creature we can think of, if you've ever heard Olivia talk about her sexual behavior, you'll realize that there's no such thing as true to all life, because they're hacking in some way.

This is a solar-powered sea slug that has chloroplasts in its tissues to use energy.

This is a similar seadragon, and the blue one below is a larvae that hasn't yet ingested acid or greenish-brown algae before it can generate its own energy.

These are also hacks, and all of these types of hacking organisms are grouped into six kingdoms: the plant kingdom, the animal kingdom, the fungi kingdom, the protist kingdom, the bacteria kingdom, and the archaea kingdom.

These are the basic ways of life, one way of understanding life on Earth.

A more interesting way to look at it is to look at it from the perspective of "evolution" over time.

This is a diagram of evolution, not in linear time, but starting from the center.

At the center of this genealogy is the earliest evolutionary stage, which includes all life on Earth, all six planes.

You can see where humans are among the 4,000 representative species.

What I found interesting is that all living things on earth are equally evolved.

These fungi and bacteria are as evolved as humans.

It's been the same trial-and-error process throughout the human race's existence.

When you look at this, you can see that each creature is hacking and has a different approach to life.

Let's look at the timeline of life and ask the question: What does "evolution" require? I can say a few things

The first thing I can say about evolution is that there is no place on earth without life.

There is always life, and if you drill a hole in the center of a rock, there will always be bacteria in the crevices of the rock.

Wherever life exists, it is ubiquitous and multiplies without retreating.

And inanimate places on Earth become animated with life.

The second thing I can say about evolution is that there is diversity and specialization.

For example, cells that have general functions can become more specialized and specific.

It turns out that the complication of these organisms is spontaneous.

We also have data that shows that it tends to naturally become more complex over time.

Finally, I'll come back to the nudibranchs again.

One thing that can be said about life is that it's becoming more sociable, which means that one life's survival environment involves other life.

Chloroplasts, for example, have been incorporated into the cells of other organisms [note: considered parasites].

Organisms are co-evolving without violating their independence.

Long-term trends in evolution can be grouped into five categories: ubiquity, diversity, particularity, complexity and sociality.

And what does technology want?

And then I made a startling discovery: even technology tends to specialize.

For example, this common hammer becomes more specialized over time.

many things will become more diverse

This is everything in a Japanese house

Actually, last summer, I handed my daughter a counter and gave her a task to count all the technology in the house.

I found 6,000 different products.

In my later research, I found out that King Henry VIII of England had only 7,000 types of technology in his home.

Because he was the king of England, he was the property of all England.

Now you can see that there's a really diverse number of technologies.

This is a scene from Star Wars where 3PO sees a machine building another machine.

In fact, I think we're doing this kind of "machine globalization."

Only other technologies are replacing technology

Most machines will have no contact with anything or life outside of other technologies.

And third, I think it's already become a cliché that machines are becoming more biological and complex.

So the trends in technological evolution are the same as those in biological evolution: ubiquity, diversity, socialization, and complexity. In fact, it may even be commonplace. If you look at the evolution of armor, for example, it can be traced in a similar way to a phylogenetic tree.

I believe that technology is the seventh biological realm.

I think you can think of it as the 7th realm because it is very similar in function and mechanism to the other 6 realms.

If I were to put it in the picture, I think it would be above the animal kingdom.

This is Niles Eldredge, who, along with Stephen Jay Gould, put forward a theory of evolution called punctuated equilibrium.

He collected cornets as a hobby.

He has the largest collection in the world, 500 cars.

He tried to morphologically analyze the cornets as if they were collections of trilobites and snails, and to analyze them evolutionarily.

Here's a diagram he created, not officially yet.

It's not published, but what's interesting about this diagram is the discontinued cornet parental line, shown in red at the bottom, and this phenomenon doesn't occur in biology.

Extinct organisms do not become parental lineages

But it can be in technology, and that's the nature of technology, and it's the genealogy that allows us to distinguish between technological systems and biological systems.

I thought it was very important to be able to resurrect ideas that had once disappeared, so I thought about what would happen to old technology.

And it turns out that technology isn't going to die.

When I told this to a historian of science, he said, "Well, what about steam cars?

doesn't exist anymore? But it actually exists

In fact, you could buy parts for Stanley's steam car brand new.

This is a website that sells new parts for Stanley cars. What I love about it is that it's a one-click "Add to Cart." (Laughter) You can buy a steam valve.

So instead of a random sample like this

I decided to look into it in a conservative way.

So I searched through the 1895 Montgomery Ward catalog, and I picked a page, a page that wasn't random.

I wanted to know how many were still being produced, not antiques.

The answer is all products

All commodities are still produced today e.g. corn shellers

I don't know who needs corn sheller.

We had corn shellers, plows, and winnows. Again, not antiques, you can order them all. You can buy new ones online now.

You can actually buy a Stone Age knife for 50 dollars, made in the same way as it was 10,000 years ago.

It's short, fifty dollars for a handful of bones, and more importantly, the fact that this information has never disappeared.

It wasn't resurrected, it was there all along.

And in Papua New Guinea, stone axes were being made 20 years ago.

It turns out that it's very difficult to try to erase technology.

We hear that the Amish don't use cars.

And I also hear that Japanese people don't carry handguns.

I hear a lot about it. So I looked to see if there was any technology in history that was ever banned, and when it was revived, and what I found was that it's been illegal and banned for less time. You can delay technology, but you can't eliminate it.

It's because I don't run out of ideas.

So if you take the idea of ​​how culture is changing and put it in the context of the long-term evolution of life -- when there's a big change in life -- you see that evolution accelerates and changes the way evolution happens.

It's changing the way ideas are born.

So these evolutionary steps are basically evolving evolutionary possibilities.

So what's happening to life over time is that there are more and more ways that these new ideas and hacks are generated. The trick here is to explore how to explore.

What this tells us is that, as predicted by Kurzweil and others, technology is accelerating evolution.

It's accelerating the way we search for ideas.

So having life to hack - life is hacking, it's a game of survival - evolution is a way to change the rules of the game and extend the game.

And technology is about a better way to evolve.

We call this the "Infinite Game"

This is the definition of the "infinite game." A finite game is played to win, an infinite game is played to keep playing.

I also believe that technology is a force in the universe.

I think the origins of technology are not 1829, but the beginning of the Big Bang, the moment when billions of stars in the universe were compressed. The whole universe was compressed into tiny quantum dots, so tight that there was no room for differences.

That's the definition. There was no temperature either.

There weren't any differences, and what expanded with the Big Bang was room for difference.

And as things magnified, it created the potential for difference: diversity, choice, choice, opportunity, possibility and freedom.

they are all basically the same

And they're all driven by technology.

What Technology Brings: Choice, Possibility, and Freedom

That's what it's all about, it's about opening the door to making a difference.

So if we grab the hammer, that's what we're holding.

We keep grabbing technology because we want those things, because they're good.

Differences, Freedom, Choices and Possibilities

And as we create new opportunities, we're enabling platforms to create new ones.

And I think that's very important, because if Mozart had been born before the piano was invented, how much would society have lost?

What if Van Gogh was born before cheap oil paints were invented?

Imagine Hitchcock before film technology was invented.

The millions of children born today have not yet invented the technology to express themselves.

We believe that every person on earth has a moral obligation to invent technology to make individual difference.

We want trillions of individuals.

That's what technology really wants.

I'm going to ignore some of the objections, because I don't have the answer to deforestation.

And I can't even answer why some technology is bad. I don't know how it affects dignity.

Maybe, in a way, we're trying to find a place for technology.

Spraying cotton fields with DDT is a terrible thing, but using it to reduce the deaths of millions of people in small villages from malaria is a good thing.

We humans are actually defined by technology.

Everything we think we love about humanity is driven by technology, and it's an endless game.

this is what we are talking about

Technology is a way to evolve evolution

It's a way of exploring possibilities and opportunities and creating more.

it's the way to play all games

That's what technology wants

So when I think about what technology wants, I think it's relevant to everyone here. I believe that everyone has challenges.

Its recursive nature is the infinite game.

If this works, other people will get involved and the game will continue to spread even after you're gone.

This is the infinite game, and technology is the medium through which that infinite game is played.

And that's why I think we should welcome technology, because it has such an important role to play in knowing who we are in the course of our lives.

thank you

(applause)

I live and work in Tokyo, Japan

I specialize in the study of human behavior, and my job is to apply research results to the future in a variety of ways, and then design that future.

I've been doing this job for seven years, and I haven't caught a clue as to what the future holds.

But I have a pretty good idea of ​​how humans will behave in the future.

This is my office, it's all over the place.

We're not stuck in the lab. India, China, Brazil, Africa, and more and more.

6.3 billion people live on our planet

By the end of this year, 3 billion people will be connected with mobile phones.

And two years from now, another billion people will join there.

I'm telling you this because we need to know what these people are doing when we think about designing for the future.

This is what I and my team do, so to speak.

Our research begins with a very simple question

For example, a question like, "What do you carry around?"

Think of all your belongings What would you take with you if you walked out that door?

What if we looked around?

What do you actually bring with you?

And even more What is actually used in it?

What's interesting is that the act of choosing, consciously or unconsciously, what we own and what we use has mental, emotional and functional value.

To put it bluntly, people spend their money on things of value, right?

I spent about five years studying what people carry around.

in people's bags and pockets purses

I've traveled all over the world, inspecting people's homes, and even chasing people down the street with my camera.

Allowed but a form of stalking

We did these for the first question, "What do people carry around?"

It turns out that people carry a lot of things

that's a good thing

If you ask them to name the three most important things they carry with them, regardless of their culture, gender or environment, most of them will say: keys, money and, if you have, your cell phone.

I'm not saying this is a good thing, but isn't it fun?

It's hard to take your cell phone away from you.

If you do that, you'll be kicked out.

As someone who works for a mobile phone manufacturer, this might seem like a natural answer.

The question is what is the reason

So why are mobile phones so important in our lives?

Our research has shown that this is related to survival, survival for yourself and your loved ones.

Keys provide a safe haven, warmth - and transportation.

Money can be used for food and all other things that are necessary for life.

And cell phones turned out to be powerful recovery tools.

Applying Maslow's Hierarchy of Needs, we see that these three things are the key ingredients for satisfying the lower level needs.

Of course, that's not the whole story, but it helps a lot in this regard.

Mobile phones, in particular, have the ability to let people jump through space and time.

In other words, you can cross the distance by making a phone call.

You can also transcend time by sending and receiving emails whenever you like.

And that's why it's so universally held in high esteem -- that's why mobile phones are used by more than three billion people.

People value being connected

But it's the same thing with a computer-

You can also use public phones

Cell phones also meet some of our personal needs for privacy and convenience.

You don't need anyone's permission, just use it simply.

But when you think of them as survival tools, portability becomes important.

But misplacement is a very big problem.

We are human and forgetting is part of human nature.

i think it's a great feature

We forget things, but we accept them and adapt well to the situation.

we can recall one of them was said yesterday

Simply put, it's a point to remember.

As soon as you leave the room, you'll notice, look around and find your pockets.

A woman with a bag

I look around, I search the room again, some say they lost it.

everyone has some experience

I think most people do, but if you live in the same house all the time, unless you're traveling all the time or living in a hotel, most of you have a kind of center of gravity.

Various things gather at the center of gravity

Even if they don't stay forever, they will gradually gather

What you lost may be found there

When you're looking for something, when you're looking around your house, if you're looking for something like this, the center of gravity is the first place you'll look.

In this study, we found that if you search for something this way, you're 100% sure you'll find it, and you'll never forget it.

Simply put, you don't even have to remember

(laughs) It's kind of like a fortune cookie, isn't it?

It's actually using a technique called delegation.

From a design perspective, this has to do with understanding what we can delegate to technology, and what we can delegate to others.

Delegation can be a solution for almost anything except physical functions like going to the bathroom.

I can't ask someone to use the toilet

And excluding entertainment, you can't pay someone else to enjoy movies for you, at least for now.

Maybe someday such a future will come

Now let's look at an example of delegation in action.

This is an example of one of my most intense research studies on illiteracy: How do illiterate people make phone calls?

According to 2004 United Nations statistics, 800 million people worldwide cannot read or write.

we did a lot of research

So one of the things that we've focused on is that even if you're an illiterate person, when you want to reach someone far away, you first need to identify the person you want to contact.

It could be a phone number, an email address, a zip code.

In short, if you can't read and write, how do you manage your contacts?

The answer is actually what millions of people do.

From a design perspective, I didn't quite understand how they did it, and this is just one small example of what we've been doing in our research.

Illiterate people were masters of delegation

They were asking other people to do parts of the work process that they couldn't do themselves.

Let me give you another example

This is a little more sophisticated, and it comes from a study I did in Uganda about how people who share their cell phones use them.

"Sente" is the Ugandan word for money

the other means call charges

It works like this

You, June, live in a remote village.

i am a breadwinner in kampala

When I transfer money, I do it like this

There's only one person in your village who has a telephone, and he's the payphone operator, so to speak.

They use mobile phones with very simple functions instead of payphones.

So I bought one prepaid card like this

Instead of charging the card into my own cell phone, I'll call the local operator.

And you give them your number and they charge their phone

Now you can recharge from Kampala, which means you can recharge from the comfort of your own village.

You get a 10% to 20% commission, so the operator at the phone booth takes a 10% to 20% commission and gives you the rest in cash.

There are two things I like

First of all, anyone with access to a mobile phone, anyone with a mobile phone, can effectively become an ATM machine.

This will enable basic banking services to be available even in areas where the infrastructure for financial institutions is underdeveloped.

Even if they have access to the infrastructure of a financial institution, it doesn't mean they can open a bank account, because they're not rich enough to open a bank account.

The second feature I like is that

Even with all the resources at my disposal and the combination of my advanced intellectual tools, I couldn't come up with such a sophisticated design that was fully adapted to the situation on the ground.

We have Grameen Bank and Microbanking.

But the difference with this case is that there is no central governing body.

Innovation on the street corner

In this way, the city is an inexhaustible storehouse of ideas for us.

And if a device like this breaks down, I'll give it back to the carrier.

Then you will get a new

maybe three

In other words, if you buy three, you only get one.

If you go to India or China, you'll find shops like this in the streets

Take your broken phone here, fix it, and use it again.

This is a phone repair workshop in Jilin, China, where we take phones apart and put them back together again.

The manual was also reverse engineered.

This is a kind of hacking manual, and it's written in Chinese and English.

There is also a Hindi version

There is also a manual subscription system

There are training institutes that send out a lot of people who are good at fixing these things.

What I love about this example is that, after all, you can do this job in the city with a product savvy person with a small workspace, a small screwdriver, and a toothbrush to clean the contacts -- cleaning the contacts is important.

This is what the social network of knowledge that's spreading all over the world looks like.

What's interesting is that this doesn't fit with the way we design, the way we manufacture, and maybe the way we distribute.

It's a challenge to the norm

I find many different problems in the city

This is Viagra I bought at an adult store in China.

Counterfeit goods are widely distributed in China.

have you tried it?

I can't answer

Examples like these point to issues of trust and trust in the buying process.

And then we're going to look at how this sort of thing might apply, for example, in terms of design, to future online services in these countries.

This is Tibetan underwear. (Laughter) I'm being honest when I see this.

I wondered why such a pocket is necessary for underwear.

And when you look at things like this, it makes you wonder, if you were to collect all the functions of these things and re-arrange them around your body, what would you prioritize as a sort of personal area network?

Even with these trivial examples, the lessons learned can be applied to personal area networks.

Here are some phone numbers on a shack in rural Uganda.

This is a phone number, not a street address

So what happens when people are identified by cell phones?

What if 3 billion people had their mobile phone identity instead of their landline?

The old way of thinking about identity no longer works for the next three billion people.

change happens like this

Let me explain this photo

This is a photo from Delhi when I started my research.

When I was doing research on illiteracy, this man was a tea shop clerk.

You can see the chai being poured in the back

He's an incredibly poor tea shop clerk who belongs to the bottom of society.

And for some reason he sympathizes with Livestrong's thinking.

They may not have the exact same values, but they go out and buy them and wear them, so it must be Livestrong.

To me, this seemed to me to be a human figure in this world where everything is connected and intertwined.

The title of this presentation is "Connections and Consequences," and it's kind of the conclusion of a five-year quest, if all people on the planet were connected, and if individuals could transcend space and time in a simple way.

what will happen

It's four things:

The first is speeding up ideas, which speeds up the flow of ideas.

TED is a great idea, but the reality is that the measure of great ideas also changes.

If you want a great idea, it has to encompass everyone on the planet, and that's point number one.

The second is object immediacy

What I'm trying to say here is that the smaller the phone, the more features you can access, like finance or authentication -- these things are very easy and fast to move around the world.

If 6.3 billion people had it, and if it grew to be the world's population, the overall speed of acceptance would be much, much faster than you can imagine.

And the third is that no matter how much we design these things, the city, when it receives it, will find ways to innovate, as long as it meets a basic need, like the ability to transcend space and time, but in ways we never expected.

will continue to innovate

No matter how hard we try, they'll be smarter

that's how i feel

The smart response to that is to keep watching what happens, and figuring out how to incorporate that insight into what we design and how we design it.

The last one is about the direction of the conversation.

When the other 3 billion people are connected, they want to join the conversation.

And I think it's important for us, and the way we relate to TED, to learn how to embrace that and listen.

we need to learn how to listen

thank you

(applause)

Three and a half years ago, I made the best decision of my life.

As a New Year's resolution, I decided to stop dieting, stop worrying about my weight, and eat with all my senses.

Now, when I feel hungry, I eat normally, and I've lost about five kilograms.

This is me at 13 when I started my first diet.

Looking at this picture now, I realize that this person needed more fashion advice than diet.

(Laughter) But I thought I should lose weight, and of course I blamed myself when I gained it back.

Over the next 30 years, I went on and off various diets.

No matter what I tried, the weight I lost just came back

Many people will understand that feeling.

As a neuroscientist, I wondered why dieting was so difficult.

Obviously, weight is determined by how much you eat and how many calories you burn.

What many people don't realize is that hunger and calorie consumption are controlled almost unconsciously in the brain.

The brain does a lot of work behind the scenes, and that's a good thing. Conscious behavior - how do I describe it - can be a little distracting.

You don't have to worry about breathing when you're immersed in a movie

I don't forget how to walk when I'm thinking about what to have for dinner

Your brain knows how much weight you need, apart from what you consciously believe.

This is called setpoint, but it's a misleading term, because it ranges from 4 kg to 7 kg.

You can change your weight in that range by changing your lifestyle, no matter how hard you try to get out of that range.

The part of the brain, the hypothalamus, works to control your weight. There are more than a dozen chemical signals in your brain telling you to gain weight, and more than a dozen chemical signals in your brain telling you to gain weight and more than a dozen chemical signals telling you to lose weight. I'm trying to keep

Is it the same as a thermostat?

Maintains a constant temperature inside your home even when the weather outside changes

If you open the windows in the winter and try to change the temperature in the room, the thermostat doesn't change the setting, so the heater kicks in and tries to bring the temperature back up.

The brain works in exactly the same way, and when you lose weight, it uses a powerful mechanism to try to get you back to what you consider normal weight.

When you lose a lot of weight, your brain thinks you're starving, and whether your starting weight is high or low, your brain reacts in the same way.

We would like to think that your brain can tell if you want to lose weight or not, but it doesn't.

When you lose a lot of weight, you feel more hungry and your muscles burn less energy.

Rudy Laibel, Ph.D., of Columbia University, found that people who lost 10 percent of their body weight slowed down their metabolism and burned 250 to 400 fewer calories of energy.

This equates to a significant amount of food.

So to maintain the weight you lost on the diet, you'd have to continue to eat this much less than someone of the same weight who was already lean.

From an evolutionary perspective, it makes sense for the body to defy weight loss.

When food was scarce, our ancestors' survival relied on reducing wasteful consumption of energy, preparing for the next starvation by gaining weight when food was available.

In human history, hunger was a bigger problem than overeating. Hunger was a bigger problem than overeating.

This explains one very unfortunate fact: the setpoint can go up, but very rarely does it go down.

If your mother said that life is unequal, this is exactly what she meant.

(Laughter) Successful dieting doesn't lower your setpoint.

Even if you keep your weight under control for seven years, your brain is still trying to put it back on.

If the weight loss was due to prolonged starvation, this is a reasonable response.

In today's world of drive-thru burger joints, that's not going to work for many people.

Yoni Friedhoff, Ph.D., of the University of Ottawa, believes that obesity is caused by the difference between our ancestors' time and modern satiety, and she even wants to take obese patients to a time when food was scarce.

Unfortunately, temporary weight gain can become permanent.

If your weight stays high for a long time, usually for a few years or so, your brain will assume it's your normal weight.

Psychologists classify people into two groups when it comes to food: those who eat in response to hunger, and those who try to control themselves through self-control, as many dieters do.

Let's call this the intuitive group and the self-disciplined group.

Interestingly, the Intuitive group was less likely to be overweight and spent less time thinking about food.

Self-restraining groups are vulnerable to advertising, oversized food, all-you-can-eat buffets, and they tend to overeat.

A little indulgence, like a scoop of ice cream, can easily lead to overeating in the self-restrained group.

Children are especially vulnerable to cycles of dieting and overeating.

Several years of research have shown that girls who diet in their early teens are three times more likely to be overweight after five years, even if they start at a normal weight. And all the studies in this area show that eating disorders are more likely to occur for the same reasons as weight gain.

By the way, another cause [of eating disorders] is -- you parents -- teasing your child's weight at home.

don't do that

(Laughter) I left most of my graphs at home, but I really wanted to show you this one, because I'm a big fan of numbers and that's how I live my life.

(Laughter) This is a 14-year study of how four healthy lifestyle habits are associated with risk of death: eating enough fruits and vegetables, exercising three times a week, not smoking, and drinking in moderation.

Let's start by looking at a normal weight person.

The height of the bar graph represents the risk of death, and the numbers 0, 1, 2, 3, 4 on the horizontal axis are the number of good lifestyle habits that apply to that person.

As expected, fewer people who lead healthy lives die during research.

Let's see what happens with overweight people.

People who have no good habits at all are at greater risk of death.

Even just one good habit lowers the risk to normal levels.

People who are obese and have no good habits are seven times more likely to be at risk than the healthiest group in the study.

A healthy lifestyle is good for obese people too.

In fact, for those who had all four good habits, there was little difference in risk from weight.

If you control your lifestyle, you can keep your health normal even if you can't lose or maintain your weight.

diet is unreliable

Five years after dieting, most people put the weight back on.

40% of people will gain more than their original weight

That's why most diets tend to result in weight gain over the long term, rather than weight loss.

Now that you know that dieting is a problem, what should we do? I have a question

My answer is, in a nutshell, focus your senses.

I'm not telling you to learn how to meditate or do yoga.

I'm talking about mindful eating, understanding your body's signals, eating when you're hungry, and stopping when you're full, because if you eat when you're not hungry, you'll gain weight.

what should i do

First of all, eat as much as you want and think about the amount that feels right for your body.

Eat your usual meal without being disturbed by other affairs

Think about how your body feels at the beginning and end of your meal, and when you've done that, use hunger alone to decide when to stop eating.

It took me a year to figure this out, but it was really worth it.

I'm eating the most relaxed meal I've ever had in my life.

I often don't even think about food

I forget even the chocolates at home

It feels like aliens have taken over my head

It's all changed

I have to say, you won't lose weight this way unless you're not hungry, you're not a eater.

Let's face it, if dieting works, you're already thin, aren't you?

(Laughter) Why do you keep doing the same thing and expect better results for yourself?

Dieting may seem harmless, but it actually does more harm than good.

Worst of all, it makes life crazy, and weight obsession can lead to eating disorders, especially in young children.

In America, 80% of 10-year-old girls say they've been on a diet.

My daughters' generation is judging looking good by the wrong standard.

Dieting, at best, is a waste of time and energy.

You need willpower -- whether it's helping your kids with their homework or completing an important work project -- but there's a limit to willpower, and the strategy of relying on it endlessly is bound to fail when your mind shifts to something else.

Lastly, I would like to say one more thing.

Telling girls on a diet if they're hungry they can eat

If you teach them not to be afraid to eat, but to eat naturally according to their appetite,

They'll have a happier, healthier life, and they'll likely be fitter when they reach adulthood.

I wish someone had told me this when I was 13.

Thank you

(applause)

Here's a picture of me and my dad on the beach in Far Rockaway, maybe Rockaway Park.

blonde hair is me

the one who has a cigarette is my father

Back in the '60s, everyone was smoking.

In the summer of 2009, my father was diagnosed with lung cancer.

Cancer makes everyone nervous

1 in 2 American men will be diagnosed with cancer in their lifetime

1 in 3 women will get cancer

Everyone knows someone who has cancer, right?

Now my father is getting better, and one of the reasons is that he was able to take a clinical trial of a new experimental drug, which was specially formulated for his cancer and worked really well.

There are over 200 types of cancer

I want to talk to you today about how we can help more people like my father, because we need to change the way we think about funding cancer research.

After I found out my father had cancer, I was having coffee with my friend Andrew Law once.

He's the head of the financial engineering lab at MIT, and I was working there, and we were talking about cancer.

Andrew continued to do a little research, but when he looked into the literature on one of the things that other people had taught him, it turned out to be a really big bottleneck.

Developing new drugs is very difficult, because drugs are very risky and very expensive in the early stages of drug development.

So I was asked by Andrew if I could help him with his work using mathematics and analytics, and see if we could figure out what we could do.

i am not a scientist

I don't know how to make drugs

None of my co-authors, Andrew Law, Jose Maria Hernandez, or David Fagnan, are scientists.

They don't even know the basics of how to make a cancer drug.

But I do know a little bit about risk mitigation and financial engineering, so I started thinking, what can we do?

I'm going to tell you what we've been working on over the last few years, and we think it's going to fundamentally change the way we research cancer and other things.

We want research to attract funding, not the other way around.

First, let me talk about what it means to fund drugs.

Imagine you're a scientist in a lab, and unlike me, you're a scientist, and you've developed a compound that might be useful in treating cancer patients.

You test it in animals, you test it in test tubes, but ultimately you want to move it from the lab bench to the clinic.

Testing a drug is basically a series of experiments -- these large-scale experiments called clinical trials -- to determine if the drug is safe and whether it works.

So the FDA has a very specific code of conduct.

The first phase of this test is the toxicity test, called Phase 1.

Give the medicine to healthy people and see if they actually get sick.

In other words, no matter how good a drug is, if the side effects are too strong, it's worthless, like dying of a heart attack or liver failure.

whether to cause

If that happens, it's going to be a pretty high hurdle.

At this point, about a third of the drug will drop out.

The next step is testing the effectiveness of the drug, where you give the drug to a cancer patient and see if it actually makes them better.

It's a higher hurdle, isn't it?

And then in phase three, we're going to test it on a fairly large sample, trying to determine if it's the right dose or if it's better than what's in use.

After all that, only a very small percentage of the drugs actually get to the next step.

This blue bottle, it saves lives, and it's worth billions more, sometimes billions of dollars a year.

Now let me ask you a question. Let's say I ask you to make one investment. Well, let's say you buy one of these bottles for two million dollars. Two million dollars to buy one of these bottles. I won't tell you which bottle.

Sounds lucrative, doesn't it?

No... isn't it?

Of course, it's a very risky endeavor, so it's very difficult to raise money, but that's the starting point for our proposal.

It takes a long time because we have to fund these tests from the very beginning.

Andrew said to me, what if you don't think it's medicine?

How about thinking of it as a financial asset?

The payoff structure is really shady, but let's drop all our financial engineering knowledge.

Let's use our trading tricks to see if these drugs could become a financial asset.

first create a huge fund

You know what to do with risky assets, right?

Put it in your portfolio to flatten the volatility of your earnings

So I did the math and found that it works, but that would require about 80 to 150 drugs.

Fortunately, there are many drugs waiting to be tested, as I said earlier.

About 20 years worth of drugs are waiting to be tested because they don't have the money.

In fact, the early stages of the process of funding a Phase 1 preclinical drug are called the "Valley of Death" in the industry, because that's where the drug dies.

Of course, if you don't pass, you can't move on to the next step.

I found out that I need about 80 to 150 medicines to pass one.

So we did a little more math and said we needed between 3 billion and 15 billion dollars.

To solve one old problem, a new problem arose.

We've mitigated the risk, but we've also needed a lot of new capital, which can only be raised in the capital markets.

It's not venture capital, it's not charity.

We have to find a way in the capital markets to attract investors that people would want to invest in, and that's where financial engineering came to the rescue again.

A huge fund starting from scratch

Borrow some money or issue stock to generate cash flow

It's used to buy a large portfolio of drug developments that they need, and those drugs go through the approval process, increasing in value as they move through the stages of approval, most of them failing.

Some will succeed, and if they gain value, they'll sell, and by selling them, they'll be able to pay the interest on the bond, and they'll also have the money to invest in the next test -- mostly their own money.

follow a series of deals

And when you're done, you can liquidate your portfolio, collect your debts, and reward your shareholders.

The rationale was this, we talked a little bit, we did a lot of experiments, and then we decided to actually try it.

I spent two years researching

I've spoken to many pharmaceutical finance and venture capital experts.

Talk to drug developers

I also talked to pharmaceutical companies.

Over 2,000 approved, unapproved, and dropped drug data were actually read and simulated millions of times.

you spent a lot of time

The result was a bit of a surprise.

It's actually possible to create a suitable funding structure, and you can create a bond that's actually attractive to creditors, low risk, that's actually attractive to creditors, at a yield of about 5 to 8 percent, and you can issue a stock with a yield of about 12 percent.

At that level of profit, it's not very attractive to venture capitalists.

They're betting bigger and wanting billions of dollars in payoffs.

But there are a lot of people who are interested in these kinds of investments.

It's right in the so-called "sweet spots" like pension funds and 401(K) plans.

So I published articles in academic journals, medical journals, financial journals.

But it didn't really get noticed until it caught the attention of a well-known magazine.

Not just letting everyone know

We wanted you to participate, so we created a computer program.

We made it available online for everyone under an open source license.

If you want to run your own experiments, you can download it and see if it works.

This worked really well, because people who didn't believe our hypothesis could try theirs and see what happened. Now, the obvious problem is.

Is this money enough in the world? is

I said earlier that we have enough drugs, but what about the money? I said earlier that we have enough drugs, but what about the money?

Right now, there's $100 trillion of money invested in fixed income bonds.

100,000 times a billion dollars

that's a lot of money

(Laughter) I had more money than I needed.

We had to motivate people, get them involved, and make them understand how this works.

So I started thinking about the factors that might go wrong.

What are the obstacles in implementing it?

make a long list

A lot of people, including us, shared a lot of this task.

Can you start with credit risk?

Can you start with the legal side?

And for some people, how do you manage so many projects? about

We brought these experts together and worked on a variety of issues, and we held a conference.

Last summer, it was an invitation-only conference.

Last summer, it was an invitation-only conference hosted by the American Cancer Society.

It was done in partnership with the National Cancer Institute.

We brought in experts from every field that we thought were important, including people from the government and research institutes. Over the course of two days, we listened to and discussed five research reports to make this drug development investment a reality.

It was the first time that potential people sat down to talk.

At these conferences, there's usually a dinner, and it's at dinner that we get to know each other, just like we do now.

And then I looked out the window, put my hand on my chest, and looked out, and on the night of the conference -- daylight savings time -- I saw a double rainbow.

I hope this was a good sign

Since that conference, I've been working with people from all walks of life, from Paris to San Francisco, exploring the possibilities.

The fund hasn't started yet, but I'd like someone to do it.

Because, again, I'm not a scientist.

can't make medicine

I don't have enough money to invest in any one of these tests.

But if we all do it together, with our 401(K)s, 529 plans, pension plans, we can do hundreds of tests, we can reap the benefits, we can save tens of thousands of lives, just like my father.

thank you

(applause)

this is an image of the earth

It's very similar to that famous photo taken from Apollo 17, isn't it?

But it's a little different. This image is clickable, and you can click to zoom in to almost any point on the planet.

For example, this is an aerial view of the campus of the Polytechnic University of Lausanne (EPFL).

In many cases, you can also see what the building looks like from a nearby street.

it's really great

But there's one thing missing from this wonderful tour: time.

I don't know when this photo was taken

I don't even know if it was taken at the same time as the aerial photograph.

In my lab, the tools we're developing allow us to travel not just through space, but through time.

The question we're asking is, can we build something like Google Maps of the past? Can we make something like Google Maps in the past?

So, can't we put a scrollbar at the top of Google Maps so that we can go back in time? How it was 100 years ago or 1000 years ago

can't you make it visible?

Is it possible to recreate the social networks of the past?

Can we create a medieval Facebook?

Can't you make a time machine?

You could just say, "Impossible."

But what if we think about it in terms of information?

This is what we call "mushroom information."

time on the vertical axis

This is a graph showing the amount of digital information accumulated on the horizontal axis.

It's pretty obvious that there's been a lot of information in the last 10 years.

And as we go back in time, the information diminishes.

In order to make Google Maps of the past or Facebook, you need to expand this part to make it just a rectangle.

What should I do?

one is digitization

There's a lot of material -- newspapers, books -- thousands of books.

digitize them all

you can extract information from it

Of course, the further back in time you go, the less information you have.

may not be enough

So like historians

We make an "estimation".

In the world of computer science, it's a simulation.

Let's say you have a logbook here, not just a logbook of a Vatican captain's voyage.

I think that what is written in that journal is a representative example of the many voyages that were made at that time.

This is how we estimate

If there's a drawing that depicts the exterior of a building, we don't just attribute it to a particular building, but perhaps the same structure was used in other buildings for which we don't have enough information.

So to build a time machine, you need two things.

Massive archival records and excellent professionals.

I'd like to tell you about a project called the Venice Time Machine, a joint project between the Lausanne Polytechnic University and the Ca' Foscari University of Venice.

What's unique about Venice is that the government has always been very bureaucratic.

It's been recording everything, like Google is today.

The Venetian Archives has 80 kilometers of vaults, documenting all aspects of Venetian life for over a thousand years.

You can see all the ships that have departed and arrived

Every change in the city is recorded

all this information is there

Now, we're making a 10-year plan for digitization, and we're going to turn this vast collection of material into a huge information system.

Our goal is to digitize 450 books a day.

Of course, digitization is not enough, because these documents are usually written in Latin, Tuscan, Venetian dialects, so they need to be transcribed, possibly translated, and indexed, which is by no means an easy task.

In particular, traditional optical character recognition (OCR) methods work well for printed documents, but they don't work well for handwritten documents.

To solve this problem, we turned to the field of speech recognition.

Speech recognition, something that seemed impossible, is now possible by simply adding conditions.

What you need is a good model of the language in use, which is to say, a good model of well-structured documents.

These are administrative documents.

Many are well-configured

If we could sort through the vast archives into smaller pieces, sorting them by similar characteristics, we might be able to do well.

Once you get to that stage, you can do other things, you can extract events from this document.

In fact, perhaps one million events can be extracted from this archival record.

And this huge information system can be searched in many ways.

You can also ask, "Who lived in this palace in 1323?"

"How much did sea bream sell for in the Realto market in 1434?"

“What was the salary of a Murano glassmaker? For example, in the last 10 years.”

You can ask bigger questions, because they're coded according to meaning.

We can also tie it to place, because a lot of the information is related to place.

From there, you can trace the incredible history of this city, the trajectory of the city's sustained development over more than a thousand years, always in balance with its environment.

You can reconstruct the history of a city and visualize it in different ways.

Of course, to understand Venice, it's not just about the city.

We need to look at it in the wider European context.

So record everything that happened in Europe.

You can also recreate the movements of Venice during its maritime empire, how it strengthened its control over the Adriatic Sea, how it became, at the time, the most powerful empire in the Middle Ages, controlling most sea routes from east to south.

We can do other things, because there's a set pattern for these sea routes.

And if we take it a step further and create a simulation system, create a simulator of the Mediterranean Sea, we can reconstruct even the missing information, and we can ask questions like this, it's like talking to a travel agent.

"Where should I take a boat from Corfu to Constantinople in June 1323?"

Perhaps this question can be answered within a day, two days, or three days.

"How much does it cost?"

Another question is, "What are the chances of encountering pirates?"

Of course, as we all know, the core scientific challenge in projects like this is to limit, quantify, and account for the uncertainties and contradictions at each stage of this process.

Errors are everywhere, even in documents, the captain may have been under a different name, and the ship may never have actually sailed.

There will be errors in translation and interpretation, and if we add algorithmic processing, there will also be errors in recognition and extraction, so what we have here is very uncertain data.

So how can we find and fix these inconsistencies?

How can we explain the form of uncertainty?

It's difficult, but what you can do is record each step of the process, and encode not only the historical information, but also the so-called "metahistorical information," documenting how historical knowledge was formed at each step.

This won't necessarily converge the history of Venice, but it will probably allow us to reconstruct the history of Venice entirely from the records.

Maybe there's more than one map

there may be more than one

The system should allow it, because it has to deal with new forms of uncertainty, which are new to this kind of large database.

So how do we get this new research to reach a wider audience?

Again, Venice is perfect for that.

With millions of visitors each year, it's the perfect place to build the museum of the future.

Imagine putting down a reconstruction map of a certain year, and on the wall you can see the materials that were used to reconstruct it, such as paintings.

This immersive system allows you to enter the Venice of the year, recreate it, and share the experience with those around you.

On the other hand, we can start with a document, such as the Venetian manuscript, and then show what can be said about how it was deciphered and in what context the document was reproduced.

Here's an image from a current exhibition in Geneva, using a similar system.

The bottom line is that research in the humanities is currently undergoing an evolution, similar to what happened in the biological sciences exactly 30 years ago.

It's just a question of scale.

These projects go far beyond what a single research team can do, and are unprecedented in the humanities, although we often tend to work in small groups and with just a few researchers.

If you visit that archives, you'll see that it's more than what one research team can do, it should be done collectively.

For this paradigm shift, we need to nurture a new generation of digital classicists. We need to nurture a new generation of digital classicists. They are the right people for this shift.

thank you

(applause)

(Music) If you've ever been to Manhattan, New York, you know this place.

It's Central Park, one of the most beautiful public spaces in America.

But for those of you who haven't been there, this video probably won't do justice to its beauty.

To really understand Central Park, you have to go there.

And it's the same with music. My brothers and I made music that can only be heard in Central Park.

(Music) Today I'd like to talk a little bit about our project. We're brothers. You can see the two of us together in this picture.

My brother and I are musicians, we also produce.

We've been doing a lot of things together since we were kids.

Recently, I've been very interested in projects that combine art and technology, such as site-specific audio and video installations and interactive concerts.

Today, I'm going to talk about the concept of music for a particular space.

Before I get into the details, let me explain how I came up with this idea.

When my brothers and I lived in Manhattan, we experienced an installation called "The Gate" in Central Park by artists Christo and Jeanne-Claude.

A myriad of brightly colored exhibits like this hung in Central Park for weeks. It was nothing like a gallery or museum exhibit.

It was an unforgettable experience. Years later, when we moved to Washington, D.C., we wondered: Is it possible to make music that can only be experienced in a specific location in the same way that "The Gate" did in Central Park?

This is the result

(Music) In May, we released our new location-aware album, "National Mall," which was released as a mobile app that uses the device's built-in GPS capabilities to map locations throughout Washington, D.C.'s iconic national park.

Hundreds of song segments are geographically tagged throughout the park, so the song changes as the listener moves through the park.

So unlike playlists or traditional albums, this is music that can only be experienced in this park, where individual melodies and rhythms seamlessly blend together like pieces of a puzzle as the listener moves.

So the structure of the song is different for each listener.

let me elaborate

I prepared a demo

So when you use the app and walk towards the Washington Monument area, you'll hear a warm-up tune, and then a mellotron playing a simple melody.

violin sounds overlap

As you keep walking, the chorus joins in. Finally, when you reach the top of the hill, you hear the sounds of drums and fireworks, climaxing to a climax.

Walking in the opposite direction reverses this sequence.

When you exit the park, the music fades out and ends, at which point the play button disappears.

I also get inquiries from people who live in other places and can't make it to the United States, wanting to hear this album.

But unlike a regular album, we can't respond to such requests.

There have been requests for a CD or MP3 version, but unfortunately that's not possible either, because this is not your typical vinyl promotional app or game.

In this case, the app is the work itself, and the landscape of the place becomes part of the musical experience.

Six months later, we created a location-aware album for Central Park, which is more than twice the size of the National Mall, and the music extends from this side of Central Park to the other end.

Right now, my brothers and I are doing projects all over the country, and this spring we're doing a new project here at Stanford University's School of Media Arts, the biggest location-aware album to date, which will cover the entire length of Highway 1, the mighty stretch of Pacific Coast.

The fusion of GPS and music that we're doing is just an idea.

But it offers a vision of the challenges facing the music industry in today's digital age. I hope that new technologies like this can be used to enable entirely new ways of experiencing music, rather than just ripping off existing models.

thank you

(applause)

In the big system of capitalism, the economic model in which we do business, both in the past and in the present, Friedman puts it very succinctly at the heart of this model: Corporate social responsibility is profit maximization.

Many years ago, the father of modern economics, Adam Smith, also coined the term "invisible hand," which is to say, "The pursuit of individual self-interest is in the interests of society as a whole."

It's true that capitalism has done a lot, and I've talked about it a lot, but just as capitalism has left our society with challenges.

This economic model, which at least I and many in the business world have been nurtured, aims for what I call the "three growths."

But this alone is not enough, and in addition to this 3G model, we need what we call the fourth G, which stands for responsible growth.

This is what should be most important in creating value.

It doesn't just create economic value, it creates social value.

Successful companies are actually embracing this fourth G.

This 4G model is very simple. Businesses can no longer sit on the sidelines of what's going on in society.

A company needs to play its part in the community and contribute to society because society exists.

We need to move further to an "and/and" model. We need to move further to an "and/and" model. How can we make money and serve society at the same time?

How can you do a great business and also be great for the environment?

This model is about being successful in business and contributing to society at the same time.

Easy to say but hard to do

So what should we do?

I believe that the answer lies in leadership.

So we're redefining a new business model, where companies -- if they can't do these things, they're no longer eligible to do business.

To do that, businesses need to define their role in society, and they need to define their role in society, and not in terms of their products or brands.

Good or bad, it doesn't matter if a company has a goal that really matters, something they can't compromise on.

Because they have the beliefs on which they stand

By defining values ​​and objectives, we will create tomorrow's companies by using them as a driving force on the software side.

Let me change the subject and tell you a little bit about my experience.

I joined Unilever in 1976 as a management trainee in India.

On my first day at work, I went in and my boss said, "Do you know why you're here?"

I answered, "To sell a lot of soap."

My boss continued, "No, it's to change people's lives."

To change people's lives-

I thought you were joking

We are a company that sells soap and soup.

Why should people's lives change?

But it wasn't until then that I realized that even something as simple as selling soap can save more lives than a pharmaceutical company.

Did you know that 5 million children do not reach their 5th birthday due to simple infections that are preventable by washing hands with soap?

We are running the world's largest hand-washing campaign We are running a hand-washing campaign

We also do health and hygiene activities, reaching 500 million people.

They have a greater purpose than selling soap.

And brands can be at the forefront of social change.

Because two billion people will use your brand to spread your message.

small actions make a big difference

Let's take another example: I was visiting villages in India.

Those of you who have experienced it know that it's not as easy as taking a walk.

There was this woman, one of our small dealers, she had a beautiful, very humble home, and she was there, well dressed, and her husband was behind her, followed by her mother-in-law and sister-in-law.

Social status was changing, because this woman is part of Project Shakti, which trains women in running a business, as well as in nutrition and hygiene advocacy.

Now there are 60,000 such women in India Now there are 60,000 such women in India

It's not to sell soap, and by doing so, you're making a difference in people's lives.

Small actions can make a big difference

Our R&D team is working not only to create detergents that remove dirt well, but also to create detergents that use as little water as possible.

In terms of recently sold products, you can save water every time you do laundry with “One Rinse,” which requires only one rinse.

If all users used this, we could save 500 billion liters of water.

By the way, that's enough water for one continent - one month.

so think about it

Here are small actions that make a big difference.

There are many examples

And in the food business, they have great products -- and I apologize for the hype -- Knorr and Hermann are very good products.

Our commitment is to sustainably source all of our agricultural raw materials – 100% sustainably sourced.

We are the first to commit to switching all palm oil to sustainably sourced

I don't know if you know, but if we don't source palm oil sustainably, it will lead to deforestation, which is said to be equivalent to 20 percent of the world's greenhouse gases.

We were the first to bring it in, and it's all because we sell soaps and soups.

What I'm saying is that your company, and companies like ours, should embrace social responsibility and have a purpose that embodies an understanding that we have a role to play in the society in which we operate.

The business strategy we've implemented is called the Unilever Sustainable Living Plan, which aims to transform the lives of more than a billion people by 2020 with the goal of advancing sustainable living environments.

The question here is how do we move forward?

The answer is very simple, we will not change the world alone.

There are many people who understand this, including you.

So -- we need partnerships, we need collaborations, and more importantly, leadership -- the kind of leadership that we all expect from here to lead to change.

thank you

(applause)

It's my pleasure to speak here in Edinburgh, Scotland, the birthplace of needles and syringes.

In this direction, less than a mile from here, in 1853, a Scotsman applied for the first patent for a needle and a syringe.

His name is Alexander Wood, and he's applied to the British College of Physicians.

this is the patent

I was very surprised to find that it was no different than the needles we use today.

160 years have passed since then

Now let's think about vaccines

Using the same equipment as 160 years ago, we administer vaccines with needles and syringes.

In many ways, vaccines are a successful technology.

Along with clean water and sanitation, vaccines are the most life-extending technology.

it's pretty hard to get past this

But vaccines, like any technology, have their shortcomings. Needles and syringes are a big part of the shortcomings. They're old technology.

It goes without saying that many people don't like needles and syringes.

I know how you feel

Yet 20 percent of people have a needle phobia.

It goes beyond needle aversion to needle phobia and actively avoids vaccinations.

That's the problem with vaccine deployment.

And a major problem associated with this is needlestick injuries.

According to World Health Organization statistics, about 1.3 million people die each year from cross-contamination from needlestick injuries.

cause premature death

I'm sure some of you are familiar with these two problems, but there are two other drawbacks of needles and syringes that you may not have heard of yet.

The first is that it can interfere with next-generation vaccines in the immune response.

Second, it could be creating a cold chain problem.

I'm going to tell you about the research that my team is doing at the University of Queensland, Australia, on technologies that address four problems.

It's a technology called Nanopatch.

Here is a sample nanopatch

To the naked eye, it looks like a square, smaller than a postage stamp, but under a microscope, you can see thousands of tiny bumps invisible to the human eye.

Compared to a hypodermic needle, this square has about 4,000 tiny protrusions.

I designed these protrusions to work with the skin's immune system.

That's a very important function associated with nanopatches.

We create nanopatches using a technique called deep reactive ion etching.

This particular technology was borrowed from the semiconductor industry, so it can be mass-produced at low cost.

Dried vaccine is attached to the nanopatch protrusions and attached to the skin.

It's very easy to apply with your fingers, but there are some limitations, so I made a device to apply it.

It's so simple, you could call it a fine finger.

spring-loaded

Apply the nanopatch to the skin like this (click) It works immediately after application

First, the projections of the nanopatch pierce the tough skin epidermis, delivering the vaccine rapidly, in less than a minute, in fact.

Then peel off the nanopatch and throw it away.

Application equipment is reusable

I hope you quickly understood the concept of Nanopatch and its key benefits.

Nanopatches don't need needles, they use invisible bumps, and of course avoid the problem of needle phobia.

Let's consider two other important benefits: the first is an improved immune response upon injection, and the second is the elimination of cold chain.

Let's start with the first one, immunogenicity.

It's taking me a while to get my head around it, so I'll explain in simple terms.

I'll give you a brief explanation of how the vaccine works.

Vaccines work by introducing safe pathogens, or substances called antigens, into the body.

Safe pathogens, or antigens, trigger the body's immune response to learn and remember how to deal with pathogens.

When a real pathogen enters the body, the body immediately mounts a vaccine-primed immune response to stop the infection.

that's why it works

Needles and syringes are still used today, and it's this traditional technique, and the needle, that administers most vaccines.

Some argue that the needle blocks the immune response, because we don't know where in the skin the immune response is high.

To explain this idea, we need to look at the skin, if you put a nanopatch on your skin, and you start with one of those bumps.

I get data like this

This is real data, one of the projections from the nanopatch on the skin is shown on the screen, and the cell layers are color coded.

To give you an idea of ​​size, if the needle is right here, it's too big.

It's 10 times bigger and 10 times deeper than the screen size.

Doesn't fit on screen

You can immediately see the bumps in the skin

The red layer is the tough outer layer of the stratum corneum, while the brown and magenta layers are packed with immune cells.

As an example, this brown layer contains immune cells called Langerhans cells in abundance all over our body surface, and there are other immune cells that aren't stained in this image.

You'll see that the nanopatch is inserted correctly.

It targets thousands of specific cells from the surface of the skin to as deep as the thickness of a hair.

Now, as the inventor of the nanopatch, I'm excited about this result, but what is it?

What does it mean to target cells?

What does it mean in the world of vaccines?

The world of vaccines is evolving day by day.

Systematization is in progress

But you have to roll up your sleeves and take the vaccine and wait a while before you know if it works.

Even today it's a gamble of sorts.

So I had to make a bet

I got the flu vaccine. I applied the vaccine to a nanopatch, then applied it to the skin and waited for it to work. I tried it on a live animal.

This is the result of a month-long study.

Here's a graph comparing the immune response with a nanopatch versus an intramuscular injection with a needle and syringe.

The horizontal axis is the dose in nanograms.

The vertical axis is the immune response The dashed line is the protective threshold.

Above the dashed line is protected Below the dashed line is unprotected

Most of the red line is below this line, and only one point was able to achieve protection with a needle, and that's at a dose as high as 6,000 nanograms.

It's pretty obvious that the blue line has a completely different curve.

And that's what the nanopatch is doing. Nanopatch doses show a completely different immunogenicity curve.

felt so fresh

Suddenly, in the world of vaccines, we got a brand new tool

We've opened the door to the unknown. Conventional needles are too expensive to make vaccines effective, but nanopatches can be 1/100th the dose.

Vaccines suddenly went from 10 dollars to 10 cents, which is especially important in developing countries.

And you can also look at it the other way, by raising the threshold of a currently ineffective vaccine so that it can protect you.

And that's going to be important in the world of vaccines.

Let's look at the three major diseases: HIV, malaria, and tuberculosis.

Seven million people die each year, none of which have an effective vaccine.

So why not try the new Nanopatch, because I think it can help.

push the efficacy of those vaccines above the threshold line.

In my lab, we're also working with different vaccines, and we're getting similar responses and curves that we've had with the flu example.

Now, I want to talk about another drawback of today's vaccines, the need to maintain cold chain distribution.

As the name suggests, the vaccine needs to be kept cold all the way up to the point of injection.

There are distribution problems, but there is a way.

This is a great example, and it illustrates the logistical problem of keeping vaccines cold and keeping them cold-chained, especially in the less well-equipped.

If the vaccine is too warm, it's going to go bad, but the funny thing is, if it's too cold, it's going to go bad.

It will be very difficult if the vaccine becomes useless.

According to the World Health Organization, up to half of the vaccines used in Africa don't work properly because cold chains are broken somewhere.

It's a big problem, and it's related to needles and syringes, because vaccines are liquids, and liquids need to be refrigerated.

A key attribute of the nanopatch is that the vaccine is dry, so it doesn't need to be refrigerated.

In my lab, I've shown that the vaccine can be stored at 23 degrees Celsius for over a year without losing its activity.

it is an important advance

(Applause) We're happy with the results.

This means that the effectiveness of the nanopatch has been fully proven in the laboratory.

As a scientist, I love being a scientist and I love science.

As an engineer, as a biomedical engineer, and as a human being, I'm not going to be satisfied until I've deployed this outside of the lab and vaccinated a lot of people, especially those who need it most.

And that's why we're trying to spread nanopatch, we're trying to spread it in a weird way.

Started in Papua New Guinea

I gave Papua New Guinea as an example of a developing country.

It's the size of France, but it suffers from many of the obstacles that exist in today's world of vaccines.

There's a distribution problem. Papua New Guinea has only 800 refrigerators to cool vaccines.

Like this refrigerator in Port Moresby, it's old, it's broken, it's not up in the highlands where it's needed.

Difficult but worth it

HPV, the human papillomavirus, is a [risk factor] for cervical cancer, but the infection rate in Papua New Guinea is the highest in the world.

We can't give the vaccine to many people because it's too expensive.

To solve these problems, we're going to go out there and deploy nanopatches in Papua New Guinea and we'll do a follow-up soon.

this kind of work is not easy

It's a challenge, but I see it as my mission.

As I look to the future, I'd like to share with you my thoughts that one day, the fact that there are 17 million people who die each year from infectious diseases today will be a thing of the past.

And that past story is achieved by dramatically improved vaccines.

So today, I'm standing here in front of you in the 160-year-old birthplace of needles and syringes to talk about another approach: nanopatches. No needles, no pain, no cold chain, and enhanced immunogenicity.

Thank you for your attention

(applause)

Pat Mitchell: TEDWomen hasn't been on stage since then.

Sheryl Sandberg: It's great to see you all again, to see so many women here.

I'm sure everyone is too, but I don't usually do that, so I'm happy

When you asked me to speak at TED, I thought you were going to talk about social media, but surprisingly, what was on your mind was the missing female leaders, especially in the areas of technology and social media.

How was that sublimated in you and how did it come to fruition in that TED talk?

At the time, I was terrified to talk about women here because, like all of you, I've been in business all my life.

I never say anything about women

If you mention the word "woman," the people across the table might think you're asking for favors or complaining.

And you're trying to sue me, so -- (Laughter) I had never mentioned or spoken publicly about being a woman in any professional setting.

At the same time, I knew it wasn't good.

When I graduated from college over 20 years ago, there were women in my class, but everyone above me was male.

As time went on, my circle of friends dwindled, and now -- I'm often the only woman in the conference room.

So I asked a lot of people what they thought: Should we talk about women at TEDWomen? the answer is no

"It's going to ruin your career," "That's not what corporate executives do," and "You're not going to be taken seriously."

Luckily, I had a few proud followers like you, so I asked myself, as Mark Zuckerberg, my boss who founded Facebook, would ask us, "What can you do if you're not afraid?"

My answer was to get on the TED stage and talk about women and leadership.

Right before the show, I told him to talk about it on stage.

It was - can you talk to me?

That was a big moment on this trip. Originally, TEDWomen was in Washington, D.C., and I flew from there the day before, and my daughter, who was three years old at the time, was clinging to my leg and saying, "Mommy, don't go."

I told Pat, because he's my friend, but the talk I had planned was completely different. It was all facts and figures, nothing personal.

Yesterday my daughter was clinging to my leg and crying for me not to go."

Pat said, "Tell me that story."

I was like, "On stage at TED? Are you kidding me?"

"Would you like me to go up on stage and tell you my daughter is holding onto my leg?"

You said yes, if you want more women leaders, you should be honest about how hard it is.

So I told that story, and it was a pivotal turning point in this journey.

When I wrote the book, the same thing happened. I started writing the first chapter, and I was happy with how it turned out.

My husband read it and said, "I'm full." (Laughter) No one reads a book like this.

So I realized that I had to be more honest and open and talk about myself.

Even now, I still feel alienated and guilty

My journey began at this stage, leading to Lean In and the founding of organizations, but the important thing is to be more open and honest about these challenges, to show ourselves so that other women can do the same, and that we can all work together towards true equality.

I think one of the reasons your book is the most moving - and I think one of the reasons why it has resonated with people all over the world - is because you're very open about yourself, you're not hiding it - you know what other women need to know is very important - and you write about the challenges that many of us face.

Now, when you decided to expose your private side, you became kind of an expert in solving these problems.

What happened after the TED talk -- I never thought I'd write a book -- I'm not a writer, I'm not a writer -- and the talk started playing over and over again and impacting people's lives.

Not long after, I received a wonderful letter from a woman who told me that she had turned down a big promotion at work and told the story to a close friend, who urged me to do this TED Talk.

And the next day, she got a promotion, and when she got home, she gave her husband a shopping list. (Laughter) "I can do this."

What was important to me was that it wasn't just women in business.

I met with a doctor who is a preceptor at Johns Hopkins Hospital -- he saw my TED Talk and realized for the first time that half of his medical students were women, but women weren't speaking as much during rounds as men.

When he looked carefully, only men raised their hands when asked questions.

So I told the woman to raise her hands more, but it didn't work.

So I told everyone that we're going to nominate people instead of the show-of-hands system.

They guessed men and women equally, and they found that the women did as well or better than the men.

And then there was this woman who was a stay-at-home mom and didn't have a good school in her neighborhood. Although she had never worked for a company, she was inspired by my TED talk to go to school and start negotiating to get a good teacher for her child.

I think I was trying to speak up then.

It gave other women and men a voice, and after the talk, I started writing.

You spoke up, as the book clearly and strongly shows, but you also shared what you learned and shared the experiences of others.

That's what I was thinking -- I think you've become an expert in leaning in.

how did you feel? what does it mean in life

I didn't just put out books, bestsellers, and popular talks, I started a movement, and I literally began to call my behavior in the workplace "lean in."

I'm very happy and honored. That's just the starting point.

I don't know if I'm an expert or if there are any experts, but I did a lot of research.

I read all the research, I read the material, and the lesson was very clear. What I do know is that all over the world, stereotypes keep women from becoming leaders.

Shockingly, "lean-in" is global.

Even in Japan, Japan, Korea, China, Asia, Europe, they are all completely different, but the gender is the same.

In every culture around the world, men are supposed to be strong, assertive, assertive and vocal, while women are supposed to speak only when asked and help others.

And all over the world, women are said to be "bossy."

I wouldn't use that word for boys. There's no negative word for a boy leading because it's a given, but a girl is "bossy."

Men are in the minority here, but please bear with me.

If you are a male, please use the male representative.

Have you ever been told you were too aggressive at work?

(Laughter) Well, it's 5%. Men, please be prepared.

Have you ever been told by a woman that you are too aggressive at work? (smile)

Everywhere in the world, I heard something like this, and it's well backed up by data.

Are women more aggressive than men? no of course not

It's just looking at people through colored glasses. If you're a man, you're seen as a "leader," but if you're a woman, you're seen as "bossy."

Fortunately, acknowledging this changes us.

One of the happiest moments of my trip was when I stood on stage with Cisco CEO John Chambers after publication.

He'd read my book, and he invited me in front of a management team that I was with, who also had women, and he said, "We thought we were open-minded, and I wasn't.

But after reading this book, I realized that we, my company, were saying that all female managers were too aggressive, so I took this stage to apologize.

I promise not to repeat the same thing."

(Applause) John's statement is for the good of the company.

So if someone calls a girl "bossy," go to her and put a big smile on her face and say, "She's not boasting, she just has managerial leadership."

The reason you focused on the book and wrote the book was to encourage dialogue.

In other words, let's expose the problem and face the facts, the fact that in an era of so many doors and so many opportunities, women are still far from being leaders.

It's been a few months since the book was published, and "Lean In" focused on this reality, and suggested that many of the challenges still remain, but that we should look at ourselves and take a look at ourselves, and what has changed since then?

Have you seen any changes?

There's definitely more dialogue, which is great.

But for me, no, what really matters to all of us is action.

Everywhere I go, CEOs -- most of them men -- tell me, "You're going to cost me money because all the women want the same pay as the men."

My answer is, "Not bad at all." (Laughter) Absolutely not.

Everywhere I go, I hear women say, "I want a raise."

Everywhere I go, I hear women say things like, "My marriage is getting better," or, "I want more help with housework, I want a promotion at work."

One governor told me that he didn't realize that many of the women were literally sitting in the corners of the room, and now he's decided to put all of his female staff at the table.

The organization I started with the book, Lean In, is helping women and men form small groups -- circles -- that can be 10 or more people -- and they all meet once a month.

I thought it would be great if we could have 500 circles by now.

It's about 10 people multiplied by 500.

In fact, there are more than 12,000 circles in 50 countries around the world.

That's wonderful

Among those who meet every month without fail

I met a group in Beijing.

It's a group of women aged 29 or 30, the first lean-in circle in Beijing, some of them from very poor rural areas.

The 29-year-olds are what people call "leftovers" because they're not yet married.

It's about what you want in your career and what kind of partner you want.

They took turns introducing themselves to each other, and each of them said their name and where they were from.

i started crying

yes i cry i told you before

A woman who grew up in a rural village far from the center of the world was told to marry someone she didn't want to marry.

This is the change we want

Have you ever been surprised that this message is universal?

When this book came out, I think a lot of people thought that it would be an important textbook for young women to navigate through life.

It's the young women who need to face this problem, to anticipate and recognize the obstacles that are coming, to talk openly about them, and that's exactly what these women, even those who go on to pursue careers in the business world, are doing.

The book is now being read in rural and developing countries.

Did anything surprise you? you will have a new feeling

This book is about confidence and equality.

After all, women all over the world need to be more confident, people say we're different than men.

Everywhere in the world, men can combine work and home, but women can only do one or the other.

(Laughter) So again, I'm going to ask the men in the audience how you manage to juggle work and family. Who's been asked?

(Laughter) Only men.

Ladies and gentlemen, if you asked me how I balance it?

It's natural for a man to be able to do both. He can have a job and have children.

But women can't, which is crazy, because the vast majority of women, in America and everywhere in the world, work full-time and have children.

People really don't understand the gravity of this message.

There's a gathering for ex-sex workers in Miami.

We're using "Lean In" to help people get back to life with a future, helping them out of pimps.

A Texas Dress for Success group is using this book to help high school-educated women find employment.

There are circles in Ethiopia, far away.

These messages of equality -- how women are told they can't do it, how they say that leadership and voice belong to men -- they affect all of us, and I think they're very universal.

So does TEDWomen.

It brings us together for a cause we believe in: more women, louder voices, more equality.

And if you were invited to speak at TEDWomen, what would you personally take away from this experience and what would you learn about women and men on this journey?

Well, what I want to say strongly - and I think I can say it even more strongly - is that we should not settle for the status quo.

The status quo is not good enough, and change is not fast enough.

After the TED talks and books were published, new statistics from the US Census came out.

What do you think?

The gender pay gap in America hasn't changed at all.

77 cents for every dollar for men

64 cents for a black woman

If you're a Latino woman, it's 54 cents.

When was the last time these numbers went up?

it's 2002

It's been stagnant, in many ways

I don't think we're being honest about this, for many reasons, and gender is a tricky thing to talk about.

I shy away from the word "feminist" when I should really accept it.

I think we need to get rid of the word "bossy" and put it back -- (Applause) I want to make a point here, but we should get rid of the word "bossy" and bring back the word "feminist" because we need it.

(Applause) We all need to do more.

take more steps

thank you cheryl

for taking a step

thank you

(applause)

I had no problems until two years ago.

Because I knew what an icon looked like.

This is what an icon looks like

Like most of you, it's a standard icon for me, as a curator of Italian Renaissance painting.

or this would also be standard

It's Leonardo da Vinci's soulful and graceful work - Lady with an Ermine.

Dare to say "I put my soul into it"

And then this work -- the two "Madonna of the Rocks" -- just before they were exhibited together for the first time in London.

Preparing for this exhibition was really hard.

I literally spent three years immersed in Leonardo.

That's why Leonardo was on every corner of my head.

What I learned from him during those three years was the possibilities of painting, namely

It's about taking people out of the everyday material world into the spiritual world.

Leonardo said that it is the painter's job to paint everything in the universe, including the invisible.

he managed to accomplish the feat

what he expresses is

A human soul and the ability to reach the realm of the soul ―

The ability to imagine a more perfect universe—

Or you could call it the ability to know God's true intentions.

So that was the icon I believed in

Around that time, I approached Tom Campbell, director of the Metropolitan Museum of Art, about a career change.

It was about returning to the three-dimensional world, the world of sculpture and decorative arts, which I had been working on earlier in my career at the British Museum, and taking over the Metropolitan's Department of European Sculpture and Decorative Arts.

It's just a busy time

We could only talk over the phone and at odd hours.

I ended up accepting the job without ever visiting.

I had the opportunity to visit a few years ago, but it was on other business.

So just before the opening of the Leonardo exhibition, I finally went to the Metropolitan Museum of Art in New York.

I was able to leave my Renaissance work behind and see what my new workplace was like in the European Department of Sculpture and Decorative Arts.

I thought I'd take a tour of the gallery on the first day.

It's got 57 rooms.

Start in the most tranquil Italian Renaissance area

I looked at it in order, but sometimes I thought I was lost

Just before the opening of the Leonardo exhibition, I was preoccupied with what I saw.

At that time, I thought, "I did it!"

Nothing touched my heart, and if I had any emotion, it was just a kind of disgust.

This object looked terribly bizarre

There's a limit to being silly

And to make matters worse, there were two of the same thing.

(Laughter) And that led me to analyze why this object was so disgusting.

Where does this loathing come from?

First of all, I spend too much money and it's vulgar...

To be frank, it's a no-buy hobby

Leonardo warned against using gold, so it was an absolute taboo for me at the time.

And then there's the pretty floral decorations sprinkled in. (Laughter) And this goddamn pink...

It's a very artificial color.

Nothing you see in nature should have these shades.

This object even has a tutu on it.

This reminds me of my niece's fifth birthday party.

All the girls came dressed as princesses or fairies.

There was even a fairy princess

It was a sight to see

(Laughter) And then I realized that out of the same spirit, in the same womb as this object, was a Barbie ballerina doll. (Laughter) And this elephant.

This is nothing like an elephant walking majestically in Serengeti National Park.

(Laughter) But there was something more important.

These objects seemed to me and my liberal-left friends in London to embody the very misery of 18th-century French aristocracy.

If you look at the label, it's porcelain made in the late 1750s at the National Sèvres Porcelain Manufactory, designed by Jean-Claude Duplessis, who, as I later learned, was a very talented artist.

But to me, it seemed to me that it was a perfect example of how 18th-century aristocracy was pretty boring.

My colleagues and I have always thought that if we saw this object, it would make sense to start a revolution.

On the contrary, I even thought, "Long live the revolution!"

If you have a vase like this, what awaits you is determined to be this fate

(Laughter) I was horribly disgusted by the place.

But after I accepted the job, I kept looking at this vase.

The only way to get around the museum was through it.

Wherever I go I pass by

It had an uncanny fascination, akin to being captivated by a car accident.

I can't look away

And then I started to wonder, what could this object actually be?

So I first tried to think of this design as a masterpiece.

it took some time

It took some time, but just looking at the tutu has a unique sense of dynamism.

It's very light, yet has an amazing balance.

This work has such a sculptural element.

What's more, the effect of the meticulously arranged colors and coatings on the sculpted surface is truly spectacular.

Also, it seems that it is necessary to put it in the kiln at least four times to finish this work.

There must have been a number of failures leading up to completion.

And it's not just one, it's two.

The craftsman had to make two identical vases.

And is this useless?

Originally, the elephant's trunk was a candle holder.

There must have been candles on either side.

Imagine the effect of light on a vase

Effect on slightly shaded pink and beautiful gold...

I'm sure it would have sparkled in the room like a small firework

At that moment, fireworks went off in my head as well.

This object embodies the word "fancy," which is said to have the same etymology as fantasy.

this is a product of imagination

A delightful opera set in the 18th century Orient,

The moment you think of an opium den or an illusion of a pink elephant, you begin to understand this object.

This is just an object to escape from reality.

The theme is escapism, and the French aristocracy deliberately sought escapism to distinguish themselves from the masses.

It just doesn't fit the modern sensibility.

Ultimately, I've come to believe that we are all victims of the triumph of modernism, where form is dictated by function, and function is meant to follow form.

Veneer decoration is considered an absolute sin.

A triumph of bourgeois values ​​rather than aristocratic values.

I don't think it's a bad thing

The only problem is that it robs you of your imagination

Much like in the 20th century, many people thought that faith was something that happened only on the Sabbath, and that the rest of the day was spent doing everyday things like washing clothes and straightening your teeth.

I think it's the same for us today.

Fantasies are allowed only in front of the screen-

Only in the dark of a movie theater or in front of a TV.

We've stripped away the imagination that these vases represent in our everyday lives that have always been around us.

It may be time to reclaim your imagination.

The Restoration of Imagination is Beginning

For example, in London, as you can see, in the last few years there have been some interesting buildings.

Science fiction-inspired buildings turn London into a fantasy playground.

Great views from skyscrapers

there are opponents

They call it "Gherkin (Pickle)", "The Shard", and "Walkie Talkie" and try to drag it down into the world.

The idea is that imaginative journeys are so anxiety-provoking that they're unnecessary in everyday life.

But I am glad that I met this object.

(Laughter) I found "him" when I was doing some research on the internet.

he was there then

Unlike the pink elephant vase, I fell in love at first sight

I ended up getting married. I bought it.

now decorates my office

Made in Staffordshire, mid 19th century

This is Edmund Keene, who plays Shakespeare's Richard III.

It's actually a copy of fine porcelain

I liked the multi-layeredness that he had at the level of art history.

but i love him more than that

It would have been impossible if I hadn't encountered the pink Sèvres vase at that time.

his orange and pink pants are nice

I also like how it looks like he's dressed up and ready to go to battle.

Red cheeks are a sign of good health

In a way he's my alter ego

It's a little bit more dignified, but it's more vulgar in general.

He came into my life thanks to a pink vase from Sèvres.

And this object, rather than Leonardo, is a better companion for me, sitting still in my office, on the journey of imagination.

I encourage you all to visit museums to see objects, to take them home, to discover them yourself, and live your own imaginative life.

thank you

(applause)

My job is to design, build, and research robots that communicate with humans.

The impetus wasn't robotics, it was animation.

When I first saw Pixar's Luxo Jr., I was struck by how something as mundane as a desk lamp could be made so emotionally rich.

By the end of the movie, you'll be really emotionally attached to the desk lamp.

(Laughter) So I wanted to learn how to do this.

I made the worst career choice.

This is what my mother was like when she found out about my decision

(Laughter) So I quit my tech job at a software company that I was used to, and moved from Israel to New York to study animation.I moved from Israel to New York to study animation.

In New York, I lived with my roommate in a run-down apartment in Harlem.

"Almost broken" isn't a metaphor, it's really about the living room ceiling collapsing.

Every time a report about a building code violation in New York would show a video of our apartment, it was a perfect example of how bad things could get.

I went to school during the day, and at night I used to draw animation frame by frame with a pencil.

I learned two surprising lessons there.

One is that when it comes to expressing emotions, it's not so much how things look, it's how they move, and when and how they move.

The second is what one teacher told me

Was in charge of Weasel in "Ice Age"

That teacher said, "An animator is an actor, not a director."

If you want a character to do the right thing, don't think with your head, use your body to find the answer.

You stand in front of the mirror, you act out yourself in front of the camera, you find out what you want, and you let the character act out it.

A year later, I was in the Robot Life Research Group at MIT.

It was the first group to study the relationship between humans and robots.

I really wanted to build a desk lamp.

But the robots back then didn't move like that, but the robots back then didn't move like that, and it wasn't animation.

On the contrary, the robot was -- it was kind of like a robot.

(Laughter) So I decided to use what I had learned in animation school to build my own robotic desk lamp.

Frame by frame, I tried to make this robot as graceful and inviting as possible.

Here's the robot playing with me on my desk. Actually, here I am, redesigning the robot, and the robot is helping me without even knowing it, digging its own grave.

(Laughter) I didn't want it to feel mechanical, so I wanted to shine the light, like the quiet, capable assistant who shines the light, like the quiet, capable assistant who's there when you need it, and doesn't overdo it.

For example, if I lose my battery and I can't find it, for example, if I lose my battery and I can't find it, it casually tells me where my battery is.

this is where i'm having trouble

Sorry for my bad acting

What I want you to notice is that the same machine can appear kind and caring, or it can appear violent and defiant, depending on how it moves.

It's exactly the same thing, just it works differently.

"Do you want to know? Shall I tell you?

he's dead

I just lay there and my eyes are empty.”

(Laughter) But graceful movement is only one of the necessary building blocks of human-robot interaction.

At the time, I was doing my PhD research on human-robot teamwork, when humans and robots work together as a team.

I was studying teamwork from engineering, psychological and philosophical perspectives when humans and robots work together as a team.

So I could easily imagine the robots that I would be with in the near future.

After the Jewish "Passover" we

I was surprised at how quickly we found our rhythm as we were putting away our folding chairs.

Everyone played their part and there was no division of responsibility.

It just happened, without even having to put it into words.

So I thought, here's the difference between humans and robots.

The interaction between humans and robots is like chess, and the interaction between humans and robots is like chess.

Humans just wait until it's their turn

So it's chess. Chess is for mathematicians and computer scientists, so it certainly makes sense.

Because it's all about decision-making and planning

But I didn't want the robot to look like a chess player, but more like a colleague who could get along and work together.

So I made another terrible career choice: I decided to study acting for a semester.

I dropped out of my doctoral program and took acting classes.

I've actually been in a play, and I hope that video hasn't been released.

I read all the books about theater, including books written in the 19th century, borrowed from the library.

I also borrowed books from the library that were written in the 19th century. To my surprise, there was only one other name on the loan list, and that was in 1889. (Laughter)

So this book has been waiting for 100 years to be rediscovered by robotics.

The book was about which muscles to move to express the desired emotion.

But it was "method acting" that had the biggest impact on me.

It's a form of acting that became widespread in the 20th century.

In method acting, you don't need to manipulate your muscles, you should use your body to find the right movements, using your sensory memories to recreate your emotions.

We use our sensory memories to recreate our emotions, we think with our bodies, we find the right expressions, we improvise with our co-stars.

When I found out about this, I was just reading about one of the leading theories in cognitive psychology, "embodied cognition," and it was the same idea.

We use our bodies to think. Rather than our brains being used to think and our bodies being used to move, our bodies work with our brains to determine how we behave.

It was like being struck by lightning

I went back to my office and finished writing a thesis, which I haven't made public, called "Acting Courses for Artificial Intelligence."

I then spent another month putting on the first ever human-robot theatrical play.

That's the video you saw earlier of the robot and the actor.

So I thought, how can we model artificial intelligence -- how can we model the idea of ​​ad-libbing with computational computation? It's a model of taking risks, taking opportunities and even making mistakes.

Now the robot will be a better teammate.

I've spent a lot of time working on this model, and I've put it into a lot of robots.

Here's a very early example of a robot trying to mimic my movements using this embodied artificial intelligence.

it's like a game

let's take a look

If you try to outsmart them, you can easily trick them.

It's a bit like actors trying to mimic each other's movements and trying to get in sync with each other.

So we did an experiment where we asked people on the street to use this robot desk lamp to test embodied artificial intelligence.

I put two brains on the same robot.

So we put two brains in the same desk lamp, which means we put two brains in the same desk lamp.

Half of the subjects used, so to speak, traditional programmed robotic brains.

Robots wait their turn, analyze and plan.

Let's call it the "computational brain"

For the other half, I prepared the brain to take risks like a stage actor.

Let's call it the "Adventuring Brain"

Our brains sometimes work without all the calculations,

Sometimes I make mistakes and fix them

We've had these robots do tedious tasks that take 20 minutes and we have to do them together, like a factory job, a simulation of doing the same thing over and over again.

As a result, the robots that everyone liked were those with adventurous brains.

They were smarter, worked harder, and contributed more to the team's success as good team members.

It was even called "he" and "she," while the computational brain was called "it," and no one treated it as a human being.

People who have worked with adventuring robots have said, "We ended up making friends and high-fiving each other."

well ok

(Laughter) It's going to be painful.

On the other hand, people who worked with computational brains said they were lazy assistants.

Robots only do what they're supposed to do. And that's what people expect from robots, but I was surprised to find that everyone seemed to have higher expectations than the robotics experts.

Maybe we're at that point in time, just as method acting changed 19th-century acting, from being calculated and doing things to being more instinctively taking risks and embodying emotions.

A few years later, at Georgia Tech in Atlanta, I was doing my next research, and I had a group working on robotic musicians, and a group working on robotic musicians.

Music is a great place to test teamwork, coordination, timing and improvisation, and this robot is playing the marimba.

A marimba is basically like a big xylophone.

When I was working on this, I saw another piece of human-robot improvisation, and there are other human-robot improvisations, but it still kind of looked like a chess move.

A human plays, a robot analyzes it, a human plays, a robot analyzes it, and it thinks of its part on the fly.

This is what musicians call "call-and-response," and this is what musicians call "call-and-response," for robots and artificial intelligence.

But if you apply the ideas that you used in theater and teamwork studies, but if you apply the ideas that you use in theater and teamwork studies, you can have a robot and a jam session like a band.

I thought it might be possible. On the spot, each other riffed and didn't stop even for a moment.

So what I did in acting, now I tried to do it in music. Robots don't know what they're going to play. Robots don't know what they're going to play.

When you improvise, you don't know what you're doing, you just play. You don't know what you're doing, you just play.

I made the robots not know what they were playing, they just played.

A robot listens to a human playing and improvises.

Here, the human musician also sees what the robot is doing and moves along with it.

(Music) (Applause) Musicians don't just make sounds.

A musician communicates with his body, with other members, with an audience, and uses his body to express music.

Since there are already robot musicians on stage, I decided to turn them into full-fledged musicians.

I started designing social brains for robots. I started designing social brains for robots.

This head doesn't touch the marimba, it just expresses music.

These are napkin sketches for a bar in Atlanta, which is dangerously between my lab and my home. (Laughter)

So, on average, I was spending three or four hours a day.

Maybe (laughs)

I went back to animation and tried to figure out not only what the robot musician looks like, but also how it behaves, like someone else doesn't like what they're playing, or represents the beat I'm feeling right now.

Fortunately, we got the funding to build this robot.

I'm going to show you another similar performance, but this time with a robot with social expressiveness.

What I want you to see is the robot playing a beat that matches the human playing, and the human feels like the robot has a mind.

The robot becomes a solo part and changes the way it moves The robot becomes a solo part and changes the way it moves

(music) The robot is looking at me to make sure I'm listening.

(music) Pay attention to the end of this performance

This time, the robot talks to its own body while doing many things, and when it's ready, it joins me in playing the last note.

(music) (applause) Thank you, how much is this—

Did you see how the parts of the body that don't touch the instrument are useful for performance expression?

We were in Atlanta, and one day, someone who looked like a rapper came into the lab, and we invited this rapper in to jam with the robot.

Here the robot is riding the beat

So here the robot is on the beat, and I think you'll notice two things, one is how attractive the robot is when it's moving its head.

I want to move my head along with the robot

Second, the rapper can get hooked on his iPhone, but as soon as the robot turns to him, he's back to playing.

Robots have tremendous power in his peripheral vision, even though they're just in the corner of his vision.

This is because we cannot ignore the moving objects around us.

I'm nervous

So, if you have a friend who's distracted by an iPhone or a smartphone, put a robot there to grab their attention. (Laughter) Put a robot there to grab their attention. (Laughter)

(Music) (Applause) Let me introduce you to the latest robot we've been working on, and I've found something that's kind of surprising.

I just loved the robots enjoying the music. (Laughter)

Instead of saying, "The robot responds to the music," say, "The robot is enjoying the music."

I couldn't help but use this idea, so I designed a new interior.

This time, instead of a desk lamp, it's a dock speaker. It's a speaker that connects directly to your smartphone.

What if the dock speakers weren't just playing music, they were enjoying themselves? (smile)

This is an early animation test. (Laughter)

Here is the completed form

(music "Drop It Like It's Hot")

(Applause) Everyone in the audience was shaking their heads, too.

It's not just a game or a game

One of the reasons I'm so interested in robots that communicate and move with their bodies -- and I'm going to let you in on a little roboticist secret -- is that one day we'll all be living with robots.

In the future, there will surely be robots in your life.

In your child's life, if not in your life

I want these robots to be more eloquent, more social, more graceful than they are now.

To do that, I think robots need to be more like stage actors and musicians than chess players.

Robots should be able to take advantage of opportunities and ad-lib.

can see what you do

Maybe we should also be able to make mistakes and correct them, because we're human after all.

Maybe robots, like humans, are perfect for us if they're a little less perfect.

thank you

(applause)

Some time ago, while in Casablanca, Morocco, I met a young single mother named Faiza.

Faiza showed me a picture of her young son and told me the story of his pregnancy and birth.

It was an amazing story, but Faiza's last words surprised me even more.

I said, "I'm a virgin."

"I have two medical certificates to prove it."

This is the story of the modern Middle East, where 2,000 years after Christ's birth, the virgin birth is still talked about as a reality of life.

Faiza's story is one of many I've heard about sex in my travels in the Arab world over the years.

This may sound like a dream job or a very shady job, but to me it's neither.

I'm half Egyptian and half Muslim

I was born and raised in Canada, far from my Arab roots.

Like many people from both the East and the West, I've long wanted to better understand my roots.

I chose to look at sex because of my involvement as a writer, researcher and activist on HIV and AIDS.

Sex is the driving force behind the HIV and AIDS epidemics in the Middle East and North Africa, one of only two regions in the world where infections are still rising.

Sexuality is now a very important perspective in the study of any society, because our nocturnal activities are a force on a larger scale, reflected in politics and economics, religion and tradition, gender and generation.

If you really want to know the people of a country, you have to start by looking at their bedrooms.

Of course, the Arab world is vast and diverse.

But there are three lines that cannot be crossed, neither in words nor in actions.

The first is politics.

But the Arab Spring overthrew the regime, and since 2011, civil war has erupted across the region.

Today, new and old forces alike are trying to maintain their rule as usual, while millions of people are fighting for a better life.

And the second is religion.

With the rise of organizations like the Muslim Brotherhood, religion and politics are now intertwined.

Some are beginning to question the role of Islam in public and private life.

And the third is that topic that shouldn't be touched. What do you think it is?

Audience: Sex

Elfeki: I can't hear you, so speak loudly.

Audience: Sex

Elfeki: One more time, please don't be shy.

Audience: Sex

El-Feki: Yes, that's right, sex. (Laughter) In the Arab world, the only condition for sex is marriage.

Marriage is the only way to grow up

You can't leave your parents' house without getting married, you can't have sex, and you can't have children.

Marriage is a social refuge and an impregnable fortress that not only withstands any attack, but has no alternative.

And around that are all sorts of taboos, like no premarital sex, no condom use, no abortion, no homosexuality.

Faiza was a living witness to this

Saying she's a virgin isn't just wishful thinking.

Even though the region's major religions extoll premarital chastity, in patriarchal societies, "boys are boys."

People generally turn a blind eye when men have sex before marriage.

This doesn't apply to women, who must be virgins on their wedding night -- that is, they come to the wedding night with an intact hymen.

This isn't a personal matter, it's a matter of family honor, especially men's honor.

Therefore, women and their relatives go to great lengths to protect the tiniest parts of their bodies, from female genital mutilation to virginity testing to hymenoplasty.

Faiza chose a different route: non-penetrative sex.

but she got pregnant

Faiza didn't actually know she was pregnant because there was little sex education in schools and little communication between families.

Her mother helped Faiza escape from her father and siblings when her pregnancy became unconcealed.

This is because honor killings are a real threat to countless women in the Arab world.

When Faiza was finally admitted to a hospital in Casablanca, the man who helped Faiza tried to rape her.

Unfortunately, there are many women like Faiza.

In Egypt, the center of my research, I saw a lot of problems around marriage and divorce.

There are so many men who can't afford to get married because marriage has become so expensive.

Men are expected to bear the financial burden of marriage, but there are no jobs.

This is one of the main factors in the recent upheaval, and one of the reasons why the age of marriage is rising in much of the Arab world.

There are career women who want to get married, but they can't find husbands because they're rebelling against gender roles, says a young Tunisian female doctor, who says, "Women are becoming more and more open.

Men are still living in prehistoric times," he told me.

And there are men and women who cross the boundaries of heterosexuality, who have sex with people of the same gender, or who have different sexual identities.

They are subject to laws that punish not only what they do, but even what they look like.

They struggle daily with social stigma, broken families, and religious hell torture.

And it doesn't seem all is rosy when it comes to marital life.

Married couples who want greater happiness in their marriages—and more fulfilling sex lives—are at a loss as to how they can achieve it, especially wives, because they're afraid they'll look like bad women if they shine in the bedroom.

And then there's prostitution that takes place under the guise of marriage.

They are often sold by their families to wealthy Arab travelers.

This is just one facet of the growing sex industry in the Arab world.

Now, if you remember hearing this story in your home country, please raise your hand.

Yes, it seems that the Arab world does not have a monopoly on sexual concerns.

We still don't have an Arab version of the Kinsey Report that tells us exactly what's going on in bedrooms in the Arab world, but it's almost certain that something is wrong.

Unfair standards for men and women, sex being stigmatized, families narrowing personal choices, there's a big gulf between appearance and reality, between what people do and what they admit they're doing, and they're generally unwilling to move from private whispers to serious, consistent public debate.

A doctor in Cairo said, "Sex is the opposite of sport here.

Everybody talks about soccer, but almost nobody does it

Sex is something everyone does, but no one wants to talk about it."

When your husband reaches for you and grabs your body, exhale slowly and look at him sexy.

When he penetrates you with his penis, talk to him invitingly and move with him.

Exciting!

You might think that these helpful tips can be found in "Sexual Pleasure" or Youporn.

It's actually in a 10th-century Arabic book called The Encyclopedia of Pleasure, which covers everything from aphrodisiacs to zoophilia about sex.

This is just one example of a long tradition of erotic literature in the Arabic-speaking world, much of it written by religious scholars.

As far back as the Prophet Muhammad, Muslim cultures have a rich tradition of speaking frankly about sex, not only about problems, but also about pleasures, from the perspective of women as well as men.

Thousands of years ago, there was an encyclopedia of sex written in Arabic.

It had a vocabulary rich enough to cover all aspects of sex, positions and preferences, and to shape the female body as you can see.

Today, this is largely unknown in the Arabic-speaking world.

Unknown to educated people, they feel more comfortable talking about sex in a foreign language than in their native language.

The sexual situation is a lot like Europe and America right before the sexual revolution.

But while the West has liberated itself about sex, Arab societies seem to be heading in the opposite direction.

The closedness of sex in Egypt and its neighbors comes from the closedness of politics, society and culture.

It's also the product of a complex historical process that has been widespread since the late 1970s with the rise of Islamic conservatism.

"Never accept" is the position of conservatives around the world when the state of sex is challenged.

In the Arab world, these protests are branded as a Western conspiracy, undermining traditional Arab-Muslim values.

But the real problem is that conservatives have one of the strongest controls: cloaking sex with religion.

But if you look back in history, most recently, even in the days of our fathers and grandfathers, there was a time when they were pragmatic and tolerant, and open to other interpretations, including abortion, masturbation, and the sensational topic of homosexuality.

It's not black and white, as conservatives would have you believe.

On these topics — like anything else — there are at least 50 shades of gray in Islam.

(Laughter) Through my travels, I've met men and women across the Arab world who are seeking out different voices: sexologists trying to help couples have better marriages; pioneers working to bring sex education into schools; lesbians, gays, transgender and transgender men and women;

Women, and increasingly men, are speaking up and fighting against sexual violence in the streets and at home.

There are groups that help sex workers protect themselves from HIV and other occupational hazards, and NGOs that help single mothers like Faiza find their place in society and, most importantly, stay with their children.

Right now, these efforts are still small, underfunded, and subject to unmanageable headwinds.

But I'm optimistic that in the long run, times are changing and their ideas will take hold.

Social change in the Arab world doesn't happen by defeating or exposing through dramatic confrontation, but by dialogue.

The point here is not sexual revolution, but sexual evolution. Learning from the rest of the world, adapting to local conditions, and making your own path rather than following someone else's path.

It is my hope that this path will one day lead us to the right to control our bodies, to access the information and services we need, and to have a satisfying and safe sex life.

The right to express your thoughts freely, to marry who you choose, to choose your partner, to choose how often you have sex, to choose whether and when to have children - all of this must be achieved without violence, coercion or discrimination.

The Arab world is still far from this ideal, and many things need change, in the law, in education, in the media, in the economy.

But it begins with a journey I've taken myself, by severely questioning the conventions of our sex life.

And this trip has strengthened my beliefs and my understanding of the local history and culture.

Given the turmoil that's going on in many Arab countries right now, talking about sex, challenging taboos, and finding alternatives sounds like a luxury.

But at this pivotal moment in history, if we don't value freedom and justice -- dignity and equality, privacy and autonomy -- in our private and sexual lives, it will be harder to achieve them in public as well.

They say politics and sex go hand in hand, and it's true for all of us.

It's true no matter where you are in the world or who you love

thank you

(applause)

I guess this is also thanks to globalization Coca-Cola cans on the summit of Mount Everest Monks in Monterey

(Laughter) I came from the Himalayas at your invitation just two days ago.

So I would like to invite you all to the Himalayas for a while.

And let me show you where there are novices like me.

This is a video I took when I was lucky enough to be there

Mount Kailash in Eastern Tibet -- Amazing View

It's like the Marlborough wilderness

(Laughter) This is a turquoise lake.

meditator

This is Eastern Tibet on August 1st, the hottest day of the year.

The night before, we had all camped, and my friend in Tibet said, "We sleep outside."

"Yes, but it's summer," I said.

(Laughter) Now let's talk about happiness.

I'm French, and there are many intellectuals in France who have no interest in happiness.

(Laughter) I just wrote an essay on happiness, and controversy arose.

Someone wrote, "Please don't impose such dull things as happiness.

(Laughter) Happiness doesn't matter. Live passionately.

I like the ups and downs of life

Suffering is good, because it feels good when you take a break."

(Laughter) This is the view from my balcony in the Himalayas.

It's a small three-by-two-meter room, and you're always welcome.

(Laughter) Now let's talk about happiness or contentment.

First of all, no matter what the French intellectuals say, no one wakes up in the morning thinking, "Am I going to suffer all day today?"

(Laughter) I mean -- whether consciously or not, directly or indirectly, in the immediate future or in the future, everything we do, what we hope, what we dream, all of these things are connected, deep down, to our quest for happiness.

Pascal said that those who hang themselves have searched for a way to end their suffering and found no other way.

But if you look in Eastern and Western literature, you'll find a surprising variety of definitions of happiness.

Some people say, "Trust the memory of the past, imagine the future, and forget the present."

Some people say, "Happiness is the present moment, the degree of freshness of the present moment."

And this led the French philosopher Henri Bergson to say, "All the great thinkers of the humanities left happiness vague so that they could define it in their own terms."

It doesn't matter if you're not so concerned with happiness in your life.

But if happiness is to define the quality of every moment in our lives, we'd better know what it is and have a clear idea of ​​what it is.

And perhaps it's because we don't know much about happiness that we often turn our backs on it when we seek it.

I want to escape from the pain, but I feel like I'm running towards it

It may be due to some kind of misunderstanding

We often mistake joy for happiness

If you look closely at these two characteristics, pleasure depends on time, purpose and place.

its nature can change

The first slice of chocolate cake is delicious, the second slice is not so good, and the third slice is disgusting.

(Laughter) That's the nature of things.

I used to love Bach and played it on my guitar.

I never get tired of listening to it 5 times

If you listen to it 24 hours a day without a break, you might get bored.

It feels good to be near the fire when it's cold

And after a while, it moves back a little bit, and then it feels really hot.

Joy seems to be consumed with experience

and it doesn't come from you

The intense joy you feel can cause a great deal of suffering to those around you.

So what is happiness?

Happiness is such a vague term, let's call it contentment.

From the Buddhist point of view, the best definition is that contentment is not just a feeling of pleasure.

It is something that quietly fills the depths of the heart

It permeates and underlies all the workings of the mind, the joys and sorrows of life.

you might be surprised

In a sense, it is possible to be content even in the midst of sorrow

because we are talking on another level

Look at the waves crashing on the shore

If you are in the valley of the waves, you will hit the seabed

hitting hard rock

I'm in high spirits when I'm on the waves

The sea surface moves up and down

Look at the open ocean, there may be a mirror-like beautiful and calm sea

It may be a stormy sea, but the depth of the sea is there and it doesn't change.

What do you mean?

It's not a fleeting feeling or sensation, it's a state of being.

Joy can also be a source of happiness

There are also evil pleasures, such as taking pleasure in someone's suffering

So how do we find happiness? usually try to find it from the outside world

In order to be 'happy', we think that we can be happy if we meet all the conditions in all situations.

Destruction awaits the happiness of this way of thinking

To have everything If something is missing it will crumble

When something goes wrong, we always try to fix the world around us, but the power we exert on the outside world may be limited, temporary, illusory.

Now look at the internals, aren't they stronger?

Isn't it the mind that captures happiness and suffering from the outside world?

Isn't the influence of the heart strong?

You know that living in a little piece of paradise can be downright unhappy.

When the Dalai Lama went to Portugal, there was construction going on everywhere.

One night he said, "Isn't it better to build something in your heart than to build a fine building?"

And he said, "If you live on the 100th floor of a nice, modern, cozy, high-tech apartment, and you're really unhappy inside, you're going to find a window to jump out of."

On the flip side, there are many people who remain calm, strong, free and trustworthy even in the most difficult circumstances.

So if the internal conditions are strong, of course, the external circumstances will play a role.

But this alone is not enough; it is only an auxiliary condition.

It is the experience that resides in the mind that interprets everything.

If you ask yourself how to develop the conditions for inner happiness, you may find things inside yourself that hinder happiness.

It takes some experience to figure this out

You have to be aware that there is a certain state of mind, a state of mind that leads to this state of happiness, this state of contentment, what the Greeks called eudaimonia.

There are things that get in the way of this state of contentment.

Even if you look in your own experience, you'll find anger, hatred, jealousy, arrogance, cravings, obsessions -- you're not in a very good state after being caught up in these emotions.

Moreover, they are detrimental to the well-being of others.

The more these things invade my mind, the more miserable and distressed I feel, like a chain reaction.

On the flip side, we all know that at the heart of acts of dedication and generosity, even from a distance, and without anyone else knowing, you can save a child's life and make someone else happy.

we don't need to be recognized or appreciated

Just doing that gives me deep satisfaction.

It is the "appearance" that I always want to be

So is it possible to transform the state of mind by changing the way we live?

Negative or destructive emotions that your mind was born with?

Is it possible to change our moods, traits and emotions?

For that we must ask: What is the nature of the mind?

From an empirical point of view, the main quality of consciousness is simply the recognition and awareness of facts.

Consciousness is like a mirror that reflects all images

ugly face and beautiful face

Mirrors don't care Mirrors don't get dirty, they don't get corrupted by images

Similarly, behind every thought is raw consciousness, pure awareness.

That's the nature of it. Consciousness cannot be tainted by hatred or jealousy.

Consciousness is always there, just like cloth is cloth even if the whole is dyed with dye.

We are not always angry or jealous or generous.

The fabric of consciousness differs from stone in its purely perceptive nature, and so it has the potential for change, because all emotions pass away.

That's the foundation of training the mind.

Mind training is based on the idea that two opposing mental factors cannot occur at the same time.

you can go from love to hate

But at the same time, at the same time, for the same thing, for the same person, you can't wish for good while wishing for harm.

you can't hit while shaking hands

It means that there is a natural antidote to the emotions that keep us from feeling full inside.

There's a way to go

Inner freedom against greedy attachment

Compassionate kindness to hatred

Of course, each emotion requires a specific antidote.

Another way is to analyze the attributes of all emotions and try to find countermeasures.

Normally, when we feel uncomfortable, hateful, upset, or obsessed with someone, our minds revisit that object.

Every time you think about that object, your attachment and discomfort increase.

The process repeats endlessly

What we should look at now is to look inward instead of looking out.

watch the anger itself

It looks very scary like a boiling monsoon or a thundercloud

It looks like you could even sit on that cloud, but when you get closer, it's just fog.

Similarly, when you face the emotion of anger, it disappears like frost in the morning sun.

As you face and resolve your anger over and over again, the repetition of anger gets smaller and smaller each time you resolve it.

And eventually, even when anger arises, it only scans the mind and leaves no trace, like a bird in flight.

This is the basis of training the mind.

It takes time -- just as it took time to build up the flaws and tendencies of the mind, it takes time to untangle them.

but it's the only way

Transformation of mind is what meditation means

Mastering new ways of being and perceiving things that are more real, that are mutually supportive, that are continuous like a flow, that is who we are and what we are conscious of.

Now, I need to tell you this story about the connection to cognitive science, and I have to talk about it in a short, limited time, about brain plasticity, where we used to think that brain function was immutable.

Until about 20 years ago, it was thought that the total number of all neural connections would change very little after adulthood.

We now know that it can change a lot.

I've heard of violinists who have undergone 10,000 hours of violin training, and the part of their brain that controls finger movements undergoes profound changes that strengthen synaptic connections.

In human dignity loving mercy

Patience Can an open mind do the same?

this is what those great meditators do

Some masters who have come to our labs in Madison, Wisconsin, or Berkeley, have meditated for 20,000 to 40,000 hours.

They lived in seclusion for about three years

Meditate 12 hours a day during that time, then 3-4 hours a day thereafter.

They are true Olympic winners in mind training.

(Laughter) One of the masters of meditation -- great.

There are 256 electrodes here. (Laughter)

What did you find out? It's the same story as before.

I can't talk about the research yet, but hopefully it will be published in Nature eventually.

This study looked at unconditional compassion

I enlisted the help of a meditator who, over the years and years, had learned to allow compassion to flow in his heart.

In the course of the training leading up to that point,

We think of those who are suffering, we think of those we love, but eventually compassion can overwhelm all.

Here are the initial results, which have already been published so I can talk to you.

The bell-shaped curve shows the 150 comparisons, here measuring the difference between the left and right frontal lobes.

In short, people who are more active on the right side of the prefrontal cortex are less energetic, more withdrawn, and less positive emotions.

Conversely, the left side tends to be: altruistic, happy, expressive, curious, etc.

this is the basic trend

If I see a funny movie, I lean to the left.

If you're satisfied, move more to the left.

If I have a depressive attack, I go to the right.

A value of -0.45 for meditators who meditated on compassion was four standard deviations.

completely deviated from the normal distribution

I don't have time to state all the scientific results

Let's hope we have another chance

Coming out of the MRI for the first time in three and a half hours, it was like coming out of a spaceship.

Other labs, such as Paul Ekman's lab at Berkeley, have confirmed something similar, and some meditators can control their emotional responses more than previously thought.

For example, we conducted an experiment that surprised

You put someone in a chair and they attach all sorts of instruments that measure their physiology, and then they detonate something like a bomb.

Some meditators, without trying to be startled, by being completely open-minded, see the explosion as a small event, like a shooting star, and are completely unperturbed.

The bottom line is that this experiment isn't like a circus, trying to show someone who can do something special.

I want to say that mental exercise is important, it's not just a luxury.

Nor is it a mental vitamin supplement

This is what determines the quality of every moment in our life

Ladies and gentlemen, willingly spend 15 years teaching

jogging and fitness

I will do anything to maintain my good looks

But we're surprisingly indifferent and unsatisfied with the most important thing, the way our mind works, which is fundamental to the quality of our experience.

Our mercy should be put into action

we're trying to do it everywhere

This one example alone is worth the effort.

This woman with tuberculosis was left to die in a tent with her only daughter.

she's a year later

The schools and hospitals we open in Tibet

I would like to leave behind a beautiful expression that speaks of happiness more than my words.

and a Tibetan jumping monk

(laughs) Flying monk

Thank you very much

One of my best childhood memories was with my grandmother, Mamar, in Brooklyn, New York, where four generations lived.

Grandma's room was an oasis

So I sneaked a cup of coffee, but it was nothing more than warm milk with a little caffeine.

Grandmother really enjoyed life

Although I worked in a factory, I saved money and traveled to Europe.

I looked at countless pictures with my grandmother and danced to her favorite music.

When I was eight years old and my grandmother was 60, the change came.

My grandmother quit her job and stopped traveling.

I stopped dancing

no more coffee time

My mother took a break from work and took my grandmother to the doctor.

My father, who worked the night shift, spent the afternoon taking care of my grandmother, taking care of her food.

My family was exhausted from caring for my grandmother

By the time the diagnosis came out, I was already in the quagmire.

Now, some of you may have already noticed my grandmother's symptoms.

my grandmother had depression

It was a severe, life-changing depression that I never managed to overcome until the very end.

At the time, we knew very little about depression.

Even today, 50 years later, there are still many things we don't understand.

It turns out that women are 70 percent more likely to develop depression during their lifetime than men.

Even with this high incidence rate, we're still misdiagnosing 30 to 50 percent of women diagnosed.

Compared to men, women are more likely to suffer from fatigue, trouble sleeping, pain and anxiety.

These are often overlooked symptoms of depression.

These gender differences aren't unique to depression, they occur in many diseases.

Seeing my grandmother's suffering set me on a lifelong quest.

Today, as the leader of a facility whose mission is to advance women's health, I'm trying to understand what causes gender differences, and I'm using what I've learned to help improve women's health.

Today, according to the Institute of Medicine, "Every cell has a sex"

We know that every cell has a sex

That means that men and women are different at the cellular and molecular level.

We have brains, hearts, lungs, joints, etc.

it's different in every organ

Until just 20 years ago, we had very little data on women's health other than reproductive function.

But in 1993, the NIH Activation Act became law.

This law required that clinical research funded by the National Institutes of Health include women and minorities.

This law has positive effects in many ways.

Now that women are routinely included in clinical research, we know that disease affects men and women very differently.

But surprisingly, these differences are often overlooked.

So we have to ask ourselves, "Why leave women's health to chance?"

We're giving up control in two ways.

The first is that we still have a lot more to learn in order to fully understand gender differences, and we haven't invested enough in it.

The second thing is that what we've discovered so far isn't being applied in today's day-to-day medical practice.

we still have work to do

Here are three examples of areas where gender differences affect women's health today, and where we need to focus more.

Heart disease first

Heart disease is the leading cause of death for women in America.

This is what heart disease is all about

Linda is a middle-aged woman who once had a stent in one of the arteries that lead to her heart.

I went to see my doctor because my symptoms recurred.

The attending physician performed the most appropriate cardiac catheterization.

No thrombus was found.

Linda's symptoms never stop

she had to quit her job

This time she found us

When Linda first came in, we did another cardiac catheterization, and we found a clue.

I just had to do another test to make a diagnosis.

It's a technique that uses ultrasound, called intracoronary echo, to look at arteries from the inside.

And we've identified that Linda's disease is different from that commonly seen in men.

The disease seen in male patients looks like this.

Blood clots and stenoses can be seen here and there

Linda's disease, on the other hand, looks like this, as it does in many women.

Compared to men, plaque is spread more evenly along arteries and is harder to spot than it is in men.

So the criteria that were supposed to be best for women, Linda included, weren't the right ones.

Linda got proper treatment

Luckily, I'm doing well now.

But Linda was just lucky

she found us and was able to identify her illness

But unfortunately there are not many women like that.

We have tools to diagnose

there is technology

But these gender differences are often overlooked.

What about treatment?

A groundbreaking study published two years ago asked a very important question: What is the most effective treatment for heart disease in women?

In a decade-long survey of research papers, we rejected hundreds of papers.

A whopping 65 percent of the rejected papers were rejected because they included women in the study, but they didn't separate the results of their analysis into males and females.

what a waste

I spent money, but I didn't get to know about women.

These studies did nothing to help answer the all-important question, "What are the most effective treatments for heart disease in women?"

Let me introduce you to my godmother, Hortense, my colleague's cousin, Hyunway, and, as you may know, Christopher Reeve's wife, Dana.

These three people have one very important thing in common.

All three were diagnosed with lung cancer, the leading cause of cancer death for women in America.

All three were nonsmokers.

Sadly, Dana and Hyunway passed away from the disease.

Women who never smoke are three times more likely to be diagnosed with lung cancer than men who never smoke.

But interestingly, women diagnosed with lung cancer have a higher survival rate than men.

I have the key to solve the mystery

Our researchers realized that both male and female lung tumor cells have specific genes.

These genes are activated primarily by estrogen

Increased survival was seen only in young women when these genes were overexpressed

This is an early research finding, and we don't yet know if it translates into clinical practice.

But discoveries like this give people hope, and they may even save lives, men and women alike.

Now I'd like to share with you an example of how thinking about gender differences can move science forward.

A few years ago, a new drug for lung cancer came under investigation, and when the author looked at shrinking tumors, 82 percent were women.

So they thought, "Why?"

And it turns out that the genetic mutations that the drugs were targeting are overwhelmingly more common in women.

This discovery allows for a more individualized approach to lung cancer treatment, including gender differences.

This is what happened when women's health wasn't left to chance.

We know that when you invest in research, the results will follow.

Let's take a look at changes in breast cancer mortality rates

And let's also look at the variation in mortality from lung cancer in women.

Now let's look at the investment in breast cancer. This graph shows the investment per patient that dies. This is the investment in lung cancer.

I'd say the investment in breast cancer research paid off.

It may be slow, but it's definitely happening

We can do the same for any other disease, including lung cancer.

back to depression

Depression is the number one cause of disability in women worldwide.

Our research shows that there are differences between men and women in parts of the brain associated with emotions.

We put a man and a woman through a device called a functional MRI that looks at what happens when the brain is activated, and they put them under stress.

you can really see the difference

We believe that findings like this will give us clues as to why there is such a large gender disparity in depression.

Despite knowing that these differences exist, 66 percent of animal brain studies are conducted on males or on unspecified animals.

So I have to go back to that question again, "Why leave women's health up to chance?"

This question has been stuck in the back of our minds, both scientific and medical, because we believe it holds the key to significantly improving women's health.

We know that each cell has a sex.

I know these differences are often overlooked.

So we know women are underrepresented by modern science and modern medicine.

We have the tools, but we still lack the collective will and momentum.

Women's health is an issue of equal rights between men and women, and it's as important as equal pay for men and women.

And it's also a matter of the quality of science and medicine, and even the health of those things.

(Applause) If these gender differences were taken into account when we started our research, or if we had analyzed the data with gender differences in mind, how could we improve women's health?

Please try to imagine

People often ask me, "What can I do?"

My answer is, first, think of women's health as important as any other issue you care about.

And the second is just as important. As a woman, ask your doctor and your loved one's doctor, "Is this disease and its treatment different for men and women?"

This is a very important question, and most of us would answer yes, but your doctor may not know the answer yet.

If so, it's highly likely that this question will prompt the doctor to try to find the answer.

This is so important, not just for ourselves, but for those we love.

It means a lot to mothers, daughters, sisters, friends and grandmothers.

It was my grandmother's suffering that drove me to work promoting women's health.

This is the legacy she left me

Improving not only the health of women in this generation, but also the health of women in the next generation, is our legacy for the future.

thank you

(applause)

Over the years, I've been trying to figure out two mysteries: Why are we so unproductive? And every company I work for—

Happens at over 500 companies

Despite all this technological progress - computers, IT, communications, telecommunications and the Internet.

The second mystery is why work is not rewarding?

Why do all the employees feel miserable and even dare not get involved?

keep your distance from your co-workers

It's as if it's against the interests of the company.

In spite of all these social events, celebrations, voluntary activities, and leadership development programs for managers who learn how to revitalize their teams.

At first, I thought this was a chicken-and-egg problem.

Or is it the other way around, because your productivity is low and you feel pressured and unmotivated?

But as I proceeded with my analysis, I realized that these two problems have a common root cause, and that factor is also fundamental to how you run your business.

A company consists of two pillars.

“Hard” – Organizations, Processes, Institutions

“Soft” – Feelings, Moods, Relationships, Personality “Soft” – Feelings, Moods, Relationships, Personality

So whenever a company restructures, transforms, and implements a culture change program, it targets these two pillars.

We try to refine and combine them.

The real problem, which also answers two mysteries, is that these pillars are obsolete.

Everything you read in a business book is based on one pillar or both.

I'm behind the times

What if we applied these approaches to today's complex enterprise?

The "hard" approach usually starts with strategic requirements, organizational structures, processes, institutions, KPIs, performance charts, committees, headquarters, hubs, clusters, etc.

There are metrics, incentives, committees, coordinating bodies, and interfaces.

What's going on here on the left side is adding new complexity to the business.

Quality, cost, reliability and speed are also necessary

We use the same approach as these new requirements are added.

Create organizations and institutions dedicated to doing just that, to deal with that new complexity.

A hard approach just complicates the organization.

Let me give you an example

Let's say the engineering department of an automaker is a five-dimensional matrix organization.

If you open up one square in that matrix, you'll find another 20-dimensional matrix.

We have people in charge of noise, fuel efficiency, and anti-collision materials.

Every time a new requirement is added, we create a dedicated function for it and have it tasked with coordinating that new requirement with the engineers.

What happens when new requirements emerge?

A few years ago, a new requirement came up in the market: extended warranties.

This new requirement called for something called "repairability," which is to make it easier to repair.

If you send your car in for repairs because of a light problem, and if you don't remove the engine and you can't touch the lights, the car repair takes two hours, but it takes a week, and your budget quickly swells.

What was the solution to the hardware approach?

It was to create a new function for the new requirement of resilience, which meant having a resilience person.

The person in charge of restorability creates a process to ensure restorability

It creates reparability metrics and metrics, and even defines incentives to promote reparability.

Reparability outperforms 25 other KPIs and rises to the top

How much would a variable compensation system affect me?

Up to 20%, divided by 26 KPIs, equals 0.8% for reparability.

How would that change your behavior? Which option to simplify? nothing changes

But on no impact, put a resiliency lead, create a process, a performance scale, and coordinate with the other 25 indicators, no impact.

Faced with the complexity of the corporate environment, filling the org chart with boxes and delineating the chain of command solves nothing.

The solution lies in interaction

how to work together

It's how to connect, intersect, and synaptically connect.

It's not about the skeleton of the container, it's about how you can adapt and use your intelligence in dealing with nervous system problems.

You can also call this "cooperation".

If everyone works together, there will be fewer resources for everything.

The problem of reparability boils down to a question of cooperation.

What you have to think about when designing a car is the needs of your after-sales repair people.

Without cooperation, it takes more time, more equipment, more systems, more teams.

If sourcing, supply chain, and manufacturing don't work together, you'll need more inventory, more inventory, more operating capital.

Who will bear the burden?

Are you a shareholder? Are you a consumer?

there is no need to bear

So who's left are the employees, who have to make up for the lack of cooperation with a very personal effort.

Stress, burnout, pressure, accidents are bound to happen.

I understand that employees don't want to get involved.

What can be done, both hard and soft, to increase cooperation?

Let's start with the hardware side. For example, in a bank, there's a problem between the back office department and the customer service department, but they don't cooperate with each other.

Create a middle office (coordination department)

what will it be like in a year

One problem between back office and customer service departments is now two

Administrative management and middle office

There are also costs in the middle office.

A hard approach doesn't increase cooperation.

On hardware, you just build new containers, you just add bones to your skeleton.

How about a soft approach?

It makes you feel good about the other person, because if you like each other, it's easier to work together.

but this is totally wrong

even unproductive

We have two televisions. Why?

I don't have to cooperate with my wife straight out.

(Laughter) I try not to have to trade off with my wife.

The reason I try not to trade off is because I love my wife.

If you don't love your wife, one TV is enough. They say, "You're going to watch my favorite soccer game. If you don't like it, read a book or leave."

(Laughter) The more you like each other, the more likely you are to avoid true cooperation, where you're tying the relationship down with hard trade-offs.

If we don't have two TVs, it will escalate and go to arbitration.

Of course, these approaches are outdated.

To deal with complexity and expand our nervous system, we've developed a "smart simple approach" that uses simple rules.

The first rule is "understand your co-worker's work."

What are your colleagues doing?

Think outside the box and understand what's on the job description, not just what's on the surface, but what's really inside.

If you're a designer and you put a wire in here, you know you have to remove the engine to get to the lights.

The second rule is, "Strengthen the facilitator."

It's the managers, not the middle office, who are the facilitators. Empower the managers you have now, so that they can have stakes in their own right and co-operate with others.

How can managers be coordinators?

remove the layers in between

If there are too many hierarchies, it will be far from the field, so KPIs and metrics will be required, and delegation of authority will be weak against reality.

They don't understand reality, so they introduce metrics, KPIs, complex things.

It's about getting rid of the rules. The bigger the organization, the more facilitators you need, so the fewer the rules, the better.

But the reality is different.As organizations grow, they churning out rules

It has rules like the Britannica dictionary.

And we also need to "expand our power," to delegate power to everyone and leverage their judgment and intelligence.

We have to give everyone more cards, so that everyone can take risks, work together, and have the cards they need to get out of isolation.

Otherwise everyone will be withdrawn and unwilling to get involved.

These rules are based on game theory and organizational sociology.

It is also possible to "make a 'shadow of the future' feel"

It creates a feedback loop and makes employees feel the consequences of their actions.

The automaker I mentioned earlier also did this because they realized that reparability doesn't make sense.

I said to the designer, "Three years from now, when this new car hits the market, you're going to move into aftersales, and you're going to be responsible for the warranty budget, and if the warranty budget goes over, you'll be responsible."

We also need to "increase interdependence."

If you take these buffers away, you grab my nose and I grab your ears

I have no choice but to cooperate

get rid of the second tv

We have a lot of second TVs in the office that don't create value, they just create dysfunctional self-sufficiency.

The next thing we need is this: "Reward those who cooperate, and hold those who don't cooperate accountable."

Lego's CEO, Joan Vie Knudstorp, is using it to his advantage.

He said it wasn't the failure that was to blame, but the failure to cooperate or not be asked to cooperate.

this will change everything

Exposing your own weaknesses and prospects is to your advantage, because you are not blamed for failure, but blamed for failing to cooperate and not being asked to cooperate.

By doing this, you can get a lot of suggestions about what kind of organizational design to do.

Stop drawing boxes and dotted lines and solid lines on your org chart and start looking at interactions.

Fiscal policy will also need to be reviewed.

The same is true in human resource management.

By doing this, we can manage complexity, manage new complexity in our business, while avoiding further complexity.

Create more value at lower cost

At the same time, job performance and job satisfaction increase because we've removed a common source of complexity for both.

Business leaders, complexity is your battle.

The real battle is not against your competitors.

That's a silly abstract thing.

When do you meet your competitors to compete?

The real battle is within ourselves, fighting bureaucracy and complexity.

and only you can do this

thank you

(applause)

i have anxiety

I've been afraid to stand on stage for a long time.

But it didn't even matter until I was 27.

Around this time, I started writing songs, but I just sang them myself.

Just having my roommate under the same roof made me nervous.

A few years later, writing songs was no longer enough.

I had so many stories and ideas that I wanted to share with everyone, but it just wasn't physically possible.

I was scared for some reason

But as I wrote and practiced, I wanted to perform in public.

So it's the week of my 30th birthday, and I'm trying to forget my fears when I decide to sing on a walk-in stage at my hometown.

When I went there, the venue was packed.

there were 20 people

(Laughter) Everyone looked angry.

But when I took a deep breath and signed up, I felt pretty good.

The only time I felt good was until 10 minutes before the show, when my whole body reacted and a wave of anxiety came over me.

Now, when you're afraid, your sympathetic nervous system is stimulated.

And you get a rush of adrenaline, you get heart palpitations, you breathe faster.

Then unrelated systems shut down, like the digestive system.

Your pupils dilate, your muscles contract, your spider sense tingles, your entire body becomes trigger-happy.

(Laughter) The nervous system is really stupid.

Crazy, right? After 200,000 years of human evolution, you can't tell the difference between a sabre-toothed tiger and 20 folk singers on stage on a Tuesday night.

(Laughter) There's nothing more terrifying than that time -- except for this moment.

(Laughter) (Applause) Now it's my turn. I manage to get on stage and start playing. When I open my mouth to sing the first lyric, I get absolutely the worst vibrato.

And it doesn't have the nice vibrato of an opera singer, but it's like your whole body is trembling with fear.

it was just a nightmare

It was embarrassing, and the customer was obviously embarrassed, and was only paying attention to my discomfort.

it was really bad

This was my first experience as a solo singer-songwriter.

But there were good things too.

But I wanted more connection, and that required overcoming my phobia.

That night, I promised myself that I would go on stage every week until I overcame my stage fright.

I did it. I was on stage every week. Sure enough, week after week, it didn't get better at all.

It was then that an idea came to me

(Laughter) The idea was to turn my phobia into a song.

It seemed like the only truth when I was on stage, and the more nervous I was, the better the song would be.It's easy.

So I started writing a song about stage fright.

First, I sang about how I feel, what the audience thinks. I sing about how I feel, what the audience thinks.

And I knew I would sing my trembling voice half an octave higher, because I was nervous anyway.

It's a song that goes something like this, and what happened to me while I was singing it was that I got the audience to think about anxiety.

You don't have to feel sorry for me, because I'm nervous, in fact, and it made the whole room feel happy, nervous, and awkward.

Stage fright songs let you overcome big problems right from the start.

And then you can move forward, and it's a little bit easier, and you can finish the song all the way through.

And gradually, I didn't have to sing stage fright songs at all.

Except when I'm really nervous, like right now. (Laughter) Can I play a stage fright song?

(Applause) Can I have some water?

(music) Thank you

♫ ♫ I'm not kidding ♫ ♫ I'm really frightened ♫ ♫ If I'm shaking and singing ♫ ♫ Please take a look ♫ ♫ The blunder I'm showing ♫ ♫ My whole body shakes and my voice goes tremolo ♫ ♫ You look at me and look embarrassed ♫ ♫ Don't be shy Imagine them all undressed ♫ ♫ Singing in front of strangers naked is scarier than anything ♫ ♫ I don't need a long explanation ♫ ♫ I'm not a figure to brag about ♫ ♫ So get everyone dressed ♫ ♫ Oh, they weren't even naked ♫ ♫ And I'm the one with the problem But ♫ ♫ I can't help but ♫ ♫ I appreciate your advice, but it's too late ♫ ♫ Kind of domineering ♫ ♫ That sarcastic tone won't help me when I sing ♫ ♫ But let's stop talking like this ♫ ♫ 'Cause I'm on the stage and you're in the audience Hi ♫ ♫ Just because I'm scared doesn't mean I'm making fun of it ♫ ♫ 'Cause if I can't face it ♫ ♫ I didn't make it on stage ♫ ♫ Let me tell you one last time ♫ ♫ I'm slowly but surely recovering from my hangover ♫ ♫ Maybe next week I'll be playing my guitar ♫ ♫ My voice is as clear as water and everyone will start singing ♫ ♫ Then I'll get up and start dancing ♫ ♫ My voice ♫ ♫ I'll start dancing a little faster than the music ♫ (beats) hand)

I would like to reconsider education

Last year there was a new invention of four letters.

starts with M

MOOC is a huge open online course

Many organizations are offering these online courses for free to millions of students around the world.

If you have an internet connection and are willing to learn, you can take this amazing course from a great university, and even earn a certificate upon completion.

Well, in today's talk, I'm going to look at MOOCs from a different angle I'm going to look at MOOCs from a different angle

We're taking the technologies we learn and develop on a large scale, and the technologies we learn and develop on a large scale, and applying them to a small scale, creating a mixed model of education that really reinvents and reimagines what we do in the classroom.

Our classrooms were able to take advantage of that transformation.

So, this is the classroom, three-letter university in the northeastern United States, MIT, three-letter university in the northeastern United States, MIT.

Yes this is the classroom 50 or 60 years ago and this is the classroom now

What's the difference?

The color of the seat is color

Oops, that doesn't matter

Education hasn't changed at all in the last 500 years Education hasn't changed at all in the last 500 years

The last major innovation in education was the printing press and textbooks.

other things around me have changed

Yes, everything from health care to transportation has changed, but education hasn't changed.

Distance has always been a real issue, too.

Look at this, it's not a rock concert

The person you see in the far corner of the stage is not Madonna.

A classroom at Obafemi Aoro'o University in Nigeria A classroom at Obafemi A' Ororo University in Nigeria

Now, I'm sure you've heard of distance learning, but the student in the back row must be about 200 feet away from the teacher for distance learning.

Now, I really believe that education in all quality and scale and distance, education in all quality and scale and distance, can be transformed using technology.

For example, edX is transforming education with online technology.

To say that education has remained fixed for 500 years is that we are not really thinking about restructuring and controlling the details of education.

We really need to completely rethink education

It's just like an oxcart becoming an airplane.

We need to change the basic mechanics

everything must change

We need to move away from lectures in front of blackboards to online exercises and online videos.

Interactive fictional labs should transition to gamified learning Interactive fictional labs should transition to gamified learning

We should move to full online assessment and student interaction and discussion on the forum. We should move to full online assessment and student interaction and discussion on the forum.

really change everything

So edX and many other organizations have applied this technology to education through MOOCs to make education more accessible.

You know this case where we launched our first course here in the Hard Electronics and Electronics course at MIT. About a year and a half ago, 155,000 students from 162 countries enrolled in this course.

I didn't have the budget for advertising.

155,000 is a huge number

That's more than the total number of MIT graduates in the last 150 years -- more than the total number of MIT graduates in the last 150 years.

There were 7,200 students who received certification of completion, and it was a tough lecture.

7,200 people is an amazing number.

If you were to teach two classes at MIT each year, it would take you 40 years to teach this many students.It would take you 40 years to teach this many students.

Now, this big number is kind of a prelude.

So today, I'd like to discuss a different aspect of MOOCs, another aspect of MOOCs, a different perspective.

We're taking what we've developed and learned on a large scale and applying it to the small scale of the classroom, creating a hybrid model of learning.

But before that, let me ask you a question.

When my daughter turned 13 and became a teenager, she stopped speaking English and started speaking this new language.

i call it teenish

is a digital language

It's made up of two sounds, mumbling and silence

"Hey, it's rice."

"Hmm"

"I can hear it?"

Silence (laughs) "Are you listening?"

"Hmm." I had a huge communication problem, and it wasn't until one goddamn day that I couldn't get through to you until one goddamn day.

I sent a text message (laughs) and got a reply right away.

no no no it must be something wrong

You must be misunderstanding that your friend sent it You must be misunderstanding that your friend sent it

So when I sent it again, there was another reply with a bang.

i thought this was amazing

Since then, our relationship has changed.

email her and get a reply

All in all it's really amazing

(Applause) Yes, the 2000s are different. Yes, the 2000s are different.

I'm old, I look young, but I'm not part of the 2000s.

But children are really different

The 2000s are perfectly attuned to online technologies The 2000s are perfectly attuned to online technologies

Why are you arguing in the classroom?

Stop arguing and accept

In fact, my thumb is too big to text, but I'm sure that as it evolves, our children and their generation will be able to type very, very, very small thumbs and be good at texting, and as a result of evolution, everything will be fine.

But let's embrace technology, embrace the natural future trend of the 2000s, embrace the natural future trend of the 2000s.

there is a possibility

Rather than driving your child to class and having an 8:00 meeting -- I didn't want to go to school at 8:00 in the morning either, so why force it on your child?

What you should do instead is get them to watch videos and do interactive exercises in the comfort of their dorms, bedrooms, kitchens, bathrooms, wherever they feel most creative.

So come to class only for some kind of personal interaction.

they can argue with their peers

they can solve problems together

They can work with professors and get answers to their questions from professors.

In fact, when we were teaching the world in our first class on edX, a circuit and electricity course, this was happening in secret.

Two high school teachers from Santo High School in Mongolia, two high school teachers from Santo High School in Mongolia, they're changing the way they teach, and they're using our video lectures, they're doing interactive exercises, and these high school students -- you know, they're 15 years old -- they're doing this in their own homes, and they're coming into the classroom, and they're doing this kind of collaborative, physical experimentation.

And I found this out because they were blogging and I happened to stumble upon the blog.

I was doing some other test exercises.

Yes, it's an experimental lab fusion course at the University of San Jose in California, and also a lecture on circuits and electricity.

As many of you know, this lecture has become something of a learning culture test.

The students are there, but the teachers have changed the way they teach, and blended online and live lectures, and the results have been astonishing.

This result alone is still not reassuring

I should have spent a little more time on this experiment, but the results were unexpected.

Traditionally, every semester, every semester, for the past few years, this course was also a difficult course, with a failure rate of about 40 to 41 percent per semester.

Last year, in this blended class, the failure rate dropped to 9 percent.

Yes, the results are very, very good.

Now, before we move on, I'd like to talk to you about some key ideas. I want to talk to you about some key ideas.

What's the key idea and what makes this thing so good?

One is active learning

The idea is this: Instead of having students go to class and take lectures, we replace them with what we call lessons.

The lesson consists of both a video and an interactive exercise The lesson consists of a video and an interactive exercise

Students watch five or seven minute videos and review interactive exercises.

Think of it as the ultimate Socratic dialogue education.

you teach by asking

And this form of learning, called active learning, was recommended in a very early paper in 1972, where the authors Craig and Lockhart mentioned and discovered that learning and memory are deeply connected in deep mental processes.

Students learn better by interacting with the material Students learn better by interacting with the material

The second idea is to pace yourself

Now, if I go to the Great Lecture Room and you're like me, five minutes later you can't keep up with the professor.

I'm totally clumsy, I'm so busy writing notes that I can't think of lectures the rest of the time.

But with online technology, that's fine, and students are given videos and interactive assignments.

students can hit the pause button

You can rewind the professor's story,

No matter what you do, you can even turn off the professor's voice.

This self-paced method is very helpful for learning.

The third idea is instant feedback.

Computer grades exercises with instant feedback

Is there any other way to teach 150,000 students?

Computer grades all exercises

Well, in our time, you would turn in your assignments, and the grades would come back two weeks later, and you'd forget everything.

I don't think all my university assignments have been returned I don't think all my university assignments have been returned

some not rated

Yes, with instant feedback, students can submit their answers for testing.

If I'm wrong, I get immediate feedback.

You can try again and again and you can do really solid work.

They got instant feedback, and that little green checkmark right here is kind of a cult symbol for edX.

Learners say they dream of green checkmarks in bed at night.

In fact, one of the students who took the circuit course early last year actually took the Berkeley software course at the end of the year, and at the end of the year, he also took the Berkeley software course, and what he wrote on the bulletin board was about the green check mark at the start of the course about the green check mark at the start of the course. I don't remember

My colleague Ed Bartsinger, dean of the physics department at MIT, has this to say about immediate feedback. What he's trying to say is that immediate feedback turns teaching moments into learning outcomes.

The next big idea is gamified learning.

Oh yeah, all the students are really into the interactive learning videos and all that stuff.

If I'm going to take down an alien spaceship, I'll sit all day and do it until it's done.

So we can apply this gamified learning technique to learning and create an online lab.

How to teach creativity? How do you teach design?

In our online lab, we tackled these things, and we used the power of computers to create this online lab.

As you can see in this short video, it's not much different than having students design with Lego bricks.

Yes, you can build circuits here as easily as Lego. Yes, you can build circuits as easily as Lego here.

and at the same time can be evaluated by computer

Fifth, peer learning

So here we're using discussion forums, instead of using discussion and Facebook-like dialogue as a distraction, instead of using Facebook-like dialogue as a distraction, we're really helping students learn.

Let's talk

When I was teaching a circuit course to 155,000 students When I was teaching a circuit course to 155,000 students, I was leading the course for three days and nights.

I told my assistant student that I'm going to check the forums and answer the questions without a break I told him to check the forums and answer the questions

I once answered questions from 100 people.

But how do you handle 150,000 people?

I was sitting at 2:00 a.m. one night, and this question, I think it was from a Pakistani student, and he had a question, and I said, OK, I'm going to type the answer.

I gave a different answer

So I sat and watched

Boom boom boom boom The students continued to debate and talk to each other and until 4 o'clock that night, I was really watching.

My job was just to be there and watch and say, "Yes."

It's really amazing, and on the spot the students learn from each other, they say they learn by teaching, they say they learn by teaching.

This is not about the future at all

it's happening right now

So we're doing this blended learning experiment in a lot of universities and high schools around the world, from Tsinghua University in China, to the National University of Mongolia in Mongolia, to Berkeley in California.

And this kind of technology -- the convergence model is really useful, and it's the kind of thing that's really driving change in education.

At the same time, it's giving a real solution to the business problem of MOOCs.At the same time, it's giving a real solution to the business problem of MOOCs.

We will license this MOOC to other universities, we will license this MOOC to other universities, and we will incorporate the MOOC income model into the license, and the licensed university with the professor will be able to use this online lecture like a next-generation textbook.

They can use as much or as little as they like, and they become tools like the swords of the teachers.

One last look at the world of fairy tales with me One last look at the world of fairy tales with me

I want you to seriously rethink education.

Let's shift from large lecture halls to cyberspace

Shifting from books to tablets like India's Aakashn, shifting from books to tablets like India's Aakash and 20-dollar Raspberry Pi worlds.

Aakash is $40

We're shifting from brick and mortar schoolhouses to digital dormitories.

But I think, in the end, you'll only need one lecture hall in a university.

Otherwise, when you're talking to your grandchildren, they can't sit in that room, sitting in rows as narrow as corn, and they can't say they saw the professor talk in the corner, or told the lecture, and they didn't even have a rewind button.

Thank you

(Applause) Thank you (Applause) Thank you (Applause)

In 2007, I became Attorney General of New Jersey.

Before that, I was a prosecutor at the District Attorney's Office in Manhattan and the Department of Justice.

When I became state attorney general, two things happened that changed the way I looked at criminal justice.

The first was that I began to have fundamental questions.

What kind of people are we arresting, prosecuting, and sending to prisons and detention centers? Are you sending them to jail or jail?

And are we making decisions that will make society safer and make society safer?

But I didn't get that information.

The big criminal justice agencies, including New Jersey, didn't track the bottom line, they didn't track the bottom line.

Frustrated, I waited a month, and I climbed into a conference room full of detectives, piles of case files, everyone taking notes on yellow report paper.

In order to get the information you need, in order to get the information you need, I had you check all the cases from the last five years.

And as you can imagine, it turned out to be a terrible situation.

Investigations showed that many of the cases they handled occurred around their place of work in Trenton -- relatively low-intensity drug crimes.

The second incident was my experience at the Camden Police Department in New Jersey.

Camden was the most dangerous city in America at the time.

That's why I was put in command of Camden Police Station.

I went to the station that day and was shown to a senior police officer who is doing everything he can to reduce crime in Camden.

When we were talking about combating crime, we saw police officers with lots of yellow sticky notes.

Everyone writes notes on sticky notes, puts them on the board, and reports one after another.

"Two weeks ago there was a robbery -

No suspect information

"Last week there was a shooting incident near here, no suspect information"...

We weren't using the data in our investigation.

It's like trying to fight crime with nothing but a yellow sticky note.

It was these two events that made me realize my fundamental failure.

We don't know who's on trial, we don't have the data we need, we don't share it, we don't even use data analytics and tools to make better decisions and reduce crime.

For the first time, I began to consider the process of reaching judgment.

Both as an assistant district attorney and as a federal attorney, I focused on the case at hand and decided based solely on intuition and experience.

When I became Attorney General and began to see the system as a whole, I made an astonishing discovery that every branch of the justice system made decisions based solely on intuition and experience, be it the police department, the prosecutor's office, the courts, the prisons.

It was clear that it wasn't working, so another way

i felt it was necessary

I thought we needed to introduce data, analytical methods, and rigorous statistical analysis.

It's basically the moneyball of the criminal justice system.

Moneyball, as you know, is how the Oakland A's use data and statistics to find players who can help them win games.

This technique that worked at A's also worked for New Jersey.

Camden has relinquished its reputation as the most dangerous city in America.

Homicides dropped by 41 percent, which meant 37 lives were saved.

Total crime decreased by 26%

We have also changed the way criminal prosecutions are carried out.

Rather than the relatively low-level drug crimes that happen around us, we've focused on statewide incidents such as deterring serious violent crimes and cracking down on street gangs -- gun and drug trafficking and cracking down on political corruption.

All of them are very important, because I believe that public safety is the most important job of government.

If it's not safe, you can't guarantee education or health. If it's not safe, you can't guarantee education or health.

Now this country has serious problems with its criminal justice system.

12 million people are arrested each year

Most of them are low severity misdemeanors, accounting for 70-80%.

Violent crimes account for less than 5% of all arrests

Still state and local, still state and local, it costs 75 billion dollars to rehabilitate criminals.

2.3 million people are currently incarcerated in jails and prisons.

This is a very serious security situation, because two-thirds of the people in the detention center are just waiting for the trial to start.

they were not convicted

I'm just waiting for my court appearance

An additional 67% will reoffend

The state's recidivism rate is among the worst in the world.

Even if 10 people are released from prison, about 7 people will be re-arrested and will repeat crime and prison life.

When I started working at the Arnold Foundation, I looked back at the problems I had, how I used data and analytics to transform New Jersey's criminal justice system.

I believe that the present criminal justice system in the United States has the same challenges as New Jersey, which means that there is still room for improvement, and there is room for improvement.

So what I decided to focus on, so what I decided to focus on is using data analytics to make the most critical security decisions, and one of those decisions is when you decide to arrest someone and decide whether to detain them because they think they're a high security risk, or detain them because they think they're a high security risk, or release them because they think they're a low risk.

This judgment is the starting point for criminal trials.

affects all

For sentencing decisions

In need of drug treatment

It also affects violence and crime.

I've been hearing a lot of stories from judges all over the country lately, and they've all said, "We put dangerous people in jail, and we release people who aren't."

we all believe that

But judges don't have the data, and when you actually look at the data, you often find cases where that's not the case.

Low-risk criminals, who make up 50% of all criminal trials, are in prison.

For example, Leslie Chu from Texas stole four blankets on a cold winter night.

Arrested, but unable to post $3,500 bail, ended up in jail.

He was then held in detention for eight months before his trial began, costing taxpayers more than $9,000.

The situation is serious even in the opposite case

Of the very high risk offenders who are judged to be extremely high risk and who are judged to be very high risk and are released, of the very likely repeat offenders, a whopping 50% are released.

The reason for this is the way decisions are made.

Judges do their best to assess risk, but their judgments are subjective.

We're doing the same thing 20 years ago when baseball scouts assessed risk based solely on intuition and experience.

Judges make subjective judgments, and subjective judgments often lead to errors.

What this field needs is solid data and analytical methods.

What I wanted was hard data and analytical risk-assessment tools -- tools that would give us a scientific, objective picture of the risks that a person in front of a judge might pose.

Nationally, only 5% to 10% of the population used some kind of risk assessment tool, and when we looked at the actual tool, it was easy to see why.

They were all prohibitively expensive to administer, time consuming, and only available locally -- tools.

So basically we couldn't expand the coverage or repurpose it.

So I put together a great team of data scientists, researchers and statisticians to create a risk assessment tool that can be used anywhere, with the goal that every judge across the country can make objective, scientific risk assessments.

Using this tool, we've collected 1.5 million cases from all over the United States -- from city and county courts -- all state courts and federal district courts.

And out of those 1.5 million cases, the largest set of pre-trial case data in the nation, we identified more than 900 risk factors and tried to figure out which ones were the most important.

As a result, we found that there are nine factors that are common across the country and are the easiest to predict risk.

And so we have a universal risk assessment tool.

look at the screen

It requires some input, but overall it's very simple and easy to use. This tool looks at the defendant's criminal record, prison history, involvement in violent incidents, prison sentences, involvement in violent incidents, failure to appear in court.

This tool allows us to make three predictions.

First, it is a prediction of the likelihood of committing another crime after release. First, it is a prediction of the likelihood of committing another crime after release.

The second, which I've never tried before, and I think it's very important, is predicting the likelihood of violent incidents after being released from prison.

I think that's an important factor for any judge.

Finally, appear in court - a prediction of the possibilities.

Any judge in the United States can use this tool because it's based on data that applies everywhere.

Launch the risk assessment tool and the dashboard will appear

At the top is New Crime Score, the highest is 6, and below that is Increased Violence Risk.

This value is used by judges to consider whether the person in question is prone to violence.

And below that, the 'not appearing score' indicates the likelihood of appearing again in court indicating the likelihood of appearing again in court.

Now, there's a point I want to make.

I don't believe that risk assessment should exclude all judges' intuition and experience.

it shouldn't

The problem that we face -- the systemic gross error of putting the non-violent in prison and releasing the high-risk and dangerous -- is the lack of an objective means of assessing risk.

But from now on, I think we should aim to make better decisions by combining data-driven risk assessments with the intuition and experience of judges.

The tool went live throughout Kentucky on July 1 and is spreading to other jurisdictions.

Our only goal is to have judges across the country using this risk assessment tool within five years.

Now, we're working on tools for prosecutors and police officers. The way we do things today is the same as it was 50 years ago, relying on intuition and experience. We want to change this to a data and analytics system.

Yes, we still have a lot of work to do, we need to change the way we think, but the great thing about this change is that it's been proven to work.

Google succeeds in data analytics, and baseball teams use moneyball to win baseball teams use moneyball to win.

And what's great about this approach is that it can improve the American criminal justice system.

Our cities will be safer, our prisons will cost less, our system will be fairer and juster, our system will be fairer and juster.

Some call this "data science"

To me, it's the moneyball of the criminal justice world.

thank you

(applause)

Did you know? Early fertility drugs were made from the urine of Catholic nuns, and even the Pope was involved.

it's a true story

Scientists in the 1950s knew that when women reached menopause, they released more ovulation-inducing hormones into their urine.

A doctor named Bruno Lunenfeld wondered if he could isolate the hormone from the urine and help women who were having trouble conceiving.

But to get started, we needed a lot of urine from an older woman.

it's not easy to get

So he and his colleagues got special permission from the Pope to collect dozens of liters of urine from hundreds of elderly nuns.

So he isolated the hormone that is used to this day to induce ovulation, and it can now be synthesized in the lab without needing tens of liters of urine.

Now, why am I here in front of a wonderfully intelligent audience and talking about nun urine?

I'm a science journalist and multimedia producer who's always fascinated by the disgusting.

So much so that I started a weekly YouTube show called "Gross Science," about gooey, stinky, and chilling stories about natural medicine and technology.

Most people say that urine is a bit disgusting, right?

We don't talk about urine, and urinating requires privacy.

But by looking into the world of urine, Lunenfeld made a discovery that could be very useful to mankind.

After running the show for a year and a half, what I've learned is that when you explore the nasty parts of life, you find unexpected discoveries, and even beauty in the most unexpected of places.

It's important to talk about things that make you feel bad

The first reason is that it's the best way to help with education and sustain interest.

I'll give you an example, when I was a kid.

I may have been a grumpy child

My passion for science began when my parents bought me a slime chemistry kit, and my interest was fueled by a disgusting experiment I did in sixth grade biology class.

Scrubbing surfaces from all over the classroom, culturing the bacteria you've collected, examining pellets of indigestible material that owls vomit, things like that were disgusting but very interesting.

It's no wonder that as a child I was fascinated by disgusting things.

Children usually like disgusting things like playing in the mud, collecting bugs, and eating boogers.

I wonder why?

I think young children are little explorers.

I want to experience many things, so I don't think which is better, touching a ladybug or a stinkbug.

I just want to understand how everything works, I just want to experience life.

It's pure curiosity

But then the adults say, don't pick your nose, don't touch slugs, frogs, whatever you find in your backyard, it's disgusting, and so on.

You're talking about safety, right?

If you pick your nose, you'll spread germs, and if you touch a frog, you might get warts.

Please touch the frog as much as you like

As children get older, exposure to disgusting things is not only a curiosity, but a way to explore what's good and what's not.

When children reach a certain age, they often burp or make funny faces.

This is bad, so I guess they want to do it

But there's another reason why we find things disgusting.

Because disgust is tied to morality.

According to psychologist Paul Rosin, many of the things that make us sick are reminders that humans are just animals.

For example, body fluids, sex, physical abnormalities, death

Thinking that we're just animals can be unsettling, because it reminds us that we're going to die, too.

Such thoughts can lead to worry and fear.

According to Rosin, avoiding disgusting things not only protects your body, but it also protects your mind.

At some point, children will begin to realize the link between grossness and immorality.

I don't have any evidence, but I think you realize this around puberty.

[Adolescent me] Um

During puberty, your body changes. You sweat more, girls start menstruating, and they think differently about sex.

The human ability to think abstractly makes us feel embarrassed.

We don't think, "Something disgusting is happening to my body!"

"Wow! Maybe I'm sick—

I wonder if it's my fault or strange to say that

When you associate grossness with immorality, you lose most of your curiosity, because there's a lot of gross things in the world.

e.g. a walk in the woods

If you focus only on birds, trees, and flowers, it's very beautiful, but I think you miss the great picture of life on Earth.

There's a cycle of rot that helps the forest grow, and there's a web of fungi under your feet that connects you to all the plants around you.

it's really amazing

So we should have early and frequent conversations with children and young people about disgusting things, so that they feel it's okay to see the big picture of life on Earth.

The funny thing is that most people don't lose interest in creepy things, they just pretend they don't exist.

In fact, most of my life I try not to make myself feel bad.

If you think about it, the human body is just a collection of fluids and weird tissues covered in a thin skin.

I tell myself several times each day, consciously and subconsciously, not to fart in public.

(Laughter) Humans are always striving not to be disgusting.

This is especially true with children, as evidenced by the number of middle school teachers who show my videos in their science classes.

But I think adults do too.

We all love listening to creepy stories because it allows us to explore the creepy side of humans.

One more thing, it's important to talk about disgusting things.

I made a video about the knockouts a while back. Sorry folks, knockouts are mucus, bacteria and food clumps that get stuck in your tonsils.

many people have experienced

But those who have experienced it have no place to talk about it.

This video is currently my most popular video

millions of views

(Laughter) The comments section of this video became a discussion section about my own experiences with nousen, tips and tricks to get rid of it.

In this way, I can now talk freely about things that were previously difficult to talk about.

If it's something as silly as Nousen, that's fine, but it's kind of sad when something like that happens with a video about something as mundane as your period.

I uploaded a video about periods in February, and I still get messages from all over the world asking questions about periods.

Many people, young and not-so-young, worry that what's happening to their bodies is abnormal.

Of course, I'm not a doctor.

Ideally, everyone should feel comfortable talking to their doctor about their bodies.

So it's important that we start the disgusting conversation from a young age, so that we can teach our children that it's okay to make decisions about their bodies and their health.

There's another reason why it's important to talk to your doctor about your health and your discomfort.

For doctors and the scientific community to solve a problem, they first have to know there's a problem.

And what I've learned from making videos about periods and talking to scientists is that there's still a lot we don't know about periods.

There's still a lot of basic research that hasn't been done yet.

Part of the reason is that there aren't many scientists who question menstruation, women scientists.

Sometimes it's not a topic to talk about in public.

So we're underinformed because no one is questioning.

One last thing, why is it important to talk about sickness? You have to look inside the sickness to discover what's hiding behind it.

Take the jumbo sea bream in California, for example.

A member of the sea slug that emits a purple pigment to its predators.

They are also the most sexual creatures in the animal kingdom.

They're bisexual, they have both male and female genitalia.

During the breeding season, when there are many, 20 of them line up in a line and mate together.

(Laughter) You fertilize the front sea bream, and you get the sperm from the back, which is pretty efficient when you think about it.

(Laughter) But if a scientist had seen this and said, "Let's not study this," we would never have discovered the most amazing thing about Aplysia.

Aplysia has a small number of very large neurons, which is very useful for neuroscience research.

Scientist Eric Kandel used it to discover how memories are stored in the brain.

What do you think happened after that?

won the Nobel Prize for his research

So go out and catch bugs, play in the mud, and ask questions.

And don't be shy, get curious about the creepy stuff, you might make some interesting discoveries.

Let's end with the closing word I always use in my videos: "Terrible."

thank you

(applause)

McKenna Pope, I'm 14. When I was 13, I asked Hasbro, one of the world's largest toy companies, to change the way they marketed a popular product.

I'm going to talk about it today

I have a brother named Gavin

It all started when he was four years old

my brother loves to cook

I would always take out what I had in the fridge and mix things up and cook them.

It seemed like I couldn't help but want to be a chef

The only thing a child would love to have is an easy-bake oven, right?

Everyone should have something like that

It was the oven for my brother

But then I realized that

Looking at the commercials and packaging for the Easy Bake Oven, Hasbro is clearly marketing to girls only.

Because only girls appear in the packages and commercials, and the oven has a floral design, and the colors are bright pink and purple.

That's why I feel like I'm being told, "Girls do the cooking, boys don't."

my brother was very disappointed

I felt like I shouldn't think about being a chef 'cause girls do it

Girls do but boys don't Girls do but boys don't I got that message from Hasbro

And I thought, "Oh, is there any way I can change this? If Hasbro could hear me, tell me what I'm doing wrong and ask them to fix it."

And then it reminded me of a website I just learned about a few months ago, Change.org.

You can create a petition on an online petition platform, and you can share it using any social media network, like Facebook, Twitter, YouTube, Reddit, Tumblr, whatever you can think of.

So I put together a petition, and I used YouTube to spread the idea, asking Hasbro to change the way it's marketed, to use boys in its commercials and packaging, and to make products with gender-neutral colors.

And this movement began to take off, at an unpredictable, incredible speed.

I was interviewed by various media outlets in the country.

3 weeks, no, it was about 3 weeks and a half, 46,000 signatures.

(Applause) Thank you.

can't believe it

And finally, Hasbro personally invited me to their headquarters and showed me their new Easy Bake Oven in black, silver and blue.

It was definitely the best moment of my life.

It was like the world of "Charlie and the Chocolate Factory" It was such a wonderful moment

But what I didn't realize at the time was that I was an activist I could make a difference Even though I was a child My voice as a child had a huge impact And so did yours

But it's not that easy.

On the internet and even in real life there were people who looked down on me and my family They said it was all a waste of time I was so depressed

Actually, I'd like to introduce you to some of them, because the best revenge is to show off your stupidity, right?

then first

Username Liquid Sword 29 It's an interesting name "Liberalism that makes children gay makes me vomit" Are you serious? that's okay

NextWhite Boy 77AGS "There are always people who want to be flirtatious"

Jeffrey Gutierrez: "Shut up! You just want money and attention." Comments like these made me almost give up trying to make a change, because I thought, "Nobody cares. I just think I'm wasting my time. People are looking at me and my family with contempt."

It hurt my heart And I thought, "What's the point in making a change?"

But gradually I began to think

haters gonna hate

Come on everyone together! 1 2 3 Let those who want to say it say it!

That's right, let them say whatever they want! You can make a change too, because you can definitely do it

So many people, 400 people, came here because they want to know how they can make a difference, and you can do it, and so can you, who's watching this at home.

that way you can change

Stand up for what you believe and make a change based on it

"Inspiration" that came up in various stories today Use that "inspiration" inside of you to light the fire of change

thank you

(applause)

Science, science, teaches us an incredible amount about the vastness of the universe, and it's also tremendously important, and it's so far away, but it's actually so close, and actually more directly related to us than a lot of things that we don't really understand.

And one of them is the amazing complexity of the animal societies around us, and today I want to talk to you about the complexity of some animals.

Well, first of all, what do we mean by "complexity"?

What is "composite"?

"Complex" is not "complicated"

The complexity is made up of many small pieces, all different, each with a distinct role within the organization.

A complex system, on the other hand, is made up of many, many similar elements, and it creates a coherent interaction between them as a whole.

A complex system has many elements that interact with each other, and they act according to simple individual rules and come to emergence.

The behavior of the system as a whole cannot be predicted from individual rules alone.

As Aristotle wrote, the whole is greater than the sum of its parts.

But Aristotle aside, let's take a more concrete example of a complex system,

i have a scottish terrier

First the system is chaotic

And then there's a little force, the milk.

This is what happens when everyone starts heading in a certain direction.

The interaction of the puppies creates a windmill, and the only rule is to push it in any direction to keep it from moving away from the milk.

So it's all about finding simple rules where complexity emerges.

I call this simplification of complexity, and we're working on it in the System Design course at the Swiss Federal Institute of Technology in Zurich.

We collect data on animal populations, analyze complex patterns, and try to explain them.

It requires physicists working side by side with biologists, mathematicians, and computer scientists, and their interactions are interdisciplinary strengths to solve these problems.

Again, the whole is better than the sum of its parts.

The method of collaboration is another example of complex systems.

You may have wondered which side this speaker is on, biology or physics.

Actually, I see it differently, and to explain, I need to tell you a little bit about myself.

As a child, I loved to assemble things to make complex machines.

So I embarked on my studies in electrical engineering, then in robotics, and my last research project was in building a robot called ER-1, and it went something like this -- it gathers information from its surroundings, and it follows the white lines on the ground.

It was very, very complicated, but it worked perfectly in the test room, and on the day of the demo, the professors met to evaluate the project.

And we brought the ER-1 into the evaluation room.

And this is what happened, because the lighting in that room was slightly different.

The robot's visual system got confused.

At the first turn, I went off course and hit the wall.

In the end, it took weeks just to build that robot that broke down just because of subtle changes in the color of the light in the room.

That's when I realized that the more complex the machines you build, the more likely they are to fail, for something you never expected.

And in fact, it was very clear to me that I didn't really want to create something complicated.

I wanted to understand complexity, complexity in the world around us, especially in the animal kingdom.

Now let's talk about bats

The Bechstein bat is a common species of European bat.

they are very social animals

they usually sleep together in the roost

And they live in matriarchal groups, which means that each spring after winter hibernation, the females congregate and stay together for about six months to raise their young.

That's how we explore bat roost relationships, and this is what it looks like.

During the day, the bats roost, breaking up into many small groups in separate hives.

For example, one day the flock may split into two hives, but on another day they may be together in one hive, or they may split into three or more hives, which seems really inconsistent.

But this is called fission-fusion dynamics, and it's a characteristic of groups of animals that regularly split and merge into other subgroups.

So what we do is take all these data from different days and put them together, and apply techniques of network analysis to extract long-term relationship patterns and get a complete picture of the social structure of the herd.

May I? Then you get a picture like this

In this network, every circle represents a node, a single bat, and the lines between them represent social cohesion, associations between individuals.

In the end, this turned out to be a very interesting diagram.

Two distinct communities make up this swarm, something that was unpredictable from the daily split-and-merge movements.

we call them arcane social units

What's even more interesting is that around October each year, the colony splits up and all the bats go into hibernation separately, but each spring when the bats come together again, the community remains the same.

So these bats remember their friends for a really long time

With brains the size of peanuts, they maintain individual, long-term social cohesion. I didn't know you could do that.

We knew that primates and elephants and dolphins could sustain themselves, but compared to bats, their brains are gigantic.

So how do bats maintain this complex, stable social structure with such limited cognitive abilities?

And this is where complexity leads to answers.

To understand this system, we built a computer model of the roost based on simple rules for each bat, and tested it with thousands of days of virtual bat swarms.

It's a mathematical model, but it's not complicated.

To summarize what we learned from this model, each bat knows several members of the colony as friends and tends to choose the same hives as those they know.

Simple rules for each animal

This alone explains the social complexity of these bats.

there's something better

In 2010 and 2011, the herd lost more than two-thirds of its members, probably due to a very cold winter.

The next spring, the community didn't split into two flocks like it used to, and the flocks would have gotten so small that they might have died out.

Instead, they formed a cohesive society, which is how they survived the season and flourished again in the next two years.

It turns out that bats are unaware of these movements in their colony.

Bats simply follow simple social rules, and it's this simplicity that gives rise to the social (complexity) that enables colonies to withstand dramatic changes in population structure.

amazing results

Now, I'd like to talk about something else, but that would require us to move from Europe to the Kalahari Desert in South Africa.

meerkats live here

Of course you all know meerkat, right?

they are fascinating creatures

live in groups with very strict social hierarchies

There is one herd-leading pair and many sub-herds, some acting as guardians, others as babysitters, some teaching children, and so on.

So we decided to put a little GPS on these creatures as collars to see how they move together and what that means for their social fabric.

And here's a very interesting example of meerkat collective movement.

There's a road in the middle of the protected area where they live.

There are cars on this road and it's dangerous.

But meerkats have to cross it to move from feeding station to feeding station.

So we decided to find out how they cross the road.

Usually a female boss leads the herd to the road, but when it comes to crossing the road, the boss leaves it to his subordinates, as if to say, "Go ahead and tell me if it's safe."

In fact, I didn't quite understand what behavioral rules the meerkats followed to cause the group to exhibit these changes at the boundary, and whether simple rules were sufficient to explain it.

So we developed a simulation model of a herd of meerkats crossing a road.

is a simplified model

A moving meerkat is like a random piece, and its unique rule is that it must be oriented.

they simply move together

When these pieces arrive on the road, they feel some kind of obstacle and jump against it.

The only difference between the other individuals and this red herd-leading female is that the height of the obstacles to her, the perceived risk from the road, is slightly higher, and this small difference in the rules of individual movement is sufficient to explain the phenomenon we are observing, in which the herd-leading female leads her group onto the road and gives way to other individuals to be the first to cross the road.

There's a British statistician, George Box, who said, "All models are wrong, but some are useful."

And the fact is, this model is plain wrong, because in reality, meerkats aren't just random bits.

But it's also useful, because it tells us that the extreme simplicity of the motor rules at the individual level leads to a great deal of complexity at the group level.

Again, it simplifies complexity

I would like to summarize what this means for the entire species.

When a herd-leading female gives way to her subordinates, it's not out of politeness.

In fact, the herd-leading female is very important for group cohesion.

If she dies on the road, the whole group is in danger.

So this risk-averse behavior is a very ancient evolutionary reaction.

These meerkats are replicating tactics that have evolved over thousands of generations in antiquity, adapting them to modern risks, in this case man-made roads.

They use very simple rules, and the resulting complex behavior allows them to resist human intervention in their natural habitat.

Ultimately, it could be bats that have changed their societal structures and adapted to a declining population, or it could be meerkats that have found new adaptations to the way humans have made them, or it could be something else.

What I'm trying to say here is not that it's complicated, it's that it's surprising and hopeful that it's easy to understand. It's that animals exhibit a special social complexity, and that allows them to adapt and respond to changes in their environment.

In just three words, in the animal kingdom, simplicity leads to complexity, and complexity leads to resilience.

thank you

(Applause) Dania Gerhardt: Thank you very much Nikola for a great start Are you a little nervous?

Nicola: okay thank you

Dania: Well, I think a lot of people in the room have managed to make connections between the animals you mentioned -- the bats and the meerkats -- and humans.

Here's an example, and although there are many opinions that females are social creatures and herd leaders,

But is it okay to make these associations?

Are there stereotypes that apply across all species on this point?

Nicola: Well, there are some cases where it's the other way around.

For example, in seahorses and koalas, the male always takes care of the young.

What this tells us is that it's difficult, and sometimes a little dangerous, to make comparisons between humans and animals.

that's all

Dania: ok thank you very much for this great start

Thank you Nicola Perony.

(Servant) What's your order?

(Customer) Hmm, what should I do?

(Serving) Grilled registry error Binary brioche RAM sandwich with conficker fritters Script salad with polymorphic dressing Grilled coding kebabs also available

(Customer) Shall I have a RAM sandwich and the finest code 39?

(Servant) Would you like to have dessert with us?

Tracking cookies are recommended

(Customer) Tracking cookies with zombie flavor

(Servant) It was polite

I'll bring it to you soon

(Applause) I've been drawing ever since I picked up crayons, and I've been making flipbooks since I was three years old.

I was three years old when I learned what an animator was like.

I saw it on a children's TV show about different jobs.

When I learned that the anime I saw on TV was made by animators, I thought, "I want to do this too."

I don't remember if I said it out loud or in my heart, but at that moment my life took a big turn.

I've loved animation and art ever since.

I'm a tech fanatic, so I came up with "mean restaurant."

My computer got infected with a virus, and while I was trying to get rid of it, I suddenly had an idea. What if there was a little world of viruses inside my computer?

Will we meet at a restaurant serving viral stuff?

And that's how the "mean restaurant" was born.

When I was four years old, my father taught me how to take a computer apart and put it back together.

From there I fell in love with technology.

I made my first website in HTML and now I'm learning JavaScript and Python.

I'm also working on an animation called "Pollinators."

It's a cartoon about bees and other pollinating creatures and why they matter.

If plants can't be pollinated by pollinators, all living things that depend on them, including us humans, will starve.

So I thought I'd make a team of superheroes out of these cool creatures.

(applause) (loud footsteps) (music) (grunt) (pollinator) Deforestation Saurus! I let my guard down!

I have to call everyone in the pollinator!

(Music) Thank you. (Applause) All my animations are born from ideas, but what are ideas?

Ideas can lead to actions

Ideas are opportunities and innovations

Ideas make the world go round

Without ideas, our current technology, medicine, art, culture and the way we live would not exist.

At the age of eight, I collected my ideas and started a business called Mayan Ideas and a non-profit called Mayan Ideas for the Planet.

(Laughter) I make eco-friendly clothing and accessories.

Now, I'm 13 years old, and I started my business in 2008, but my art career began long before that.

I was so inspired by art that I wanted to incorporate art into everything I do in my business.

I would find all kinds of fabrics at home and say, "This could be a scarf or a hat," and I had a lot of design ideas.

When I put on something that I made, people stopped and said, "Wow, this is so cute. Where can I buy it?"

I thought I could start my business there.

I was only eight years old and didn't have a business plan.

I just wanted to give back by making cute things that were safe for the environment.

My mother taught me how to sew, and I sat on the porch in the back of the house and made ribbon headbands and labeled each with a name and a price.

I started making things like hats, scarves, and bags.

Eventually, my creations began to sell internationally, and I had customers in Denmark, Italy, Australia, Canada, and other countries.

And I had to learn a lot about business: branding, marketing, staying connected with customers, learning to know what's selling.

Eventually my business started to take off.

One day, when I was 10 years old, I got a call from Forbes magazine.

(Laughter) They wanted to write an article about me and my company.

A lot of people ask me, why is my business environmentally friendly? about it

From an early age, I was passionate about protecting the environment and living things.

My parents taught me at a young age to give back and take responsibility for the environment.

When I heard that some of the dyes used in clothing and the processes involved in making some products were harmful to people and the planet, I started to do some research myself, and what I found was that even after the dyeing process was finished, the waste had a negative impact on the environment.

For example, when grinding raw materials or discarding dry, powdered raw materials.

They pollute the air and are harmful to the people and animals that breathe it.

So when I started my business, I had two things in mind.

(Applause) I feel like I'm one of the new entrepreneurs who are not only making successful businesses, but also contributing to a sustainable future.

I think we can meet the needs of our customers without giving up on future generations living in a greener tomorrow.

We live in a big, diverse and beautiful world, and that makes us all the more eager to protect it.

But it's not enough to just think about what's going on in the world.

You have to understand with the heart, because understanding with the heart leads to action.

That's when opportunity and innovation arise, and that's how my ideas become reality.

thank you peace and blessings

(Applause) Thank you very much. Pat Mitchell: You told me about this wonderful woman -- the wonderful parents who are supporting Maya. Where are your parents?

Please Mr. and Mrs. Penn Oh!

(applause)

Most of us will experience some form of trauma in our lifetime.

Sometimes it slips through without any long-term consequences.

But in many cases, painful experiences continue to smolder, leading to flashbacks, nightmares, negative thoughts, and other symptoms that threaten daily life.

This phenomenon, also known as post-traumatic stress syndrome, or PTSD, is not a personal defect, but rather a treatable malfunction of the body in coping with a dangerous experience.

To understand PTSD, we need to understand how the brain processes a wide range of painful experiences, such as the death of a loved one, domestic violence, injury and illness, abuse, rape, war, car accidents, and natural disasters.

These events create a sense of danger and helplessness, which in turn triggers what we call the "fight-flight-freeze" response of the brain's alarm system.

When this alarm is triggered, the hypothalamus, the pituitary gland, the adrenal system, or the HPA axis for short, all work together to send a signal to the parasympathetic nervous system.

The parasympathetic nervous system is a communication network with the adrenal glands and internal organs, and controls heartbeat, digestive system, respiratory system, and other functions.

The signal triggers a chemical chain reaction that sends several stress hormones throughout the body, causing physiological changes in preparation for self-defense.

Your heart rate increases, your breathing quickens, and your muscles tense.

Even after the crisis has passed, stress hormone levels can remain elevated for days, leading to irritability, nightmares, and other symptoms.

For most people, these symptoms subside within a few days to two weeks as hormone levels stabilize.

But for a small percentage of people who have experienced trauma, the problem lingers, sometimes disappearing for a while and then reappearing months later.

We don't fully understand what's going on in the brain, but one theory is that the stress hormone cortisol keeps the fight-or-flight-freeze response going, while at the same time it slows down overall brain function and causes a number of negative symptoms.

These symptoms fall into four main categories: intrusive thoughts, such as dreams and flashbacks; avoidance of things associated with the trauma; negative thoughts and emotions, such as fear, anger, and guilt; and "reactive" symptoms, such as irritability and sleep disturbance.

Not everyone develops all symptoms, and the severity and duration of symptoms vary from person to person.

PTSD is often diagnosed when the problem persists for more than a month.

Risk factors such as genetics, ongoing excessive stress, pre-existing mental disorders or lack of emotional support, and other risk factors, such as pre-existing mental disorders or lack of emotional support, can help determine whether a person is likely to experience PTSD.

But the underlying cause remains a medical mystery.

The difficulty in coping with PTSD is that the brain is highly sensitive to the physical and emotional stimuli that it associates with the original trauma.

Even everyday sensations that aren't inherently dangerous can provoke strong physical and mental reactions.

For example, the smell of a campfire might trigger a trapped memory of when your house caught fire.

In people with PTSD, the memory triggers the same neurochemical chain reaction as the original event.The memory triggers the same neurochemical chain reaction as the original event.

As a result, it evokes feelings of panic and helplessness, as if we were reliving the trauma.

Sometimes trying to avoid triggers that strike at unexpected times can lead to isolation.

It can make you feel alienated, ignored, or misunderstood, as if your life just hit the pause button, leaving you alone and the world around you moving forward.

but there is a choice

If you think you might be suffering from PTSD, the first step is to get evaluated by a mental health professional who will direct you to a number of resources.

Psychotherapy can be very beneficial for PTSD and can help you better understand your triggers.

There are medications that can make symptoms more manageable, and self-care practices like mindfulness and regular exercise can help.

What would you do if a friend or family member showed signs of PTSD?

Social support, acceptance and empathy are key to support and recovery.

Tell them that you believe what they are going through and that you do not judge their reaction.

Recommend psychiatric evaluation and therapy if they have room for acceptance.

PTSD is also called "invisible scars" because it cannot be seen from the outside PTSD is also called "invisible scars" because it is not visible from the outside

But even if it's an invisible disability, it doesn't mean that it doesn't show symptoms.

When mathematicians saw an abstract rectangular painting by Dutch painter Piet Mondrian, they came up with a two-step problem.

First, we fill a square canvas with squares that don't overlap.

They all have to be different squares. If you use a 1x4 square, you can't use a 4x1 elsewhere, but a 2x2 is fine.

let's do it

Let's say you have a 4x4 square canvas.

You can't just split it in two in the middle, because that would create two identical 2x4 squares.

3x4 and 1x4 squares are fine.

So far it's been easy, but we're not done yet.

Then subtract the area of ​​the smallest square from the area of ​​the largest square.

The result is a score. The goal is to get the lowest possible score.

In this case, the largest area is 12 and the smallest is 4, so the score is 8.

I wasn't thinking about the score earlier, so maybe I can do better.

Let's leave the 1x4 square as it is and decompose the 3x4 square into 3x3 and 3x1.

Current score is 9-3, 6

It's still not optimal, but it's better than before.

With such a small canvas, you don't have many options.

Now let's see what happens with a larger canvas.

Think about it on an 8x8 canvas, what is the smallest score?

Pause here if you want to think for yourself.

Up to Answer: 3 Up to Answer: 2 Up to Answer: 1 As a start, divide the canvas into two roughly equal halves as before.

Now you have a 5x8 square with area 40 and a 3x8 square with area 24, giving you a score of 16.

That's a pretty bad score.

If you divide a 5x8 square into 5x5 and 5x3, you get a score of 10.

better than before but still

We can continue to divide the largest squares.

But then you get smaller and smaller squares, widening the gap between maximum and minimum.

Our goal is to narrow the range of square areas we use.

The total area of ​​the canvas is 64, so the sum of the areas of the rectangles must be 64.

Make a list of candidate quadrilaterals and their areas

To get a lower score than the one above, you could try using, say, squares with areas up to 9 and adding them up to 64.

And do you see that there are things you can exclude, like 1x13, 2x9, and so on, that don't fit on the canvas?

There's more. If you use odd-area rectangles like 5, 9, 15, you'll need another odd-area rectangle to make the sum even.

With all these things in mind, let's think about

If you start with an area of ​​20 or more, you'll quickly go over the limit.

But you can add squares with areas between 14 and 18 to get 64, not squares with area 15.

Unfortunately, there's no way to fit these rectangles into the canvas.

Because using a 2x7 square leaves a space that can only be filled with a square of width 1.

If we look at the smaller values, the next acceptable range is 8 to 14. We don't use 3x3 squares.

This time it subsided

Now the score is 6

Can we do better?

you can't

If you don't use the 2x7 and 1x8 squares and replace them with 3x3, 1x7 and 1x6, you get the same score.

But as you go further down the list, the area becomes so small that you have to widen the area to fill the canvas, which increases your score.

No tricks, no formulas, just a little intuition.

It's more art than science

With larger squares, even good mathematicians can't be sure that the score they get is the minimum.

How would you divide a 4x4 10x10 32x32 canvas?

Post your test results in the comments

There are about 40 muscles in the human face that can be moved in different combinations to create a myriad of facial expressions.

But do these facial expressions look the same and mean the same in every culture around the world?

Can a smile look like a frown?

Charles Darwin theorized that facial expressions are a common human trait.

But this opinion was in the minority

Until the mid-20th century, many researchers believed that facial expressions of emotion were learned and varied across cultures.

Personality theorist Sylvain Tomkins was one of the few who disagreed.

Tomkins argued that certain "emotions"—feelings and their associated facial expressions—are universal.

In the 1960s, psychologist Paul Ekman examined hundreds of hours of footage documenting remote tribes cut off from modern society to test this theory.

Ekman found that not only were the facial expressions of the local people familiar, but they were also produced in exactly the most predictable situations.

Conversely, he also tested tribes that had no exposure to Western culture.

They were able to correctly combine different facial expressions for stories meant to evoke specific emotions.

In the decades that followed, further research confirmed Darwin's idea that some of the major facial expressions were universal.

But cultures vary greatly in the degree to which facial expressions are appropriate for a given situation.

For example, researchers who studied the facial expressions of people who were born blind hypothesized that if facial expressions were universal, we should be able to observe the same facial expressions as sighted people.

In one study, visually impaired athletes and sighted athletes had the same facial expressions when they won or lost a game.

We also see further evidence in our evolutionary relatives.

When we compared facial expressions in humans and non-human mammals, we found similarities in the structure and movement of facial muscles.

Chimpanzee laughter is different from human laughter, but some of the muscle movements are the same.

In the '60s, Ekman defined six major facial expressions.

"Anger" is accompanied by a lowered brow frown, the eyes tighten and narrow, and the lips tighten; "Disgust" pulls the lips upward and wrinkles the nose.

"Fear" raises the eyebrows, revealing the whites of the upper eyes and opens the mouth wide. "Surprise" is similar, but with curved eyebrows and a loose mouth.

"Sadness" is expressed by the inner corners of the eyebrows being pulled upward, the eyes weak and the corners of the mouth drooping.

Of course, there's the euphoria, too.

More recently, researchers have added new facial expressions such as "contempt," "embarrassment," and "frustration," but opinions differ about how these categories are delineated.

If researchers like Ekman are right, what makes facial expressions universal?

And why is it expressed in a certain way?

Scientists put forward a variety of theories that stem from evolutionary history.

One of them is that certain facial expressions are important for survival.

"Fear" and "Surprise" tell others of impending danger.

Studies in humans and other primates show that we tend to pay more attention to expressions of danger than to uncertain expressions, especially when we're alert.

In some cases, the fitness of a group can be improved by communicating one's state through facial expressions.

For example, grief tells a group that something has happened.

There is also evidence that facial expressions are directly linked to physiology.

For example, they say that the "frightened" facial expression can directly increase your survival in potentially dangerous situations by allowing your eyes to absorb more light and your lungs to take in more oxygen, preparing you to fight or flee.

Especially as we learn more about how the brain functions, understanding facial expressions requires a lot more research.

But if you're surrounded by people you don't know in an unfamiliar land, I'm sure your smiling face will come across.

"How many painkillers are you taking?"

This is the routine question that changed my life.

It happened in July 2015, about two months after I nearly lost my leg in a terrible motorcycle accident.

I was visiting the orthopedic surgeon's office, which I had already visited many times, for a follow-up appointment.

When I saw my wife Sadia, we did the math together.

"About 115 milligrams of oxycodone."

"I don't know if it's a little more."

I answered curtly, because I've already given the same answer to many doctors many times, but this time the response was different.

The doctor suddenly took a serious look and looked me in the face and said, "Travis, you've got a lot of opioids.

You should consider stopping the drug now."

This was the first time in the two months of increasing doses that concerns had been raised.

In fact, this was the first time we had a proper conversation about the opioid therapy I was on.

There was no warning about this therapy, no counseling, no treatment plan.

It was just a lot of prescriptions

What happened next was the exact medical trauma I experienced.

I later found out that the abrupt dose reduction plan that I was instructed at the time was to gradually reduce the total amount I was taking at that time by dividing it by 4 every week for a month.

The result was acute opioid withdrawal in my body.

The result was - in other words, a hellish experience.

The early symptoms of withdrawal resemble a severe flu.

Nausea, loss of appetite, aches all over the body Increased pain in my crushed leg I became more restless and unable to sleep at night

I felt it was a pretty miserable experience at the time.

I thought so because I didn't know what was going to happen next.

It got worse when the second week started.

The symptoms were even worse, like my body's thermoregulation was out of whack.

I was sweating profusely, but when I barely made it outside, I found myself getting goosebumps in the hot August sun.

I've come to believe that the restlessness that caused my sleeplessness in the first week was a sign of withdrawal.

Deep-rooted irritation makes my muscles twitch

sleep became almost impossible

But the most confusing thing was the sudden crying

For no particular reason, without warning, tears began to flow.

It was an abnormal nervous excitement, akin to goosebumps.

His worried wife, Sadia, contacted him, and the only "kind" advice from the doctor who prescribed the medicine was to drink plenty of fluids to help with the nausea.

My wife insisted to the doctor, "You're feeling pretty bad," and the doctor said, "If it's that bad, go back to your previous dosage for a little while."

"After that," I asked anxiously.

"Try again when you're healed," the doctor said.

I was adamantly against going back in, unless I had a solid plan for getting through the next possible withdrawal.

We decided to go ahead with the plan, dropping the quantity by another notch.

From the beginning of the third week I was plunged into darkness

The food didn't go down my throat very well, and I got very little sleep because of the irritability that kept me writhing all night long.

But the worst thing was- despair

The sudden tears I thought had no meaning now felt like they had meaning

Many times a day, I knew that my emotions would well up and tears would come to my eyes, but I couldn't control them.

From the aftereffects of the accident and from the withdrawal symptoms of the drug, I came to believe that I would never recover.

Sadia spoke to the doctor who ordered the prescription again, and this time she suggested that I contact the person in charge of the pain management team from the previous admission.

I thought this was good advice, so I called them right away, but what surprised me was that no one wanted to deal with us.

The receptionist who answered the phone told me that the pain management team could only serve hospitalized patients, prescribe opioids for pain relief, but not tapering and withdrawal.

Indignantly, I contacted my first doctor again and asked him to do something about it -- anything that would help me in my struggle -- but the doctor apologized and said that this was beyond his expertise.

"Look," the doctor continued, "my original instructions were clearly inadequate, so the official advice now is to put Travis back on his original dose and wait until he finds someone who can guide him through proper withdrawal therapy."

Of course, I also wanted to go back to drugs.

I was struggling

But when I turned to drugs again to escape the pain, I was convinced that I would never be free from this drug addiction again.

When my brain started experiencing opioid-free states for the first time in months, I thought I was going to die.

I was prepared to die (crying) Excuse me.

(Crying) I thought that if this pain didn't kill me, I would end my life.

I know it sounds exaggerated, and it's dramatic, even to me, standing here now, years after it happened, in a healthy body.

But I believed it to the core of my body, and at that point, I had no hope of ever returning to normalcy.

The insomnia became unbearable. After about two days of almost no sleep, the next day I spent the night on the bathroom floor in the basement of our house.

Alternately, I tried to cool my hot head on the cold tiles on the floor, and tried to vomit violently, even though I hadn't eaten in days.

At dawn, when Sadia saw me, she was horrified at what I was doing and jumped on the phone again.

I called all kinds of people

Whether it's a surgeon, a pain specialist, or a family doctor -- anyone I could find through a web search -- and still no one was there to help me.

A few people I spoke to directly on the phone advised me to take the previous dose of medicine.

Another pain management clinic told me that they would prescribe opioids, but they wouldn't advise me to taper off or withdraw.

I wonder if my voice conveyed the same kind of desperation that I'm feeling right now. The receptionist sighed heavily and said, "Leader, what you need is a rehab facility or a methadone therapy facility."

I had no other choice, so I accepted what she said.

When I hung up, I called these facilities, and what I quickly learned was that most of them were for long-term drug addicts.

When it comes to opioid addiction, most of the time, it wasn't gradual withdrawal, but a change to a safer, longer-acting opioid, methadone or buprenorphine.

Plus, most of the facilities I called had long queues.

It didn't fit the category of patients that a facility like this would accept.

After the rehab facility turned my back on me, I finally gave up.

Heartbroken and devastated, I couldn't take it any longer.

Inform Sadia of your decision to take the medicine again.

I decided to start with the lowest dose necessary, and only when I felt absolutely necessary, to take the lowest dose that was enough to overcome the worst withdrawal symptoms.

That night, my wife helped me climb the stairs and I fell asleep in bed for the first time in weeks.

I have an orange bottle of medicine on the bedside table.

without touching the medicine

I fell asleep, and I slept through the rest of the night, and when I woke up, my most distressing symptoms had dramatically lessened.

I finally reached the possibility of survival

(Applause) Thank you for the applause. I had exactly the same reaction.

(Laughter) So, excuse me.

I think this story of mine is very important

It's not because I think I'm special.

This story is important precisely because I'm not unique -- it's not particularly unusual what happened to me.

My opioid addiction was totally predictable given the amount and duration of treatment prescribed to me.

Addiction is simply the brain's natural response to being opioid-rich, and given that, from the beginning there was a need for a proper, supervised withdrawal plan, but the current healthcare system does not determine who is responsible for patients like me.

The prescribing people thought, from a pain medicine standpoint, that I had a complicated case that required special care.

From a pain doctor's point of view, their job was to control the pain, and when I was stuck on drugs, I thought it was the jurisdiction of drug addiction medicine.

However, drug addiction medicine places too much emphasis on focusing on long-term addicts.

In a nutshell, the drugs I was prescribed needed long-term supervision, but they weren't being supervised, and it wasn't clear who was in charge of it.

Disasters like this are bound to happen. Disasters like this are going to get attention, they should be talked about -- they're probably worthy of a TED Talk. The lack of attention to opioid reduction is a big problem in American society, especially right now, because we're in the midst of a massive addiction problem, and in 2015, 33,000 people died from overdoses.

Half of these people are victims of prescription opioids.

The medical community has begun to respond to this crisis, but most of the responses have been to limit drug dosages, which is important, of course.

For example, it's becoming increasingly clear that when it comes to opioids, American doctors tend to prescribe them, often when they don't need to.

And even if you need opioids, you're prescribing more than you need.

So when you look at it this way, it just goes to show that the United States, which I mentioned earlier, is 5 percent of the world's population, but it's almost 70 percent of the world's population consuming opioids.

By focusing only on frequency of prescriptions, we may miss two other important things.

The first is that there is a real need for opioids and they will continue to be essential drugs for pain management.

As someone who has suffered from severe pain for a long time, I can tell you that there is value in living on these drugs.

And second, we can address the problem of overdosing by requiring prescribing physicians to manage their medications appropriately, while still prescribing them prudently to patients who really need them.

For example, if I reconsider the taper therapy that was prescribed to me,

Are we expecting too much from the prescribing physician to realize that the weight loss is too drastic?

When I first published my story in an academic journal, the Centers for Disease Control and Prevention sent me a guide to tapering opioids.

This is a four-page manual, but it's mostly illustrations.

This guide tells physicians about tapering therapy for opioid dependence in mild cases, and one of the recommendations is to never taper more than 10 percent in the first week.

If my doctor had followed this recommendation, my weight loss would have taken months instead of weeks.

Even with a proper weight loss plan

It wasn't easy, and it certainly wasn't easy, but it certainly wasn't hell.

Shouldn't this kind of information be in the hands of those who prescribe this drug?

And finally, I would like to say that well-controlled opioid therapy alone will not solve this problem.

That's not enough for what's going on in American society. But if the drug is responsible for the deaths of tens of thousands of people each year, there is no excuse for the irresponsible management of this drug.

Helping patients wean off prescription opioids isn't the perfect solution to this problem, but it's certainly an improvement.

thank you

(applause)

Imagine how transformative the 1980s were for women who were victims of violence.

When they saw the woman in the emergency room, the police said it was just a "fuck-fight." It's pretty obvious that the woman had been brutally beaten. Her nose is broken, her wrists are broken.

As activists, we took a picture of them with a Polaroid camera, and after 90 seconds, we gave them the picture.

That's how she gets evidence for her lawsuit.

we make the invisible visible

I have been doing this activity for 30 years

I've been involved in social movements to end violence against women and children.

Throughout my work, one thing that I have held strongly, though sometimes unacceptable, is the belief that these violence are not inevitable, but acquired, and if so can be stopped and prevented.

(Applause) As for why I believed

because it's true

it is an absolute fact

Between 1993 and 2010, domestic violence against adult women in the United States decreased by 64 percent, which is great news.

(Applause) Why was the 64 percent reduction achieved?

It's a surprising fact

Thirty years ago, women didn't speak up when they were beaten, stalked, and raped.

there was no justice

As an activist, I can't keep quiet

As a first step, we organized and created a secret women's network to shelter the injured, build shelters, and if we couldn't build shelters, we would open up our homes and keep women and children safe.

In addition

I sold cakes, I washed cars, I did everything to raise money, and when I had some money and I was ready, I went to the federal government and asked them to pay me for this wonderful service.

Not a good idea, is it? (Applause) And the second step, I knew we had to change the law.

So I went to Washington and campaigned for the bill to pass.

I'm in my thirties and I have a mission to fulfill, and I never thought I'd walk the corridors of the Capitol and find someone standing against the enactment of this important piece of legislation.

When I was 30 and naive

I found out that a member of Congress disagrees with us.

What do you think that senator said?

It's a "method that robs you of the joy of marriage."

"Laws that rob you of the joy of marriage"

It happened in America in 1984. I wish I had Twitter! !

(Laughter) Ten years later, we finally passed the Anti-Violence Against Women Act, a life-changing bill that saved so many lives. (Applause) Thank you.

I'm proud of the legislative changes that I've made as part of this effort, and I've been able to funnel millions of dollars into our communities.

I collected more data

Actually, I'm a data lover.

I'm a data geek

I think you'll see a lot of data geeks today.

I'm a data nerd, too. The reason I do this is to make sure that the money is spent correctly and the program succeeds.

And the other thing I want to say is that building more prisons and shelters won't solve this problem.

Empowering women economically, healing wounded children, and preventing violence.

This is the third step of action. If you want to move forward, you need to raise your voice, make it visible, and involve many people.

I knew what to do, so I asked the public service announcement agency to help me with an awareness campaign.

We looked at the situation in Canada, Australia, Brazil, Africa and the rest of the world, and brought together all of our knowledge to launch the first national awareness campaign, "Don't Tolerate Domestic Violence."

Let's take a look at one of the CMs

(man) where is dinner

(Woman) I thought I wouldn't eat anymore, so I put it away ― (Man) What is this? Is it pizza? (Woman) I was ready when you called me. (Man) What about dinner? Is pizza for dinner? (Woman) You, don't shout

Stop it!

(Man) Go to the kitchen! (Woman) No! help!

(Male) Let me know! (Slaps a woman) Did you know! Did you know! (glass breaks) (woman) Help me! !

"The kids are watching. What's your excuse?" While preparing for this campaign, O.J. Simpson was arrested for the murder of his wife and her friend.

It turned out that he himself was a repeat victim of domestic violence.

The media were glued to this news

The news about domestic violence began to make the front page, either from the platitudes or from the rejected manuscripts.

Our advertisements spread through the media, and for the first time women began to share their experiences.

It caught the momentum that the movement needed.

Meaning about it

How many stories about domestic violence were in the New York Times before 1980?

there are only 158

And in the 2000s, the number of articles is 7000

You could say we made a big change

Yet we miss an important point

It's the fourth step, male power

We can't solve this problem without involving 50% of the population.

As I said, I'm a data geek.

Polls show that men feel stigmatized and try to stay out of it as much as possible.

how can you get men involved

How can we get men to talk about violence against women and girls?

A male friend advises me that men shouldn't talk about violence against women and girls, because men don't talk in the first place.

(Laughter) Sorry, male audience.

you will raise your voice

the friend just said

A man as a parent and a leader

I tell my children

so i did this

We went to where the men were and created a program.

When I was creating this program, there was something that will stick in my mind for the rest of my life. A basketball coach was talking to a wide range of men, including male athletes, and telling this story.

I was talking about the importance of developing healthy youth and changing locker room culture, how to build healthy relationships.

And suddenly he found himself in the back of the room, where his daughter was, and he called her name, Mikaela, "Mikaela, come here."

She was nine years old and shy, because when she went to her father's side, he told her to sit next to him.

she sat right next to her father

The father hugged his daughter and said, I am often asked why I tell these stories.

That's because I'm her father, so please don't hurt my daughter.

As a parent, I instantly understood what he meant.

It's just that many sexual assaults happen on college campuses and they just don't get it.

We have done enough work with adult women

From now on, I will focus on activities for children.

(Applause) We've come a long way since the Polaroid days.

technology was our best friend

Mobile phones have expanded women's influence and caused a global upheaval. Facebook, Twitter, Google YouTube, all these social media outlets have helped us tell our stories in a powerful way.

Thank you very much to everyone in the audience today who created such apps and sites.

that's really great

(Applause) I'm an optimist inherited from my father, who was in the optimism club all his life.

You can't make that part easily.

It's his belief, it's his hope, it's in my DNA.

I've been doing this for 30 years, and I'm more convinced than ever that people have the power to change.

We have the power to change history towards compassion and equality, and ultimately, we believe fervently, that violence is not a human trait.

So please stand with us to create a future without violence for women, girls, men and boys.

thank you

(applause)

Five years ago, I was a doctoral student wearing two straw sandals.

First, I was using NASA's supercomputers to build the next generation of spacecraft. Second, I was a data scientist looking for people who could steal sensitive nuclear data.

As a data scientist, I've done a lot of analyzes of many industrial facilities around the world.

And I was looking for a good idea to tie it all together.

One day, I was thinking about how all data is geolocated, and I realized that the answer was right in front of me.

I'm a satellite engineer, and I never thought of using satellite imagery in my work, and now, like all of you.

I'm online and I can see my home, so I'm going to jump in there and look for that facility.

and found something amazing

The photos I was looking for were years old, and they didn't do anything for my current job.

But that's what got me interested

satellite imagery is very nice

We now have millions of satellites all around us, but there's a lot we don't know.

How big is China's oil reserves?

What is the production volume of corn?

How many ships are anchored in ports around the world?

In theory, satellite imagery could answer those questions, provided the photos aren't old.

If these images are valuable, why can't we get up-to-date data?

These stories have been around for 50 years, when the U.S. government launched its first reconnaissance satellites.

Many of the successors to the Cold War-era satellites are now operated by private companies, and many of the pictures we see were taken by those satellites.

Right now, it costs millions of dollars just to launch a satellite into space on a rocket.

And so the satellites got bigger and more expensive, about a billion dollars each.

There aren't that many satellites because they're so expensive.

So the images we usually see tend to be out of date.

In fact, as most people understand, to visualize how the data we collect on Earth is scattered, we've put together 30 million images collected by satellites between 2000 and 2010.

The vast blue area is photographed less than once a year, and the red area is photographed frequently, but still not every three months.

For aerospace engineering graduates, this data poses a big challenge.

Why is this data so expensive?

Why does one satellite cost as much as three Boeing 747s?

Isn't there a way to make new satellites that are smaller and simpler? It is an artificial satellite that can be photographed in a timely manner.

I know it's kind of crazy, but we started designing a new satellite, and we were lucky enough to have some help.

In the late 1990s, several professors came up with ways to significantly reduce the cost of sending equipment into space.

Hitchhiking on a small satellite next to a larger satellite.

This brought the cost down by a factor of 100 or more, and all of a sudden, it allowed us to experiment and innovate a lot.

A new generation of engineers and scientists, mostly from academia, has started launching small, bread-pouch-sized satellites called CubeSats.

It's made out of electronic components I got at a home center.

Ideas from the early stages of development when I started designing a satellite with a friend have been put to good use.

I don't remember the exact date when I made the decision to develop satellites, but from the day I had the idea to think of the world as a dataset, to acquire massive amounts of data representing the global economy, to unearth previously unknown relationships, I didn't care about anything else.

We were stuck in a windowless office in Palo Alto, and we started developing prototypes based on simple designs.

The first problem we had to solve was the size of the object.

In space, size is directly related to cost. We were working on a satellite the size of a small breadcrumb, but the laws of physics tell us that the image quality of this satellite is limited.

This is the image quality I was expecting

It's cheap, but it's too blurry and, frankly, not likely to be useful.

There, over the course of three or four weeks, I met a variety of engineers who were involved in the early development of private satellites. They told me that in the 1970s, the U.S. government had found a powerful and optimal trade-off: if you took images at one-meter resolution, you could see things at one-meter size.

The first thing that simulations tell us is that you need at least one meter to see the global economy's bearers -- the ships, the shipping containers, the trucks all around us -- you can't count the people.

found a compromise

You'd have to build a satellite that's bigger than a bread pan, maybe a small refrigerator, but it doesn't have to be as big as a pickup truck.

due to physical constraints

I know the minimum size of the telescope

The next question is how to keep the rest of the satellite as small and simple as possible: telescopes that fit in an enclosed box and electronics that are smaller than a phone book and consume less than 100 watts.

The big challenge is actually taking images through the telescope.

Classic satellite photography uses a line scanner, which is similar to a photocopier. It takes pictures as it traverses the globe, and scans over and over again to complete the image.

It has a lot of light, and it's the current mainstream method.

The challenge is that it requires very precise pointing.

From 1,000 kilometers up, you have to keep track of targets 50 centimeters away, while flying at 7 kilometers per second, which is very advanced.

So we turned to next-generation video sensors, originally used in night vision goggles.

Instead of using high-quality images, we use video streams. Each image has noise, but we can combine them into high-quality images. High-precision image processing technology makes this possible at 1/100th the cost.

We applied this technology to other satellite systems, and day by day our designs evolved, from CAD to prototypes to finished products.

A few weeks ago, we completed SkySat 1, signed it, and said goodbye to our last time on Earth.

It's now mounted on a launch pad and will be launched in the next few weeks.

And we're going to launch 24+ satellites very soon, and we're going to start doing big-scale analytics, and we're going to be able to get a lot of insights from petabytes of data.

what is our purpose? Why are satellites made?

In short, satellite imagery provides global transparency, and real-time transparency is exactly what we need right now.

We are building a new era, and little by little we will unlock the story of humanity beyond just economic data.

As a data scientist, I feel like a kid going to space camp. There's nothing more exciting than this.

thank you

(applause)

You've probably seen a lot of articles about climate change, and this is an article from the New York Times, one of the most common articles.

It does not contain anything new

Even the headline is the same as before

The only difference is that this article was written in 1953.

The reason I say this is because you probably think climate change is

It's a relatively recent problem, and now that the Kyoto Protocol and inter-governmental policies have been set to resolve it, and we're actually starting to take action, I think we're on the path to solving the problem.

Actually... NO

We've known this problem for 50 years.

We've been arguing over and over for the last 10 years.

the result is almost zero

This shows the rate of increase of CO2 in the atmosphere.

I'm sure you've seen it in many ways, but I think you've never seen this graph before.

This indicates that the rate of increase in CO2 emissions is accelerating sharply.

It's growing at a faster pace than it was a few years ago when it was thought to be the worst.

Many skeptics argued about the red line that "environmental researchers have made pessimistic predictions," and they also said that "emissions won't grow faster than the red line."

But it's actually growing much faster.

Here's the data from just 10 days ago, the smallest amount of ice in the Arctic Ocean this year, the lowest ever.

Also, ice loss is progressing at a much faster pace than modeled data.

Experts like me are flying around the world, consuming jet fuel, and politicians are signing treaties, but the reality is that the benefits of these actions are virtually negative. We're just consuming a lot of jet fuel. (Laughter) It's true! In terms of this very inertia, which is necessary to put the brakes on our huge economy, we haven't even acted yet.

Here's the situation - I've done very little [caricature: desk theory]

i don't want to disappoint you

We can definitely solve the problem, and in a fairly low-cost way.

And by cheap, I mean that it's on par with military spending, not as low as medical and welfare spending.

It means a few percent of GDP

You see, this sense of scale is very important.

The problem is solvable, and what we have to do is to do something about electricity production, which accounts for about 43 percent of our carbon emissions and is increasing emissions.

All you have to do is take completely sensible actions, like saving electricity, wind power, nuclear power, carbon dioxide storage -- these things can always be deployed and implemented on a large scale.

But we haven't invested in making these facilities actually work.

we're just spending time debating

But that's not what I want to talk about tonight.

tonight is about what we can do if we don't do anything

It's about the middle of this -- what happens if we don't put carbon caps in place soon enough.

And breaking the link between human behavior that drives climate change and climate change itself, which is especially important, because we can adapt to climate change, and I think, frankly, we'll also benefit from climate change.

It's definitely a bad idea, and I've been doing research to stop it.

But the political difficulty is that there are winners and losers, and it's not just the losers.

But of course the natural world and polar bears

- You once skied on ice fields in the far north for a few weeks.

All those things are losers.

they cannot adapt to the environment

But we can definitely solve the climate change problem.

Geoengineering, in a nutshell, is something like

Particulate matter, especially sulfate salts and sulfuric acid microparticles, dispersed in the upper atmosphere, the stratosphere, reflects sunlight and lowers the temperature of the earth.

I know it works for sure

It's not without side effects, but it's always effective.

Effectiveness has already been proven

Nature proves that no one else

This is the Pinatubo volcano in the early '90s, spewing sulfur into the stratosphere and creating what looks like a mushroom cloud.

the results were very dramatic

And you can see that in the volcanic eruptions that have happened since, or even before, the temperature of the atmosphere has dropped dramatically.

The graph below shows the temperature of the upper atmosphere in the stratosphere, which increases after an eruption.

But in the graph above, the temperature in the lower atmosphere and on the surface is going down, because the atmosphere is slightly blanketed.

there is no big mystery

There are a lot of unknowns about the details, and there are side effects, like partially depleting the ozone layer, which I'll get to later.

Lowering the temperature is obvious

and rapidly

And this is very important, because most of the things we have to do, like slowing down the growth of emissions, are inherently time consuming, like getting the hardware to reduce emissions, like.

And even if we cut emissions, we won't reduce their concentration, because concentration, or the amount of CO2 in the air, is the sum of all the emissions that have been emitted.

Therefore, it is impossible to brake suddenly.

but do it quickly

And there will be times when you want to get things started quickly.

You're probably wondering if this works

Can it block sunlight from entering, effectively offsetting the increased CO2, and restore the climate to what it once was? and

The answer seems to be "yes"

You've probably seen this graph before

Here's a graph of what the world would look like under a particular thermal model, with twice as much CO2 in the air.

The graph below shows that if the CO2 doubles and the sun's rays decrease by 1.8%, the temperature will return to what it was before.

This Ken Caldeira graph was born at a conference in the mid-'90s, and I think Marty Hofert was also there -- Ken and I said, "Geoengineering fails."

And he commented to his proponent at the time, "The atmosphere is more complicated."

I've given you many reasons why CO2 doesn't offset well.

Later, when Ken ran his model, it actually worked.

this is also an old story

I was two years old when this report was presented to President Johnson in 1965.

In this report, which included the latest climate science at the time, the only specific action was geoengineering.

CO2 emissions reduction wasn't even mentioned, and the thinking was incredibly different.

I don't think we don't need to cut emissions.

We should reduce it, but that's exactly the point.

So in some ways it's not a new idea.

The only new thing is this review

So this is, through the Johnson-era reports and the 1977, 1982, 1990 reports of the National Academies, people have been talking about this idea all the time.

Not certain, but something to consider

But when the topic of climate becomes politically "hot," as a pun, for the last 15 years, it's been considered inappropriate and not even discussed.

The discussion wasn't even allowed to be brought up in public.

But last year, when Paul Crutzen published this essay, he wrote that, in general, given the very slow progress and uncertain impact on solving the problem, we have to think about it.

like it's been said

Importantly, he won the Nobel Prize in Chemistry for his work on the ozone hole.

When he said we should take this issue seriously, people took notice, despite the impact on the ozone layer.

In fact, he also had the idea of ​​wiping out the impact on the ozone layer.

It got media coverage all over the world, and the headline in The Economist said, "Dr.

So I thought, I've been working on this from time to time, but it's not very technical, and I lay in bed one night and thought,

So I was thinking about children's toys, and as the title goes, I wondered if I could use this principle of radiometer rotation to scatter particles into the upper atmosphere and keep them levitated.

One of the problems with sulphate spraying is its very short atmospheric residence time.

It's also depleting the ozone layer, so it's better to introduce it higher than that.

I woke up the next morning and started doing the math.

Calculations from first principles were difficult and frustrating.

But I realized that there were already many papers on this subject, and this was already happening in nature.

Already there are particles that are floating up to 100 kilometers above what we call the intermediate layer.

I will teach you the principle

The intricacies are really interesting, and I could happily talk to you all night, but I won't.

Now, when the sun's rays hit the particles, they weren't evenly heated.

So the side facing the sun stays warm and the other side stays cool.

Gas molecules that hit the warm side are heated and bounce faster.

The sum of the forces is pointing away from the sun

so-called photophoretic force

My collaborators and I are devising different ways to use this principle.

Of course, we could be wrong -- this hasn't even been peer-reviewed yet, but so far it doesn't seem to be wrong.

But it seems possible to increase the residence time of particles in the atmosphere, because they are levitated.

By moving matter from the stratosphere to the mesosphere, we could, in principle, solve the problem of the ozone layer.

Other problems will arise

Ultimately, I think we can focus the particles only at the poles and apply climate engineering with a focus on the poles.

That allows us to do as much as possible to cool the polar regions of the earth in times of crisis, so to speak, with the least negative impact on the middle regions of the planet where we live.

This new idea is probably, in essence, a smarter idea than spraying sulfuric acid.

Whether or not this is true, I'm pretty sure that over time we'll probably come up with better ideas than just spraying sulfuric acid.

If engineers and scientists were to take this idea seriously, the impact on the planet would be enormous.

And I'll add that this idea has a huge impact on us.

Whether we accept it or not, the advancement of this advanced science and engineering will enable us to actively influence, control the planet, manage its weather and climate, not because we intended or wanted it to, but because science is advancing incrementally, gaining a more systematic knowledge of what is happening, and improving the tools that enable us to do so.

Now, let's say aliens come to Earth.

They'll land right there at the United Nations Headquarters, or they'll look for a better place, and they'll come and hand you a box.

The box has two knobs

One is a knob for controlling the temperature of the earth

The other is a knob that controls the CO2 concentration

It is expected that there will be a war over that box.

Because we don't have the means to agree on how to adjust the knobs.

We don't have that kind of global governance framework.

Everyone has their own ideas about knob placement.

Such a case is not possible at this time, it is impossible.

But we are building such a box.

Scientists and engineers around the world make them in their own laboratories.

the purpose may be different

They may believe it's for the sake of the environment.

Even if you're not interested in the bizarre idea of ​​global control,

The science they develop makes it easier to control.

I don't really want to do it, but I think we need to actively discuss this topic and take it seriously.

Sooner or later, the time will come when you'll be forced to make these decisions, even if the more you think about it, the better, and why you shouldn't do it.

Let me give you two ways to think about this problem.

But it's not just a few freaks like me who think

It means that we need to have a conversation that includes a wide range of fields.

A debate among musicians, scientists, philosophers and writers, people who are serious about the problem of climate engineering and what it can bring.

Now, one way of thinking about it is that it's just an alternative to reducing CO2 emissions, because it's cheap.

I didn't say it, but it's ridiculously cheap.

Whether it's sulfuric acid spraying or the method I'm thinking of, you can create an ice age at a cost of 0.001 percent of GDP.

It's very cheap and the benefits are great

It's not a great idea, but it's important.

There's not much room for discussion about the calculations.

It's debatable whether it's healthy or not, but the impact is real (Laughter).

no one will take it seriously

Because in this scenario, we're getting further and further away from our current climate.

Atmospheric CO2 levels also contribute to other problems, such as ocean acidification.

No one, except a few freaks, will say, "Let's try it."

But in the next scenario, denial becomes difficult.

If we don't do geoengineering, if we really want to reduce our emissions, and we do what we need to do.

But I don't know how much pace to reduce

There's a lot we don't know at what point in climate change is dangerous.

So let's say we get it right, and not just slam the brakes lightly, but slam the brakes hard, drastically reducing our carbon footprint and ultimately reducing our concentrations.

And then someday, say, October 23, 2075, we'll have the glorious day when concentrations finally reach their peak and then go downhill.

We celebrate on a global scale, but the reality is that the worst thing that has ever happened is happening.

Maybe that day we'll see the Greenland ice sheet melt at an unbelievable rate, so fast that over the next 100 years, sea levels will rise many feet and many large cities will disappear from maps.

this is totally possible

Even though geoengineering is uncertain and morally unsound, you might decide that it's better than no geoengineering.

And looking at the problem from another angle

It's about using it for risk management, not as a substitute for action.

It's geoengineering for a little while to avoid the worst warming, and it's not an alternative to reducing emissions.

But there's a problem with that view.

The problem is that knowing geoengineering may undermine the horrors of climate change and undermine today's efforts to reduce carbon emissions.

It's moral hazard in economics.

This is one of the fundamental reasons why it's so hard to talk about geoengineering, and another reason is that it's a political taboo to talk about it.

But you can't make good policy if you keep the problem hidden.

I would like to share with you three questions and one quote.

Should I seriously do research on this topic?

Should there be an international research institute on this topic?

We study not only how to improve, but also all the risks and downsides.

Right now, there are a few positives and negatives who are fervently arguing about it, but it's a dangerous state of affairs because so little is known about the topic.

With a small subsidy, you can gain some knowledge.

a lot of people or i think i should study it

i have big concerns

It's basically a matter of moral hazard, and I don't know the best way to avoid it.

The problem is serious, when people start talking about this, they think they don't need to be serious about reducing emissions.

The other is that perhaps we need a treaty.

It's a treaty that sets out who takes action.

Now it's easy to think of a big, rich country like the United States.

But if in 2030 China realizes it can't let its climate impact go unnoticed, it may ignore our moral arguments about how to deal with it and choose to geoengineer it.

And the world doesn't have an international framework for reaching decisions.

And finally, the US Academy's report from 25 years ago is a lot better than what I gave you today.

I think it represents our position.

The problem of CO2 and climate change as we know it is giving rise to many innovations, including innovations in energy technology to reduce CO2 emissions, but at the same time, I think we're going to have to look at the idea of ​​controlling climate and weather.

It's time to think about this, whether you like it or not, even if it's just to discuss why you shouldn't.

thank you

The economic boom of the last few years -- which has resulted in tremendous urban growth -- has also led to a dramatic donutization, and consequently slums, of cities that have exploded around the world.

With powerful wealthy neighborhoods surrounded by poor neighborhoods, creating a polarized environment and socio-economic inequality is central to the urban crisis.

But tonight, I'm going to start by telling you that the urban crisis goes beyond economics and the environment.

In particular, the cultural crisis -- the inability to rethink the stupid ways in which we magnify ourselves -- the institutional crisis -- the inability to challenge our appetite for oil and challenge the selfish urbanization that perpetuates cities on the premise of consumption, from Southern California to New York to Dubai.

So I want to share with you that the future of our cities today depends on reducing our reliance on buildings and, rather, on fundamentally restructuring our socio-economic relationships -- and that the best ideas for planning the cities of the future will not come from the wealthy and wealthy minority -- but from areas of conflict and poverty -- where the imagination that unfolds before our eyes will give us the opportunity to rethink today's urban growth.

To illustrate my thinking -- to help you understand, intrigue, and spark your imagination about conflict areas -- let me briefly introduce you to the Tijuana-San Diego border region, which has been a testing ground for rethinking my work as an architect.

This is a wall, a border wall that separates San Diego from Tijuana, Latin America from the United States. It's a physical symbol of the exclusion program - perpetuating the division of community, justice and resources in human society.

In this border region, we can see some of the most opulent real estate found on the fringes of San Diego, just 20 minutes away from some of the poorest neighborhoods in Latin America.

These two cities have the same population, but San Diego has grown six times more than Tijuana in recent decades, and we're quickly confronted with tensions and conflicts between sprawl and overcrowding.

I've spent the last few years arguing that the slums of Tijuana can teach us a lot about the socioeconomic sustainability of San Diego's sprawl, and that we need to look at and learn from the many immigrant communities on both sides of the border in order to understand the informal processes by which immigrant communities are urbanizing.

What is the meaning of informal in this case?

What I'm thinking of here is a list of social habits that many immigrant communities can adapt to by breaking through the walls of the political and economic agendas that are imposed on them in the face of urbanization.

What I'm thinking about is simply grassroots creative wisdom, the wisdom that has emerged in building the slums of Tijuana out of San Diego's waste, and the wisdom that has emerged in the immigrant communities of Southern California over the past few decades to keep pace with change.

As an artist, I've been interested in measuring and observing the many unofficial flows that transcend borders. One direction is from the south to the north, the immigration flow into the United States.

Now, let me introduce you to the recycling of old post-war single-story buildings, where American builders over the past few decades have expanded their suburban areas to the point of scrapping old homes that Mexican businesses have transported to border areas.

A house waiting to cross the border

It's not just people who cross borders, it's whole towns moving to neighboring countries. These houses are placed on top of steel towers, where the former ground floor becomes a second floor, and underneath that there's another house, a little shop.

This spatial and economic stratification is very interesting.

Not just houses, but small pieces of waste are being transported from San Diego to Tijuana.

I'm sure many of you have seen used tires used to maintain walls in slums.

But look what people have done here out of socioeconomic necessity.

They figured out how to strip the tires, cut them into strips and splice them together to maintain the walls more efficiently.

Garage doors, brought in from San Diego by truck, form the new exterior walls of emergency housing in many of these slums that surround Tijuana.

As an architect, seeing this kind of creative wisdom is very inspiring, but at the same time, I try to keep myself in check.

I don't want to glorify poverty

I just want to argue that this informal urbanization should not remain a dangerous image, but rather that informality and informality here is a set of socio-economic and political procedures that we, as artists, should embrace, and that it functions as grassroots urbanization.

The building doesn't matter here, it's just the appearance, it's really about what the building can do.

Buildings transform over time and play a real role in how communities come to terms with space, boundaries and resources.

As garbage moved south and people moved north in search of money, my research primarily had to examine the impact of immigration in the transformation of homogeneity in many parts of the United States, particularly San Diego.

As my research progressed, I began to realize that the key to Southern California's future was to rework its massive -- and extreme -- urbanization through small social and economic programs.

When immigrants arrived in these areas, they transformed the otherwise unremarkable land and buildings into complex social and economic systems, such as connecting the informal economy with garages, or illegally building grandma's outbuildings to support extended families.

Grassroots socioeconomic entrepreneurship in these regions is beginning to point to new, inclusive, and more equitable interpretations of land use.

There are many stories that arise from the dynamics of spatial transformation, such as the informal Buddha House, the story of the tiny house that saved itself and was never transported to Mexico, but ultimately settled as a Buddhist temple, and in doing so, the tiny house transformed and transformed, transforming from a quaint dwelling into a small, tiny, socio-economic and cultural infrastructure in a community.

As I've said, these local activities are very inspiring for thinking about new interpretations of citizenship, which is less about belonging to a civil state than about sublimating civic opinion into a creative activity that reshapes the institutional rules of urban space.

In fact, as an artist, I'm interested in the visualization of civil rights, collecting many anecdotes and anecdotes to explain the relationship between social processes and space.

This is the story of a group of teenagers who one night a few months ago thought of using the space under the highway to start building a skateboard park.

They took a shovel and started digging

Two weeks later the police stopped them.

The police cordoned off the place and the teenagers were kicked out, so they responded not with bank cards or slogans, but with the necessary administrative procedures.

The first thing they did was discover the peculiarities of political jurisdiction carved into the open space.

They realized they were lucky they hadn't started digging under the Caltrans area.

Caltrans is a state agency that has jurisdiction over highways, so it was very difficult to negotiate with them.

They say they were lucky to dig under the sleeve of a highway belonging to a municipality.

They also said they were lucky to start digging places like the Bermuda Triangle under the jurisdiction of port authorities, aviation authorities, two cities and review boards.

Every red boundary line was an invisible political organization carved into a vacant lot.

Teenagers found out about this and filed a complaint with the city as skaters.

they visited the office of the city's legal representative

City agents told them they needed to become an NGO in order to continue negotiations, and of course the boys didn't know what an NGO was.

The boys consulted a friend in Seattle who had a similar experience.

And then I learned that I needed to get more organized, raise money, create a budget, and have all the knowledge written in San Diego's local ordinances so that they could begin to expand and redefine what it means to be a public space in the city.

Ultimately, the boys were able to present these pieces of evidence, win the case, and build a skate park under the highway.

To many of you, this story may seem trivial and naive.

For me, as an architect, this is a very important story, because what I began to learn was that this small organization not only designed another category of public space, but it also designed the socio-economic procedures needed to sustain that space.

And what we've learned from this case is that, as we've seen in immigrant communities on both sides of the border, the conflict itself was the catalyst that had to be created from the very procedures that allowed us to reorganize the resources and policies of the city.

It's a campaign where cases that stem from informal, grassroots violations and are siphoned off lead to changing the very rules of the top-down.

And this journey from grassroots to top down is the hope that I found today.

I think about how modest changes in space and regulation are happening in many cities around the world, especially as communities, in areas of great urgency, redefining how we govern, social organization and infrastructure, and using our collective imagination.

In fact, it's a framework for creating new social and economic justice in cities.

I want to stress this point because I think this is the only way that we can move from being a consumer city to being a productive region.

thank you

Today you will see the production process of the work

All of my works are still in the process of materialization, and I still rely on my intuition and grope around to create them.

What I'm going to talk about now is the experience that we're exploring through our work.

The first work is "Imperial Monochrome".

The audience walks into the room without knowing anything, and sees panels randomly placed on the wall.

However, the panels soon begin to fluctuate and align themselves symmetrically, as if they've noticed the presence of the audience.

(Laughter) Here's a sketch of both states.

One is disjointed, the other is in perfect order

What's interesting is that very little change can lead to either state.

What you're associated with here are two very different styles of painting.

One is a 15th-century altarpiece -- the other is Malevich's abstract painting from about 100 years ago.

To give you a sense of scale

I prepared a video The height of the large panel is about 2m —

The smallest is A4 size

When the audience enters the exhibition room, the panels line up in no time.

After the audience has been there for a while, the panels become accustomed to the presence of the audience, and all of them become sloppy and loose.

(Laughter) It's almost as if the audience is giving the panel tension.

This was followed by a much smaller piece -- "Handheld."

What the spectator sees is a piece of paper on the wall, but as they get closer, they see a piece of white paper, A4 or letter size, held by two little hands on either side.

Also, the viewer notices that the whole piece moves slightly, almost as if two hands were holding the paper still, holding it still, until it finally became unbearable.

This erratic motion is very similar to the erratic image seen through a handheld camera.

Please compare the two images

One was taken with a fixed camera - the other with a handheld camera.

As you've probably noticed, unstable footage reveals the subjective point of view of the photographer.

So we didn't let the camera go through, but made the paper move erratically.

watch the video

imagine the other hand

With this, I'm trying to convey a sense of shyness, as if there's a dwarf with outstretched arms behind a giant sheet of paper.

And this movement also shows the tension, because I'm trying to help the viewer, and I'm trying to quietly show this piece of paper to the audience in front of me.

Next is "Decoy"

This is a model, but it's about the same height as me.

It has a round body, two arms, and a long antenna that you can see on its head.

So when a spectator walks by, they sway from side to side, and they wave their arms more and more violently as the person approaches them.

This is the first working test

The body and arms begin to move together, and it looks like the object is using its whole body to appeal desperately.

But once they get your attention, they lose interest and look for someone else.

(Laughter) Here's what the finished decoy looks like.

It's like a mass-produced product that comes from a factory — like a vacuum cleaner or a washing machine.

We always start from the personal realm.

This is a little malicious, because it tries to distract us from the things we need to pay attention to, but we also need a lot of help.

My next work is both an object and an instrument.

The size of this amphitheater is adapted to the size of the audience as seen from above the stage.

From where I'm standing, you're about this size, and my field of vision is full of the crowd.

996 dolls sit on the seats

Each puppet is designed to clap at will.

So it's up to each of us to decide whether to clap, when to clap, how hard to clap, how long to clap, whether to follow others, to influence, to participate in new clap.

When the people who came to see it were in front of the crowd, they responded.

The applause can be sparse or loud, but after that nothing happens.When the spectator leaves the stage, the crowd reacts again.

Sometimes it's just a few people clapping, sometimes it's a big round of applause.

And then we see the whole audience as an object, a living creature, and the audience also has a musical component, an instrument.

The audience can elicit very complex, diverse, and subtle sonic patterns, but they can't elicit the desired response from the audience.

A feeling of being evaluated, a feeling of whimsy — and anxiety.

It's both charming and trapping.

I'm excited about the image of the head splitting into two and becoming two hands.

Here's what it looks like when it's finished. It's as if the left and right hemispheres of the brain are colliding to understand duality and tension.

here is the prototype

I want to be surrounded by 996 bodies as soon as possible

So next is my final piece, "Frame Runner."

The inspiration came from windows

This is the actual window in the studio.

Based on the same structure as this window, I made the original frame and hung it in the room so that it could be seen from both sides.

Inside this frame lives a family of little dolls.

This family also comes in three different sizes, and they seem to represent perspective and landscape even though they're on one plane.

Each doll can move back and forth on the frame and hide in the middle.

In contrast to the very rigid frame, the puppets were intended for slapstick, comical movements, as if they were being held and manipulated by a puppeteer.

We love this idea: the dolls don't care, they're carefree, they're skipping carefree, but as soon as they sense someone in the audience -- they hide behind the nearest wall.

There are contradictions in this work

The dolls are imprisoned in a rigid frame, like a prison, but it's also a fortress, because the frame allows them to be worry-free and purely oblivious to the outside world.

It looks like a living creature, but its properties are represented by a special mechanism. We were lucky enough to have the cooperation of ETH Zurich during the prototype stage.

After watching the animation, they created a mechanism that combined head bobbing and back-and-forth movements to create subtle movements.

It's so small it fits in the palm of your hand

It's so small it fits in the palm of your hand

I was so excited to see it in action in my studio.

(laughs) Thank you very much.

(applause)

What is intelligence?

If you look back at the history of the debate about intelligence, it hits upon Edgar Dijkstra's famous quote, "The question of whether machines can think is as interesting as the question of whether submarines can swim."

This quote by Edgar Dijkstra comes from a critique of Alan Turing and other computer science pioneers. It comes from a criticism of computer science pioneers.

But when you think about it--but when you think about it--we could make machines that swim and machines that fly--we could make machines that swim and machines that fly--what is the biggest driving force? What is the biggest driving force? By simply understanding the physics of swimming and flight, by simply understanding the physics of swimming and flight, we were able to build machines like this.

A few years ago, a study I did -- a few years ago, a study I did -- was trying to figure out the physical fundamentals of intelligence.

Before that, I want to do a thought experiment.

Before that, I want to do a thought experiment.

Think of yourself as an alien who knows nothing about the Earth.I don't know anything about biology, neurology, intelligence.But suppose you can observe the Earth with a good telescope, but you can observe the Earth with a good telescope. will

and you'll see something different

If you look at it for a thousand years, you see that the Earth is constantly being hit by meteorites. It can change course or explode.

Earthlings, of course, know that the reason is that they are trying to protect themselves -- of course, Earthlings know that the reason is that they are trying to protect themselves.

I'm trying to avoid conflict

But you, the alien, don't know that, you don't even think about the existence of intelligent life on Earth, and you have to think of physical theories about why meteorites don't hit the earth at some point -- why do meteorites stop hitting the earth at some point -- and you have to think of physical theories.

This is the same problem as understanding the physical nature of intelligence.This is the same problem as understanding the physical nature of intelligence.

So in the research I did a few years ago, I looked at many areas of science that point to unifying principles of intelligence.

So in cosmology, for example, there's a lot of evidence, and there's a lot of evidence that this universe is intelligent, that this universe is intelligent, and that this universe is well-coordinated, especially to maximize the future diversity of the universe.

Take the game Go, for example. Everyone remembers IBM's Deep Blue defeating Kasparov in 1997 at chess, but what's not so well known is that in the last decade, a game with a very high branching factor and much harder than chess. Right now, the best thing for computers to do is to maximize their future options, to maximize their future options.

As a final example, in robot motion programming, to accomplish complex tasks -- to accomplish complex tasks -- there are state-of-the-art techniques that seek to use the ability to maximize freedom of movement.

For several years now, I've been asking this question: does the integration of different disciplines reveal the principles behind intelligence? Will we see the principles behind intelligence? Will we see the principles behind intelligence? Will we see the principles behind intelligence?

Is there a uniform formula?

My answer is yes [F = T ∇ Sτ] Much like E = mc² but this is the intelligence formula Much like E = mc² but this is the intelligence formula Much like E = mc² but this is the intelligence formula

What each of them represents is F is intelligence, the power to maximize future freedom F is intelligence, the power to maximize future freedom

What works in maximizing the degree of freedom of the future and expanding the options is the intensity T, and by a certain time tau T, the intensity T, and by a certain time tau The diversity of the achievable future is S. The diversity of the achievable future is S.

The point is that intelligence doesn't like to sit still.

Intelligence maximizes future freedom and continues to expand options Intelligence maximizes future freedom and continues to expand options

But a natural question arises: How do we use this formula? What can we predict?

How do we use this formula? What can we predict?

human intelligence level? Predicting the progress of artificial intelligence?

human intelligence level? Predicting the progress of artificial intelligence?

I'm going to show you a video. I'm going to show you a video.

According to the latest research in cosmology, the "entropy," or disorder-increasing universe -- the "entropy," or disorder-increasing universe -- is oriented toward the optimal conditions for intelligent life to exist.

But what if, in a cosmological sense, between entropy and intelligence, but in a cosmological sense, between entropy and intelligence, on a deeper level?

What if intellectual behavior is not only related to long-term increases in entropy, but what if intelligent behavior is not only related to long-term increases in entropy, but stems from entropy itself?

To find that out, we developed a software called Entropica.

Amazingly, Entropica could pass various animal intelligence tests, play human-like games, pass various animal intelligence tests, play human-like games, and even trade stocks without being directed.

See Entropica in action

It walks upright like a human on two legs without falling over, and as you can see, it uses a cart to try to balance the pole.It uses the cart to try to balance the pole.

One of the things that's surprising is that you don't give entropica a purpose, but it behaves like this.

Use your own judgment and balance the pole

These capabilities can be applied to humanoids and assistive technologies for people with disabilities These capabilities can be applied to humanoids and assistive technologies for people with disabilities These capabilities can be applied to humanoids and assistive technologies for people with disabilities.

Some animals use tools out of reach, some animals use tools out of reach, some animals use tools out of reach. release from the position of

The ability to use these tools can be applied to manufacturing and agriculture.The ability to use these tools can be applied to manufacturing and agriculture.

And some animals work together to pull on the end of the rope to get food, and some animals work together to pull on the end of the rope to get food, and some animals work together to pull on the end of the rope to get food.

This ability to cooperate can be applied to many areas, such as economic planning.This ability to cooperate can be applied to many areas, such as economic planning.

Entropica can be widely applied in many fields Entropica can be widely applied in many fields

For example, the game of Pong, which is being played successfully by itself.

And in social networks that are constantly losing touch, and in social networks that are always losing touch, Entropica is good at building new relationships Entropica is good at building new relationships.

The organizational capabilities of this network can also be applied to health care and energy intelligence.

A fleet of ships discovering the Panama Canal A fleet of ships discovering the Panama Canal and expanding from the Atlantic Ocean to the Pacific Ocean and expanding from the Atlantic Ocean to the Pacific Ocean.

Entropica can be applied to self-defense, logistics, transportation, etc. Entropica can be applied to self-defense, logistics, transportation, etc. Entropica can be applied to self-defense, logistics, transportation, etc.

The last example is the strategy of buying low and selling high in stock trading. The last example is the strategy of buying low and selling high in stock trading.

These risk management skills have broad application in economics and insurance These risk management skills have broad application in economics and insurance These risk management skills have broad application in economics and insurance

So far, we've seen intelligent cognitive behavior in humans. So far we've seen intelligent cognitive behavior in humans. So far we've seen intelligent cognitive behavior in humans.

It is very ironic here that

In the play "RUR," which was the first play to use the word "robot," the play "RUR," which was the first to use the word "robot," had the concept that "If you build an intelligent machine, there will be a robot rebellion."

Machines will turn against us and rise up.

A major result of our research in recent decades has been the exact opposite of robot insurgencies.

It's not about any intelligent machine trying to rule the world out of megalomania.

Quite the opposite - the natural principle that controls all future possibilities - the natural principle that controls all future possibilities - is more basic than intelligence, more basic than intelligence, and it is the natural principle that tries to control possibility that causes intelligence, and not the other way around.

Another important result is Goal Seek

I'm often asked, how does our ability to find goals follow this principle?

The answer is, the ability to seek goals is directly related to: To achieve a variety of objectives -- to achieve a variety of objectives -- to overcome obstacles that lie ahead -- to grow wealth over the long term -- to grow wealth over the long term -- even if you're short term, invest in financial security -- even if you're short term short term, invest in financial security -- Goal Seeking is your future behavior. increases freedom of action - goal-seeking increases freedom of future actions - arises directly from long-term motivation

Finally, the famous physicist Richard Feynman said, "If human civilization were to perish, and if we could only pass on one concept to our descendants to rebuild our civilization, to rebuild our civilization, if we could pass only one concept to our descendants, to rebuild our civilization, if we could pass only one concept to our descendants, ``Everything around us is made of tiny atoms.''Everything around us is made of tiny atoms. It is the concept of “When you are apart, you are attracted, but when you are attached, you are separated”.

My interpretation of this -- my interpretation of this -- helps build artificial intelligence and understand human intelligence -- helps build artificial intelligence and understand human intelligence -- something like this: Intelligence should be a physical process that maximizes future degrees of freedom -- intelligence should be a physical process that maximizes future degrees of freedom -- and it should be a physical process that eliminates limitations.

thank you

(applause)

I'd like to start with the story of the "Paisley Snail Case." I want to start with the story of the "Paisley Snail Case."

Evening of August 26, 1928 -- Mae Donahue of Paisley, about 11 kilometers east of Glasgow, visited by train May Donahue, of Paisley, about 11 kilometers east of Glasgow, visited by train from Glasgow, had a ginger beer float, a mixture of ice cream and ginger beer as a treat from a friend. ate

A dark opaque bottle of ginger beer was labeled "D. Stevenson, Glen Lane, Paisley."

She proceeded to eat the float and poured the rest of the ginger beer into a tumbler.

Three days after that, she was admitted to Glasgow Royal Infirmary, and three days later she was admitted to Glasgow Royal Infirmary, diagnosed with acute gastroenteritis and shock.

The Donahue v. Stevenson lawsuit, which was later filed, set an important precedent, and the ruling was as follows: Mr. Stevenson, the brewer, owed Mrs. Donahue a clear duty of care -- even though there was no contractual relationship, and by extension, even if the lady herself did not purchase the beverage.

One of the judges, Lord Atkin, said, "Any act or omission that is reasonably foreseeable and reasonably foreseeable to harm your neighbor must be avoided."

In fact, without a duty of care, before Stevenson went out of business, in fact, without a duty of care, how many people would have had to suffer from gastroenteritis before Stevenson went out of business?

So keep this story in mind, because it's an important principle.

Last year, the Hansard Society, a bipartisan charity that strives to strengthen parliamentary democracy and promote public political engagement, published its Annual Audit of Political Engagement report with an additional chapter focusing exclusively on "Politics and Media."

The survey has a slightly depressing view The survey has a slightly depressing view

Tabloids seem to have no power to advance the political citizenship of their readers, even compared to people who don't read newspapers at all, even compared to people who don't read newspapers at all.

People who read only tabloids are twice as likely to agree with a pessimistic view of politics as those who read nothing at all.

It's not that those readers are less interested in politics.

Because those readers are consuming the media with a pessimistic view of politics, they become fatalistic and cynical about democracy itself and their own role in it.

So it's little wonder that this study concludes, "Newspapers, especially tabloids, don't seem to play the important role that the media should play in democracy."

So, is there anyone in the audience who would seriously challenge this view?

But if Hansard is right -- and most of the time he's right -- we have a very serious problem, and I want to spend the next 10 minutes focusing on this problem.

Since the "Paisley Snail Affair," especially in the last decade or so, since the "Paisley Snail Affair," especially in the last decade or so, so many ideas have emerged about the concept of duty of care as it relates to many aspects of civil society.

In general, a duty of care arises when an individual or group of individuals engages in behavior that is likely to cause physical, psychological or economic harm to another person.

And it's largely limited to areas where the reasons are obvious, like children, young people, people in military service -- empathic responses to the elderly and the vulnerable.

Rarely does the concept extend to a discussion that is as important as the fragility of the current political system, or the idea that honesty, accuracy and fairness are fundamental to the process of building and embedding an informed and participatory democracy.

The more I think about it, the more I wonder The more I think about it, the more I wonder

A few years ago we opened a new school in the North East of England A few years ago we opened a new school in the North East of England A few years ago we opened a new school in the North East of England

Students renamed the school Academy 360

As I walked through the majestic entrance hall with the glass ceiling As I walked through the majestic entrance hall with the glass ceiling On the front wall, flashed in flame letters On the front wall, flashed in flame letters, was a quote by Marcus Aurelius "If it's not true, don't do it. If it's not true, don't do it."

The vice-principal noticed me staring at it and said, "It's an educational philosophy."

The quote stuck in my head on the train ride home to London.

I kept wondering if it really took more than 2,000 years for such a simple idea to become the bare minimum of what we expected of each other.

I wonder if now is the time to develop the concept of duty of care and expand it to include consideration of our shared but increasingly endangered democratic values.

After all, the lack of care in many professions is so readily blamed on negligence, so how can you be complacent about the idea that you're effectively overlooking the health of society and the values ​​that naturally underpin it?

So is there anyone who can honestly say, based on evidence, that the media Hansard has so vehemently condemned are taking great care to avoid any reasonably foreseeable act that could hurt or even damage our inherently fragile democratic society?

And I'm sure there are people who would argue, "We could fall into censorship in the form of self-censorship," and "We could fall into censorship in the form of self-censorship," and I don't think so.

It should be possible to balance freedom of expression with broader moral and social responsibility.

Let me explain why, using my experience as a filmmaker Let me explain why, using my experience as a filmmaker

In my career, I've never embraced the notion that, "A filmmaker should focus on his work, on his life, his family -- the future of the society in which he lives, and not on the values ​​that matter."

It doesn't stop there

It's our responsibility as filmmakers not to degrade our work to the point where it's less than the world we want to live in.

I think filmmakers, journalists, even bloggers need to face society's expectations when it comes to combining the intrinsic power of the media with their honed expertise.

It's not a mandatory obligation, of course, but I think it's something that a good filmmaker or a credible journalist -- even a blogger -- can't avoid entirely.

We should bear in mind that the notions of individual liberty, of fellowship, of creative liberty are relatively new in the history of Western thought, relatively new in the history of Western thought, and therefore susceptible to neglect and can be undermined very quickly.

It's a fragile and precious thing, and once lost or abandoned, it's very difficult to get it back.

And the first line of defense must be a moral code, not one imposed by censorship or legislation, but a code of morality and integrity.

Honesty in working with others, honesty in working with others, and a moral code that works in society.

These norms must be aligned with the challenges of a sustainable society.

It's one of the elements of collective responsibility. The responsibility of artists and journalists to cover the real world -- the responsibility of artists and journalists to cover the real world -- must also go hand-in-hand with the responsibility, on the part of governing, to look at the world squarely and not give in to the temptations of injustice that can be a nuisance.

But as has been prominently shown in the last few years, much of that responsibility has been dismissed in most media.

As a result, across the Western world, the oversimplified policies of protest groups have been embraced primarily by disenchanted older demographics, or, as typical of at least some young people, political indifference and trivial preoccupation.

A fervent libertarian might argue that Donahue v. Stevenson should have been dismissed, and eventually Stevenson would have gone out of business if he had continued to sell ginger beer laced with snails.

But most people accept a small role in fulfilling their duty of care, and the key word is rationality.

The judge must ask whether due care was exercised, whether the consequences of the conduct were reasonably foreseeable, whether the consequences of the conduct were reasonably foreseeable.

Far from demonstrating coercive state power, it's a small common sense test of rationality that, after all, should be applied to the media that shape most democratic discourse and content.

For a democracy to work, sensible men and women need to spend time understanding and discussing difficult and sometimes complex issues, and they need an atmosphere that seeks to reach a compromise that is at least valid and workable, if not consensus.

Politics is a choice, and the priority among the choices is politics.

It seeks unity from conflicting orientations wherever and whenever possible, based on facts as much as possible.

But if the facts themselves are distorted, the solution will only create more conflict, with the social stresses and strains it entails.

The media must decide whether to promote their role or to spread information.

Because in the end it's a combination of trust and guidance, because in the end it's a combination of trust and guidance.

Fifty years ago this week, President John F. Kennedy gave two landmark speeches on disarmament and civil rights.

The first speech quickly led to the Partial Test Ban Treaty, the second to the Civil Rights Act of 1964, and both represented breakthroughs.

A well-guided and informed democracy can achieve great things, but there are prerequisites.

We must believe that those decisions act in everyone's best interests, not their own.

We need factual and well-crafted options, not some powerful and potentially manipulative corporate options that tend to want a narrow agenda.

If you want your descendants to have a decent and fulfilling life, if you want your descendants to have a decent and fulfilling life, you need to exercise the care of a vibrant and hopefully permanent democracy to the greatest extent possible.

Thank you for your attention

(applause)

What is "love"?

Love is so broad that it's hard to define, isn't it?

i love jogging

i love reading and movies

I love pork cutlets

because i can say i love my wife

(Laughter) But there's a huge difference between pork cutlets and my wife.

I love pork cutlets, but pork cutlets don't answer my questions.

On the other hand, my wife says I'm her star.

(Laughter) So, it's only when someone wants me - that I can become a desirable person.

This allows us to define love more precisely, and say that it is the desire to be desired.

The never-ending question of love is, "How can I be desired and keep it?"

As individuals, we've tried to solve this problem by conforming to society's rules.

There are roles to be played according to gender, age, and social status, and only by playing those roles can we be recognized and loved by society as a whole.

Young women should remain chaste until marriage

The youngest of the siblings should obey the eldest son, and the eldest son should obey the patriarch.

But a phenomenon that began in the 13th century, mainly during the Renaissance, in the West, led to the greatest identity crisis in human history.

modernization

Modernization can be summed up in three streams.

First, the flow of rationalization brought about by scientific research, which drives innovation.

Then, in the flow of political democratization, the concept of "individual rights" spread.

And finally, the flow of rationalization through economic production and free trade.

The combination of these three things destroyed all the traditional ways of being in the Western world, with radical consequences for the individual.

Today, we are free to evaluate or disparage someone's attitudes, choices, objects, etc.

But the result is that everyone is judged by the same evaluation that others have around them.

So my worth was once secured by devoting myself to traditional authority.

now priced like the stock market

We measure our worth every day in the free market of individual desires.

So modern people are tormented by this anxiety.

"Am I wanted? How?

How many people will love me? ”

How can we deal with this kind of anxiety?

Do you get random symbols of desirability?

(Laughter) I call it collecting, and there's another capital called seduction.

In fact, today's consumer society is deeply rooted in seduction capital.

This form of consumption is now called materialism.

But not true! I buy things only to socialize with other people.

to seduce you to love yourself

Aside from materialism, the sentimental thing is that a teenager buys a new pair of jeans and rips them at the knees to please the popular Jennifer. (Laughter)

(Laughter) Consumerism is different from materialism.

Rather, it is swallowed up by materialism, sacrificed in the name of the god of love and the capital of seduction.

If we think of modern love this way, how should we think of love in the future?

I can make two assumptions: first, that narcissistic capitalism will become even stronger.

However, it is difficult to say how it will become stronger because it depends heavily on social and technological innovations, which are difficult to predict.

But for example, think of a dating site, isn't it similar to a point service at a store? You get points for seduction capital: age, height, weight, academic degree, annual income, number of profile views, and so on.

In the future, we may even see chemotherapy for broken hearts, a drug that calms the feeling of longing for love.

By the way, on MTV's reality show, the masters of seduction treat love woes like a disease.

We call ourselves “pick-up artists”

"Artist" is an artist as you can understand in French

"Pick-up" is to pick someone up, especially a young woman.

That's why I'm a master at picking up young women.

(Laughter) Masters call love woes "one-itis."

In English, "itis" is an inflammation that occurs in a part of the body.

"One-itis" means "an unrequited unrequited love of one person."

It's kind of terrible, isn't it? Indeed, for a pick-up master, falling in love is a waste of time and a waste of seduction capital, and should be eliminated like a disease or an epidemic.

Another possibility is to use genetic information in romantic relationships.

By carrying it around like a business card and presenting it, you can check whether the encounter between the two will develop into childbirth.

(Laughter) Of course, this kind of love competition, like any other intense competition, creates a huge barrier to narcissistic satisfaction, so loneliness and conflict are also prominent.

Maybe we should question modernity itself, the origin of the capital of seduction.

But I'm particularly concerned about the reaction of neo-Nazis and religious groups.

But there are ways to keep things out of the way

Because you can think of other ways about "love"

What kind of road is it?

How can I let go of the irrational desire to be evaluated?

It is to be conscious of your own "boringness"

(Laughter) Yes, I'm a boring person.

But don't worry, so do you.

(Laughter) (Applause) We're all useless.

It's easy to show 'boring' because to be valued you need to be wanted by others and you're not worthy of yourself.

I'm not born worthy

We all act like someone's star, but in reality, it's just a cover-up scam, like someone who pretends to be indifferent on the street, but who's cunning in his head, trying to get people's attention.

Perhaps it's the awareness of this routine fraud that we worry about that will bring light to the relationship.

I want to be loved from head to toe I want to be recognized for my choices That's why temptation is a nasty thing

So I want to look perfect in order to be loved by someone

I want them to be perfect so they can be confident in my worth

Couples caught up in acting break up with a little disappointment.

The opposite of this is kindness.I think "love" is "kindness."

What is "kindness"?

To be kind is to accept your loved one's weaknesses.

I'm not asking you to be a sad couple like your caregiver.

(Laughter) This is not good.

On the contrary, there is a lot of charm and happiness in kindness.

In particular, I want to emphasize a humor that, unfortunately, is not often used.

Shall I call it beauty woven by intentional clumsiness?

to ridicule oneself

For couples in crisis, where traditional conventions are no longer viable, I believe that self-mocking is the best way to sustain a long-term relationship.

First, imagine you're in a grocery store, and when you buy groceries, you're given a choice.

If you want to choose things that are good for the environment, which one is the right choice?

Many people will choose paper

well why

First of all, it's brown.

so it must be good for the environment

Biodegradable and reusable

Sometimes even recycling is possible

On the other hand, when you see a plastic bag, you think of something like this, which, as we all know, is terrifying, and you want to avoid this kind of environmental destruction at all costs.

But people usually don't think about things like this, which are on the other side of the spectrum.

Any production has to come from the environment, and inevitably has a huge impact on the environment.

What's happening now is that when we have to make complex choices, humans tend to prefer simple solutions, often looking for simple solutions.

I work in the design industry

I give designers and innovators advice on sustainability, and they always tell me, "Laylor, I just want green materials."

And I say, "It's not that simple." And we need to have four hours of intense discussion about what a real eco-material is.

You're going to have to rely on some kind of intuitive thinking when making decisions.

I like to call this intuitive thinking the "folk belief" of the environment.

It could be that little voice in your head, or it could be that feeling in your gut, like that feeling that you did the right thing in choosing a paper bag or buying a fuel-efficient car.

Environmental folk beliefs are very important because they're trying to do the right thing.

But how do we really know? How do we know whether our actions, both professional and private, and society, are ultimately reducing our impact on the natural environment?

The issue of folk belief in this environment is a subject that tends to be driven by experience.

not always based on a scientific point of view

It's very difficult because we live in a complex system.

First, there's the human system that we communicate with, the way we interact with each other, and the resulting society is also a system. Then there's the industrial system, the whole economy.

As you're aware, our choices are personal, but on the other hand, the choices we make affect all systems, no matter where you stand.

If we really want to pursue sustainability, the way we have to find ways to connect these complex systems is to make better choices that benefit the environment as a whole.

What is needed is learning to do big things with little effort.

The population is growing, and everyone loves mobile phones, especially in this situation.

So we need to find innovative solutions

This is where the process of lifecycle thinking comes into play.

Essentially, all things go through stages in their life cycle, and this scientific process, called life cycle assessment, or life cycle analysis in the United States, helps us get a clear picture of how what we do in the technical part of the system affects the natural environment.

So we can go all the way back to the extraction of raw materials, watch the manufacturing process, look at packaging and distribution, and even use and dispose of it, and monitor how we interact with the natural environment at every stage of our interaction, and how this interaction affects the systems and services that make life possible on Earth.

Thanks to that, I made a wonderful discovery.

I broke through some legends

Let's start with the familiar words first.

It's used a lot in marketing, and I think it's used in everyday conversation, too. When we talk about sustainability, we use the word biodegradable.

Biodegradability is a property of a material, not a definition of environmental benefits.

let me explain

A natural object, for example, is made of cellulose fibers, like a piece of bread, or a piece of garbage, or a piece of paper.

The stored carbon molecules are naturally released and returned to the atmosphere as carbon dioxide, but in principle,

Many natural substances do not return to nature in this way.

Most of the garbage we produce goes to landfills

A landfill is a completely different environment

In landfills, the same carbon molecule breaks down in a different way, because landfills are anaerobic.

no oxygen tightly packed and hot

So it's the same molecule, but it's methane, and methane can be 25 times more greenhouse gas than carbon dioxide.

Old lettuce and other biodegradable material that we throw away contributes to climate change when landfilled.

Now, as you know, we have facilities that actually take methane to generate electricity, and we can do away with fossil fuels, but we could be smarter.

If we start designing systems and services after identifying how we can take advantage of this type of thing that's already happening, we should be able to reduce the problem.

So what we're doing now is something like, "Let's ban plastic bags and switch to paper bags, because it's good for the environment."

But when you throw the bag in the trash and your local landfill is normal, you end up with what's called a double negative.

i am a product designer

studied social science

So I'm interested in consumer goods and how they fit in with us, how they permeate our lives, and how they affect our natural environment.

This is a serial killer.Everyone in this room must have a refrigerator.

America is gifted with the ability to keep making refrigerators bigger.

Over the last few years, the standard size of a refrigerator has increased by an average of 30 liters.

The problem here is that our refrigerators are so big that we end up buying more than we can eat or find.

There's something in the back of the fridge that you've forgotten for a long time, right?

so you waste more food

This garbage is a problem

In fact, here in the United States, 40 percent of the food we buy is wasted.

Half of the world's production is wasted

This is the latest statistics from the United Nations, half as much.

It's crazy, because we waste 1.3 billion tons of food a year.

I think refrigerators are to blame, especially in Western civilization, because it's so easy to waste them.

Things are actually more complicated

I don't want to oversimplify

But the refrigerator is a serious culprit, and another problem is the vegetable compartment.

Do you have a vegetable room?

Is that the drawer you keep the lettuce in?

If I put the lettuce here, won't it get watery?

hey? Is the lettuce watery?

That's the problem in the UK. A few years ago, a government report pointed out that soggy lettuce is the second most common food waste in the UK.

That's why it's called the "watery lettuce report."

May I? it's a big problem

The poor lettuce is discarded, left, right, center, because you can't actually keep food crisp in the vegetable compartment.

It is useless unless it is more airtight

The truth is that, for example, a vacuum is the only way to prevent spontaneous degeneration.

It's just a drawer, and it's a little airtight.

I'm sure I'm too picky

Don't show me a refrigerator with these functions.

anyway this is a big problem

When lettuce is lost from the system in this way, we must not forget the process of growing lettuce, not just the final stage of food waste that I just described.

The impact of the lettuce life cycle is astronomical

First, clear the land for the fields

You need to plant a seed in there, and you need phosphorus, fertilizer, nutrients, water, sunlight.

Everything the lettuce used to grow is lost from the system, and the environmental impact is far greater than the energy lost from the refrigerator.

So we have to better design these things to deal with serious environmental problems.

Let's start with the size of the vegetable compartment and refrigerator

Fridge designers here, please consider.

The problem is, for example -- imagine actually rethinking the design.

I've always seen refrigerators as symbols of modernity, but the design hasn't changed much since the 1950s.

It's a little bit different, but it's basically a big box -- something that's cold and stores things.

If you really want to rethink how you design, you can find problems and then develop innovative and elegant problem-solving designs.

This is design-driven system change. Design makes your system more sustainable.

40% food waste is a big problem

What if we could cut that in half by designing refrigerators?

The other thing I'm looking at is the electric kettle. I just noticed that we don't use electric kettles in this country, do we?

important in the UK

97% of British households own an electric kettle

very popular

When I work with design firms and designers, when it comes to developing an eco-friendly kettle, they ask me two things.

"Layla, how are you going to improve it technically?"

energy is clearly an issue

“How can we make it an eco product?

How can we manufacture with environmentally friendly materials? ”

How do you like it?

Makes sense, right?

But I would answer, "That's another matter."

I'm actually having trouble using it.

how to use this product

65% of Britons admit to filling the kettle with too much water for just one cup of tea.

The energy wasted in boiling this extra water is, according to the calculations, the energy required to boil an extra kettle of water in a day is equivalent to lighting street lamps all over England all night.

but it's true

Product - We call it human failure

These are the things that cause product-system failures, they're too familiar to you to notice.

But this man is aware, it's Simon.

Simon works for the UK National Electricity Company.

My job is to monitor electricity usage to make sure that the system can provide all the power it needs, so that electricity reaches every home.

I am also monitoring the TV.

The reason is that when a popular TV show ends

Because there is a phenomenon that is peculiar to Britain.

When it's commercial time, Simon has to rush to buy French nuclear power, because everyone's going to switch on the kettle all at once.

(Laughter) 1.5 million kettles. It's going to be a huge problem.

If you design a kettle, you're going to solve this system failure, because it puts a huge load on the system, and today's products don't think about it.

If you look at a number of kettles on the market, you'll find that the minimum water mark, which indicates how much water to fill, is engraved between 2 and 5.5 cups, even though you're just making a cup of tea.

This type of kettle is actually divided into two parts inside.

One is a kettle and the other is a jug tank.

The user just presses this button to boil the water.

This is a behavior change product, a product, a system, that solves the problem at hand.

Now let's move on to technology. It's a very popular product. But if we continue to design, buy, use and dispose of it as we are today, if we continue to design, buy, use and dispose of it, the amount will be astronomical. There are seven billion people in the world today.

As of last year, there were 6 billion mobile phone subscriptions.

1.5 billion mobile phones are produced each year, and according to some companies, that production rate is higher than the human birth rate.

In the United States, 152 million mobile phones were discarded last year, and only 11 percent were recycled.

I'm from Australia, population of 22 million -- don't laugh -- they say they have 22 million phones in their drawers.

I need to find a solution for this, because it's very complicated.

Because a lot of it is trapped inside the mobile phone.

It's gold! Did you know that it's actually cheaper to extract gold from an old phone than it is to refine ore?

There's a wealth of valuable compound substances in your phone, so you need to encourage it to break down, or this will happen.

This is a community in Ghana, e-waste, which is electronic waste, and they say they trade 50 million tonnes of it.

reported by the United Nations

This is how we extract gold and other valuable materials.

Here, in a vacant lot, e-waste is being burned.

Scenes like this can be seen all over the world

It's a result of the choices that we make as designers, as businesses, as consumers, because no one considers the ripple effects, so extremes like this happen and they end up in people's lives.

We have to find smarter, systems-based ways, and if we're going to pursue sustainability all over the world, we have to find innovative solutions.

When it comes to buying a mobile phone, by the way, old mobile phones -- on average every 15 to 18 months you get a new one -- it seems like a stopgap.

We have these phones in this room, and some of you will be making them, but I think you're looking at closed-loop systems -- product system services -- so that there's a market need, and we can make sure that it's not over-demanding.

Easy-to-disassemble design and weight reduction

It's the kind of strategy that actually works at Tesla Motors.

These approaches aren't difficult, but understanding the system and looking for realistic, market-driven, consumer-demanded alternatives is the starting point for a huge shift in sustainability planning. I'm sorry to say this, because consumption is the biggest problem.

design is one of the best solutions

These products are all around us.

By finding new solutions, you can actually start innovation, and that's the first time you can call it innovation.

I'm sure you're all very innovative.

But using sustainability as a parameter and a criterion to drive system-based solutions, the products I've just highlighted are addressing these critical issues.

We have to look at the life we ​​live in general.

Paper or plastic -- obviously reusable is more beneficial -- but paper is actually worse. Paper is worse because it's four to ten times heavier than plastic. So when you're comparing from a life cycle perspective, you're comparing per kilo. Paper is much better in this case.

So you'll need less plastic, and you'll need much more paper.

What it does will determine its impact on the environment. Designers ask me what eco materials are.

Few Substances You Should Avoid

Being eco-friendly depends on how you use materials, and after all, in the economy, designing, producing, and buying is all about functionality.

we buy because we want something

By pushing things to the limit and coming up with smart, elegant and sophisticated solutions, we can think of the whole system and find innovative solutions to everything, every step of the way, until the product does its job.

Now, I'd like to make one final point, one that I heard from a colleague, a senior designer.

"Why don't you pursue sustainability? You know that."

When I asked him about it, he confided that he had a customer suggest it to him, and he told me, "Costs will come down. Sales will go up. But we're not ahead of the curve. We're making too many sacrifices."

thank you

(applause)

The world is changing. It's a huge change. What's disturbing here is that investors aren't paying enough attention to the biggest forces driving this change.

Sustainability here means something that's economically viable -- things like environmental and social issues and corporate governance.

Ignoring this would be reckless, as it would jeopardize future long-term returns.

It may surprise you, but it's up to institutional and large investors -- pension schemes, foundations, endowments -- to wield the power to influence sustainability.

Investing in sustainability isn't as complicated as people think, it can yield incredible results, and it's more important than you can imagine.

remember this fact

The world's population is growing and aging, from 7 billion today to 10 billion by the end of the century. We are consuming more natural resources than we can regenerate. Greenhouse gas emissions, which are said to be the main cause of climate change, are also increasing.

These are indeed environmental and social issues, but they are not the only ones.

It's also an economic issue, which is why risk and return are involved.

It's so complicated, it seems so far away, and it's easy to put your head in the sand and pretend you haven't seen it.

But let's endure it as long as we can, no at home

(Laughter) Now, my question is, are current investment rules fit for the future?

As we all know, when investors decide to invest in a company, they look at financial data -- sales growth, cash flow, market share, asset valuation -- it's pretty cool.

It's only natural to do this, but it's not enough.

Investors should also look at a company's performance in terms of so-called ESG, which stands for environment, society, and governance.

The environment includes energy consumption, water usage, waste and pollution, and efficient use of resources.

By society, I mean human capital, employee engagement and the ability to innovate, including supply chain management and labor rights and human rights.

Governance is the oversight of corporate activities by management and investors.

As you can see, it's a very delicious story.

ESG is a sustainability metric, and in sustainability investing, ESG factors are also scrutinized in the investment process, along with financial factors.

In other words, by minimizing the damage to people and the planet, we limit the risks in the future. Here, we choose to invest in places where we can use that capital to produce productive, sustainable outcomes.

If sustainability became financially important and all metrics were more predictive, would the private sector pay more attention?

Amazingly, most CEOs already do.

We see sustainability as not just important, but critical to business success.

Nearly 80% of global CEOs see sustainability as a source of innovation and a competitive edge in their industry

In addition, 93% of CEOs see ESG as a future thing – something that will become important to their business in the future.

So the CEO's view is clear.

There's a big business opportunity in sustainability.

So in practice, how do companies use ESG to drive business success?

Let me give you an example of our

In 2012, State Street consolidated 54 applications into a single cloud environment and retired 85 applications.

Virtualized operating system environments and accomplished various automation projects

Through these activities, we have made it possible to work from anywhere, reduced property maintenance costs, reduced annual operating costs by about $23 million, and cut 100,000 tons of carbon dioxide emissions.

This amount is equivalent to the gas emissions of 21,000 cars.

Isn't that amazing?

Another example is Pentair.

Pentair is an American conglomerate that sold its main power tools business about 10 years ago and invested the proceeds in its water business.

It's a big bet. Why?

Apologies to Home Improvement fans, but water has more growth potential than power tools, and Pentair is aiming for what they call a "new, new world."

It's a world where four billion middle-class people want food and energy and water.

Do you think so? I think this is a special case

Is it right?

Do sustainability-conscious companies also perform better financially?

It may surprise you, but the answer is yes

Statistics show that companies with good ESG numbers do as well as others.

The blue line is the MSCI World Index

This is the number for large companies in developed countries around the world.

The yellow line represents companies with the highest ESG indicators.

Over 3 years no trade-off between ESG and business performance

ok i want more

In some cases, ESG may lead to higher performance

The blue line shows the performance of 500 of the world's largest companies, and the yellow line shows the companies with the highest levels of climate change strategy and risk management.

Over the last eight years, about two-thirds of the time, these companies outperformed.

This is correlation, not causation

But it certainly shows that environmental pioneering can go hand in hand with good returns.

If the returns are equal or better and good for the planet, shouldn't this be the norm?

Will investors, especially institutional investors, be interested?

There are some that are interested, and there are a few that are leading the way.

HESTA is

HESTA is an old age pension trust for medical and social service workers in Australia with total assets of approximately 2.2 trillion yen.

HESTA believes that ESG can affect risk and return and that consideration of ESG in the investment process has become a major obligation - at the core of their obligation to maximize the benefit of trust members.

You'll love Australians, won't you?

So is CalPERS.

CalPERS is a public pension fund for civil servants in California with total assets of approximately 24 trillion yen, the second largest in the United States.

It's the 6th largest in the world

CalPERS incorporates ESG into the system across the fund to ensure 100% of its investments are sustainable investments.

I wonder why? If you don't, you won't get good long-term returns, that's all.

In the words of Calpers, “To create long-term value, there are three capitals that should be effectively managed: financial, human, and physical.

That's why we stick to ESG."

Now, in my line of work, I talk to a lot of investors, and not everyone thinks this way.

I often hear things like, "What we should do is maximize returns, and we're not going to do that here," or "We're not going to use our portfolio as a tool to express our policy."

And the thing that really irritates me is when people say, "If you want to do something like that, just make money and donate the profits."

utterly disgusting

What I want to clarify here is

It's not just companies and investors that are responsible for the future of our planet.

Societal obligations also have limits. Whether it's prudent investment or financial theory, we're not servants to sustainability.

But it's compatible

So I'm not going to talk about tradeoffs here.

Institutional investors are the X factor in the sustainability field

why do they hold the key

The short answer is because we have money.

(Laughter) A lot of money.

really a lot

The world stock market is worth 550 trillion yen

The bond market is 780 trillion yen

Together, it's 1.33 trillion yen.

Equivalent to 8.5 times the US GDP

the world's largest economy

It will be a great weapon.

So we can rethink pressing issues like clean water, clean air, food for 10 billion people, if only institutional investors were incorporating ESG into their investments.

Why don't we allocate more money to the companies that use that weapon to try to solve these problems, or at least try not to make them worse?

What if you worked, saved, invested, but what awaited you in retirement was a world that was more stressful and unstable than it is today?

What if there was no more clean air or water?

The obvious question must be: what if this sustainability risk is exaggerated and overestimated? In fact, there is no urgency, and it may be just a virtuous consumption style or a difference in lifestyle.

Here's what President John F. Kennedy has to say: "There are always risks and costs to action, but they are small compared to the long-term risks and costs of taking it easy."

Granted, this risk is speculative, but it's based on a widely accepted belief in science that the odds of you missing the mark are much higher than the odds of your house burning down or being in a car accident.

Well, if you live in Boston, it might be different (Laughter).

With sustainability investing, we are doing two things.

We insure ourselves to reduce risk to the planet and the economy, without sacrificing our business performance, even in the short term.

["What if this is a hoax and has created a good world for nothing?"] You seem to like it, and I like it too.

(Laughter) I like it because it makes fun of both sides of the climate change issue.

you don't know where i stand

But I really like it because it reminds me of Mark Twain's words, "Be prepared for the future, because that's where you'll spend the rest of your life."

thank you

(applause)

Today, I want to talk to you about something powerful and fundamental that determines who we are: our voice.

Each of us has a unique voiceprint that reflects our age, size, lifestyle, and even personality.

Henry Wadsworth Longfellow wrote, "The human voice is the organ of the heart."

As a speech scientist, I was fascinated by the mechanics of speech production and found a way to artificially create it.

i will share this with you

First, I'm going to play a sample of a voice that some of you may know.

(Audio) Stephen Hawking: "I thought it was pretty clear what I meant."

What you heard was the voice of Professor Stephen Hawking.

What you may not know is that the same voice can also be used by children like this little girl who have neurological disorders and cannot speak.

In fact, these people often use the same voice because their vocal options are so limited.

In America alone, there are 2.5 million people who cannot speak, and many of them use computers as a means of communication.

Around the world, millions of people use artificial voices, and Professor Hawking is one of them with an American accent.

This kind of impersonal synthesized speech really struck me a few years ago when I was at a conference on technical assistance for people with disabilities, and I walked into an exhibition hall and saw a little girl, a grown man, talking on different devices, all with the same voice.

As I looked around, I saw the same thing happening around me, literally hundreds of people using very limited voices that didn't fit their bodies and personalities.

You can't imagine giving a little girl a prosthetic leg made for a grown man.

So why not artificial voices?

I was very worried about this and wanted to do something about this situation.

What you're going to hear are audio samples from two people with severe speech impediments.

hear how it sounds

uttering the same content

(1st voice) (2nd voice) You may not have understood what they were talking about, but you should have heard their unique voices.

The next thing I wanted to do was to use this remaining speech capacity to develop technology that could be customized to the user, a voice that could be customized for them.

So I turned to my collaborator, Tim Bunnell, for advice.

Dr. Bunnell is a leading voice synthesizer, and what he's doing is taking pre-recorded samples of his own voice and reconstructing it to create a personalized voice.

The target audience is people who have lost their voice due to an acquired disability.

There is no such thing as a "pre-recorded audio sample" for people born with speech impediments.

But what I thought was that I should be able to revive that person's voice from the faint voice that was left behind.

So I decided to work on this

With a small amount of funding from the National Science Foundation, we began developing personalized voices that reflected the unique vocal characteristics of the speaker.

We named this project "VocalD" or "vocal I.D."

Now, before I show you how this custom voice was created and how it actually works, I'd like to give you a very brief lecture on the science of speech, okay?

First, our voice changes dramatically as we grow.

A young child's voice is different than a teen's voice, and an adult's voice is different.

you all experience this

The second fact is that vocalization occurs when a vibrating sound source emanating from your larynx passes through the rest of the vocal tract.

Spaces in your head and neck vibrate to filter sound sources and produce vowels and consonants.

So the filtering of the sound source is the mechanism of vocalization.

This is what happens to each person.

As I mentioned earlier, I've been involved in understanding and studying the properties of sound sources in people with severe speech disorders for a long time, and what I've found is that even if their filters are impaired, the sound source is still tunable: the pitch, the loudness, the tempo of the voice.

These are called prosody, and years of research have demonstrated that prosody is alive and well in people with language disabilities.

So when I realized that these expressions were also important to the identity of the speaker, I came up with this idea.

It took the source of the person you wanted to speak, and it's still there, and I thought, what if I borrowed a filter from someone who was the same age and size as the target person and mixed it with this clear voice?

The synthesized voice is as intelligible as the surrogate speaker borrowed from the filter, and it's also similar to the identity of the speaker we're targeting.

it's that easy

This is the science behind what we do

So once you have an idea, how do you actually build a voice?

First I had to find someone to give me a filter First I had to find someone to give me a filter

It's not difficult at all

Being a donor is just uttering hundreds or thousands of words.

This process looks like

Voice: Things Happen in Pairs

i love to sleep

It's a cloudless blue sky

This goes on for about three to four hours, and the point here is not to have a proxy say what the subject wants to say, but to pick up all the different sound combinations that occur in the language.

The more samples you have, the better quality voice you get.

Once the recording is done, the next thing we need to do is analyze the text that is read and break it down into linguistic components -- single sounds, two-tone combinations, and sometimes whole words -- into datasets, or databases.

Let's call this database an audio bank.

The power of voicebanks is that you can say new words from these voicebanks, like, "I like chocolate."

Voice: I like chocolate

this is speech synthesis

It's a technique we use called waveform splice synthesis.

this is nothing new

The new thing is, how do we get this young woman to speak like she's speaking?

her name is samantha

I met her when she was nine years old, and my team has been building a voice for her.

We started by finding a surrogate donor and asked Samantha to do some vocalizations.

She could only vocalize primarily vowels, but that was enough information to draw out her sound source characteristics.

The next step is best described by my six-year-old daughter.

My daughter said, "You're mixing paints to color your voice, aren't you?"

It's beautiful, isn't it?

Samantha's voice, like concentrated food coloring, blended with her surrogate donor's recorded voice, mixed with her surrogate donor's recorded voice, gave it a pink voice, exactly like this.

Samantha: oh oh oh

Now I can speak like this

Samantha: This voice is mine

I look forward to speaking with my friends in a new voice

Thank you. (Applause) I will never forget the sweet smile that spread across her face when she first heard this voice.

There are millions of people like Samantha around the world. Millions. We are just getting started.

So far, our efforts have focused on finding people who provide a voice within the United States.

We're bringing together a few people and using them to build our first ever personal voice.

But there's a lot to do

For example, Samantha's surrogate donor is from the Midwest, and a total stranger gave her the gift of her voice.

As a scientist, one of the things I'm most excited about is finally taking the work I've been doing in the lab and making it real-world impact.

The next thing I'm going to share with you is how we take this work to the next level.

My vision is for people from all walks of life around the world, people of all sizes and ages, to become surrogate donors and give people voices that are as colorful as they are individual.

As a first step towards making this happen, we launched a website called VocaliD.org, a site that invites voices and expertise to bring together people who support our vision in many ways.

Donating blood can save lives

Giving your voice can change the lives of others.

Just a few hours of voice samples from a surrogate speaker and even one vowel sound from the recipient can create a unique vocal identity.

This is the science behind what we do.

I'll end by going back to the human part that inspired this work.

About five years ago, the first voice we created was for a boy named William.

When my mother first heard this voice, she said, "This is exactly William's voice, if he could speak, it must have sounded like this."

Then William types a message on his device.

I wondered what he was thinking

After nine years of using other people's voices, a boy finally got his own.

how do you feel

William said, "This is the first time I've ever spoken with my own voice."

thank you

(applause)

Thirteen years ago, the goal was set to eradicate poverty.

Some were successful, but hit a big wall.

The impact of the financial crisis began to affect aid payments, which fell for the second year in a row.

My question is, can we use what we've learned from bailouts of financial institutions to overcome this problem and bail out millions of people?

Couldn't we issue banknotes for aid?

"It's unreasonably decided."

everyone will answer yes

(Laughter) The story ends here.

like John McEnroe

Some may say, "You're kidding!"

I can't imitate McEnroe, but I'm serious. These two children, as you'll see later, are the driving force behind my story.

Pier is on the left

i live in england

I have loving parents, one of whom is standing in front of you right now.

On the right is Dorothy, who lives in rural Kenya.

One of the 13,000 orphans and poor children, these children live on donations.

I support it because I think Dorothy deserves the best chance in life that I can give my daughter.

no one would argue with that

Even the United Nations agrees

The United Nations' overarching goal of international aid is the pursuit of a life of dignity for all.

But there's a problem: Will we have the financial resources to make this ambition a reality?

Looking back at history, the answer is no.

In 1970, governments set a goal of increasing international aid to 0.7 percent of national income.

As you can see, there's a big gap between the actual aid amount and the target amount.

But if you look at the Millennium Development Goals, they aim to reach eight ambitious targets by 2015.

One of the targets is "to end extreme hunger and poverty," and you can see what I mean by "ambitious."

achieved some success

The number of people living on less than $1.25 a day has been halved

But we have a lot to do in the next two years.

1 in 8 people are hungry

Considering this venue, the people in the front two rows don't have access to food.

We can't be complacent about this outcome. So the concerns about the eighth Millennium Goal, which I said at the beginning of aid declining, concerns about financial resources, are very troubling.

So what do we do?

I work in financial markets, not development.

How do investors react to policy and the economy, because I study investor behavior.

You can look at the aid issue from a different angle

What made me realize this was an innocent question from my four-year-old daughter at the time.

On my way to the cafe with Pia, I passed a man asking for donations.

I didn't donate because I didn't have change.My daughter was disappointed.

When I entered the café, Pia took out a coloring book and began to draw something.

I asked her what she was doing, and she showed me a picture of a five-pound note that she was going to give to the man.

He's a very kind boy. He was very different from his father.

But of course I said, "That's no good."

And my daughter responded like a four-year-old, "Why not?"

I'm excited because now I think I can answer that question.

And so I'd like to begin by explaining how prices go up indefinitely when an unlimited money supply turns to finite commodities.

This exchange has never left my mind, not only for the relief that will be on my peer's face when I finish speaking, but also because it ties into the sanctuary of the money supply, which is becoming less of a sanctuary in the central bank's response to the financial crisis.

To reassure investors, central banks began asset purchases and encouraged investors to do the same.

For this purchase, the central bank creates banknotes.

does not actually print

I feel like I'm trapped in today's banking system.

It was an unprecedented amount anyway.

Together, the Federal Reserve Bank, the Bank of England, and the Bank of Japan increased the money stock to $3.7 trillion.

The amount of dollar bills in the market has tripled, actually more than tripled.

Three times!

It was completely unthinkable before the financial crisis, but it was readily accepted.

The price of gold, which is supposed to be an inflation-proof asset, jumped, but investors also bought other assets, like fixed-income securities and government bonds.

You bought an asset that wasn't good during inflation.

also invested in stocks

All this scary story tells the story of real investors and their rapid acceptance and trust.

Now, trust is built on two pillars.

First, it has controlled inflation for years. Central banks are trusted to stop printing money and adjust when inflation threatens.

Second, inflation is not a threat.

As you know, inflation has been below average in the United States for much of this period.

it's the same with other

So how does this help?

This leads to Dorothy and the Mango Tree fundraiser that supports her.

I got the idea to make a one-time donation when I attended one of the fundraising events, because I remembered that my company solicits ideas from employees and donates them.

So I figured out how I could double my contribution so that not only Dorothy but four of her classmates would receive a few years of secondary education.

wonderful

In addition to that conversation with my daughter, when I learned that despite the printing of money, there was no inflation, and international aid was declining at the wrong time, I wondered if we could do the same thing on a much larger scale.

Let's call this initiative "Print Aid"

Here's how it works

Given that there is little risk of inflation, we will require the central bank to increase government foreign aid to a certain limit.

Governments' aid target has long been 0.7 percent, so let's say half of that is 0.35 percent of national income.

So if the government spends 0.2 percent of national income on foreign aid in a given year, the central bank will add 0.2 percent to match.

So far, so good

What about the risks?

In this case, the money is issued to buy the goods, not the assets.

Doesn't it sound like inflation?

But there are two important factors

First and foremost, the paper money we issue must be used abroad.

So unless the money devalues, it's obviously not going to lead to inflation in the paper-issuing country.

Second, because of the size of the paper money issuance in this initiative, a currency depreciation is unlikely.

Let's say, for example, "Print Aid" happened in the United States, the United Kingdom, and Japan.

Matching the aid that governments have given over the past four years, Print Aid will generate another 200 billion dollars in aid.

What does it look like in the context of what actually happened in these countries to increase their money stocks to save their financial institutions?

Is it OK?

I think you'll probably have a hard time finding the difference

Now, I want you to think about a time when a $3.7 trillion bet was made to save a financial institution.

there was no inflation

So is adding $200 billion in aid worth the risk?

Is there any difference?

i don't know the difference

The impact on aid is clear

Issuing by just three central banks increased international aid by about 40 percent over this period.

Aid as a percentage of national income suddenly rises for the first time in 40 years.

currently falls short of 0.7 percent

Governments are encouraged to give more aid

But that's the whole point of the matching scheme.

I think we've learned that the risks associated with printing more money are quite modest, and the benefits are immense.

Let's see what we can do with 40 percent more money.

People in the front row can eat

My only fear, other than running out of time, is that opportunities like this are only for a short time.

Today, the issuance of money by central banks is allowed as a matter of policy.

it won't be like that forever

There is now a universal understanding of international aid.

This won't always be the case

Now is our only chance to give the help we've been waiting for.

Let us issue paper money for international aid.

I would like to ask seriously why not?

thank you

(applause)

What is bioenergy? it's not about ethanol

Bioenergy isn't about global warming. Counterintuitively, bioenergy is about oil, gas, and coal. Whether we can rationalize the oceans, launch satellites into orbit around the Earth, or heat our microwave ovens as part of a bridge to the future depends on understanding and managing bioenergy. So let's look first at agriculture.

Cultivation has a history of about 11,000 years, and what I've learned from agriculture as a technique for planting crops is getting rid of pests.

And then we got power, and irrigation changed agriculture.

With irrigation, you can plant crops anywhere. Until then, they were limited to areas where rivers flooded. Eventually, this kind of organic farming began to use machines. With mechanical power and large amounts of water, agriculture became very large-scale.

If you throw in mechanical power and water, you get this landscape.

It's all about brute force, and it's the same with energy. What I've learned from agriculture is that by combining systems and advancing the study of systems based on biology, we're able to move away from mass tactics. We're moving away from the principles of engineering and chemistry and into the realm of biology.

I'm Norman Borlaug. He's been awarded a Nobel Prize and an honorary mention. He deserves all of these things. He's been recognized for feeding more people than ever before. We miss the fact that we're running out and exporting more grain.

Ironically, in Mexico, where he was working, he didn't adopt this technology, he ignored it, and while he was talking about it, he didn't apply it in practice.

Mexico, which has not adopted its own technology, has remained a major importer of grain ever since. It has never given credit to him, and there are no statues of him anywhere in Mexico.

Not only did he feed millions of people around the world, but he revolutionized technology with his knowledge of biology.

What happened to agriculture? If you look at the past hundred years of agriculture, agriculture around 1900 could have been understood by a farmer a thousand years ago. Even if hoes are different and mules are replaced by tractors, farmers should be able to understand what is being done and why, and what will happen. improved as

So from 250 hours to produce 100 bushels, it went from 40 to 15 to 5 hours. Productivity increased sevenfold between 1950 and 2000. The rest of the economy grew two-and-a-half times.Per capita production increased significantly.

Not only "amber rippling grain", but also a large amount of produce.

50% of the EU budget is spent subsidizing overgrown agricultural products.

I wish this was energy, but by now, I'm sure you're thinking, "Hey, I'm here to talk about energy, and this guy is talking about biology."

How do these two connect?

So the tricky part about bioenergy is that we're talking about a system that we don't understand. We don't know what oil is. So where does oil literally come from?

If this theory is true, oil and all hydrocarbons are concentrated sunlight, and this is where it gets interesting. Bioenergy is not ethanol. Bioenergy is energy from the sun concentrated in amoebas and plants, which might be why you see these rainbow colors.

Now, if you think of hydrocarbons as concentrated sunlight in this system, bioenergy works uniquely, and petroleum and other hydrocarbons have to be considered part of these solar panel systems.

This may be why oil wells seen from the sky in Texas look so much like irrigated farms in Kansas.

This is how we harvest oil. So let's take a look at how oil extraction has progressed. What did we learn from starting with the brute force approach?

This is Athabasca, where they mine a lot of tar sands. The world's biggest trucks are also used here. This black mixture is sand-bound, non-flowing oil. We use a lot of steam here to separate the oil.

Coal turns out to be practically the same thing, most likely a plant, except that it was burned and crushed under pressure.

If you take something like this and burn it and put some pressure on it, you'll probably get this, but again, I'm not sure.

It's strange that people are talking about coal.

Needless to say, coal mines are very dangerous places because they can produce gas, and explosions can kill people.

And that difference raises an interesting question: What do we do with gas? Now, back to coal, we're applying pretty much the same methodology with exactly the same technology.

If you go too far with quantity, you're going to shave off an entire mountain, and you're creating the single largest source of carbon emissions, which is a processing plant that gasifies coal, which is probably not the best use of bioenergy.

It's important to find alternatives to this system, because even though America's oil reserves are declining, coal reserves aren't. China is no different. Coal reserves are huge, and we should rethink this as bioenergy, because if we continue to treat it as chemical and industrial energy, we're going to be in big trouble.

Gas has the same problem. Gas is also a biological material.

It's called coal bed methane. What's interesting about this picture? If coal is the concentrate of plants, why does the gas come out differently from mine to mine? Some mines explode, others don't.

(Laughter) It's a well-known phenomenon. (Laughter) There might be a similar biological process in coal mines, where you eat something and you produce a lot of gas. So, it seems likely that there are other ways to get energy out of coal than by drilling down mountains and burning coal.

This is bioenergy. It's not ethanol. It's not subsidies to a handful of companies. We're not importing corn into Iowa because we built too many ethanol factories.

We've got a few indicators of productivity. If you put steam into a coal mine or an oil field that's been running for more than a decade, you'll see an increase in output, say an eight-fold increase.

Speaking of biomaterials, this guy was part of the human genome sequence, and he's sailed around the world, doubling the database of genes and proteins. He's also tackling the energy problem.

I think about it this way: I study the technology of programming living things for a purpose.

Cells are the hardware, genes are the software, and within that technology we see life as an interchangeable program that can be energy, it can be food, it can be fiber, it can be human, it can be anything.

What is the underlying principle and where are we going? The person on the screen is a gentleman, a great man, a man of extraordinary character, Hamilton Smith, who developed a technology to cut genes, which won him a Nobel Prize, called a restriction enzyme.

He did the research at Hopkins, and his mother called him, humbled, and said, "At Hopkins, another Mr. Ham Smith, whom I don't know, won the Nobel Prize."

It's the first attempt to transplant naked DNA. We took the whole DNA from one cell and injected it into another cell.

When you think about this technology and what it means, there's more to do than turning corn into ethanol with very high subsidies. Biology is moving into the realm of energy, and we're spending a lot of money and energy to create energy.

It's a block of sulfur collected from the tar sands of Alberta. When you separate the sand from the oil, you use a lot of energy to create steam, and the water vapor separates the components. And you have to separate the sulfur as well.

If we can extract even a fraction of the energy that makes this, we can start extracting energy in smaller systems based on biological principles. From here we have to scale up our technology to catch up with wind, solar and nuclear power.

For the time being, at least for the next decade, whether it's oil, gas or coal, the target is hydrocarbons. Now, without getting too long, here's what's happening to our energy system.

86% of the energy we consume is hydrocarbons, so 86% of the energy we consume is probably metamorphosed plants or amoebas. This is where resource conservation and alternative energy play a role, but we also have to address the waste.

Waste management is a bridge to the future. There's something to ponder about this bridge to the future. Right now, two-thirds of our oil is left in the oil fields.

So the last topic, the last graph, we have to stabilize oil prices, and here's what oil prices look like.

And this system is really messed up, because it's set at a very low target rate, whether it's solar or wind power, what happens when you have a really good idea.

The oil price hits rock bottom, the new company goes bankrupt, and then the oil price goes back up.

So at the end of today's talk, I'd like to suggest that we stabilize the price of oil in Europe and the United States. How do we do this? Let's put a tax on oil, not a sales tax. It's to fix the price of oil for the next 20 years -- to a set price of $35, $40 -- if OPEC goes below that, tax it. If OPEC goes above that, no tax.

How it works 35 -- 40 -- under $50 a barrel -- the amount is debatable -- developing energy for less than that is a business. But let's not allow price volatility to make research worthless.

What are the requirements for a good leader today?

When we think of a leader, we usually think of an all-powerful superhero who takes the lead and protects his followers.

But that's a thing of the past. Equally outdated are leadership development programs.

We surveyed 4,000 companies and asked them how effective their leader development programs were.

58% of companies say they have the ability to take on critical leadership roles – there is a significant shortage of talent.

So even though companies have internal and external training programs, appraisals, coaching, etc., more than half of the companies are not producing enough good leaders.

Do you think so? I wondered if my company would train me to be a great leader in the 21st century.

probably not

I've spent the last 25 years working to see what makes a great leader.

I've worked for Fortune 500 companies, advised over 200 CEOs, and built more connections with leaders than you might imagine.

But a few years ago, I noticed something disturbing about potential leaders.

In other words, in spite of these efforts, many people are suffering from the same troubles.

This is Chris, who has great potential to be a great leader, but after moving to a new department, he made a mistake that caused irreparable damage.

And I've heard stories like Sidney's about how frustrating it can be for a company's CEO to be described as "the best company to work for as a leader," but in fact, only one of the top 50 leaders in the company was entrusted with critical strategy.

And I also hear a lot of stories about how veteran leaders who've been through the good times can't keep up with market changes, and eventually end up being forced to shut down their companies if they don't cut them in half.

Seeing this happen over and over again, I naturally had two questions.

Why is this leadership gap continuing to widen, contrary to the trend of strengthening leadership training?

What makes great leaders grow differently?

I -- this question filled my head, and hearing all these stories became so unbearable that I quit my job and decided to pursue this research full-time. I spent a year traveling around the world, learning how leadership is practiced in different companies, countries, and non-profit organizations -- what works and what doesn't.

For example, when I visited South Africa, I had the opportunity to meet Nelson Mandela, and I was able to understand how he was able to look ahead of his time, anticipate and guide political, social, and economic trends.

I've also met many leaders of non-profit organizations who, despite their very limited resources, are leaders who have had a huge impact on the world, even involving seemingly enemies.

And then I spent countless hours researching in the presidential library, trying to figure out how the environment made a leader a leader, what led him to act like a leader, and how it influenced him in ways that would endure for generations to come.

And then, when I returned to full-time work, I was blessed with wonderful colleagues who were interested in the same questions at my current job.

Through these experiences, I've discovered the differences in the characteristics and behaviors of people who thrive as leaders.

Here are a few

[ What are the requirements for a good leader in the 21st century? ] The world in the 21st century is more global, digital and more transparent than ever before.In addition, the speed of information flow and technological innovation is so fast that everything you do requires a complex foundation.

In fact, traditional appraisal methods -- limited 360-degree assessments and outdated performance reviews -- can mislead you into thinking you're more ready to become a leader than you actually are.

21st century leadership depends on three questions.

Where are you looking at your business model, your life, where do you anticipate the changes that are coming?

The answer is on your schedule

who are you spending time with? What topic?

where are you traveling what are you reading

And how can you use this experience to sense the signs of change, make a decision to act now, and are you ready to go?

In one team of leaders, each member of the team brings together examples -- examples of trends that have affected them -- that they share to make strategic course corrections and change-oriented decisions.

Good leaders don't look down

Look around the corner and shape the future instead of just reacting to the status quo.

The second question is how do you diversify your personal and professional networks?

You hear a lot about academic cliques, and in fact those networks are still many organizations.

But it's a matter of degree, and we're connected to people who are comfortable to be with.

So the issue here is your ability to form relationships with people who are very different from you.

The differences here can be biological, physical, functional, political, cultural, socioeconomic.

Despite these differences, if you build relationships with these people, they will trust you enough to help you and help you achieve your goals together.

All great leaders know that having a diverse network of contacts allows them to see patterns and find solutions more broadly, because they have people on their side who think differently than they do.

The third question is: Can you dare to let go of the ways that have made you successful in the past?

There's an expression like this: "Don't make waves."

But if you follow this advice, perhaps as a leader you'll just follow suit and repeat the easy things.

Great leaders dare to do things differently

We don't just talk about risk taking, we actually do it.

A great leader once told me that it's when you've developed the emotional stamina that you're able to endure being told your new ideas are naive, reckless, or just plain crazy that you can make a big impact.

The interesting thing is that the people who try to join us in this way aren't the usual familiar faces.

They're usually people with different ideas who want to join you and make bold strides forward.

It's not just progress, it's progress

Answering these three questions than any traditional leadership training program will help you find out if you're a 21st-century leader.

So what are the requirements for a great leader in the 21st century?

I've met many great leaders, and they've all been outstanding.

What these women and men have in common is that they are always prepared. Rather than resting on the laurels of the past, they prepare for the realities of today and for all the unseen possibilities of tomorrow.

thank you

(applause)

I'll say something that's not in the script. Let's make it a venue participation type and have Chris, the moderator, be nervous.

Okay, okay? let's go

Okay, so if you've ever heard a man and a woman having sex, please raise your hand.

Neighbors, hotels, parents, oops, excuse me

ok almost everyone

This time, whoever thinks that the man was louder than the woman at that time, raise your hand

There is a man raising his hand

Let's not count if it's you

(Laughter) Oh, you dropped your hand, and there's one woman.

You are sitting next to a man who speaks loudly at that time

Now what does this mean?

What this means is that humans vocalize when they have sex, and women generally vocalize.

It's the so-called "female intercourse vocalization".

Oh yeah, I didn't mean to say it here, but Meg Ryan might be here, because she's the most famous woman in the world when it comes to sexual vocalizations, thanks to that famous scene from the movie "All I Want to Do".

If Meg Ryan is here, we should talk about this.

Well, we'll talk about it later.

So let's start by saying that humans don't descend from monkeys. You think we evolved from monkeys, right? No, humans are more like monkeys

We humans are much more closely related to chimpanzees and bonobos than we are to African elephants to Indian elephants, according to an old book by Jared Diamond.

Moreover, chimpanzees and bonobos are closer to humans than chimpanzees and bonobos are to other apes, to gorillas, orangutans, and so on.

We're very close to them, and as you can see, we're somewhat similar in behavior.

So the question I want to explore with you today is what kind of monkeys are we in terms of sexuality?

There's a story that's been popular since Darwin's time, and that's what Casilda and I have dubbed "The General Theory of Human Sexual Evolution."

In a nutshell, it's human nature, and since the dawn of mankind, men have kind of borrowed the fertility of women by offering goods and services in exchange.

In general, men give women things like food, shelter, social status, and security.

A woman, on the other hand, will be loyal to a man, or at least promises to do so.

Now, this relationship created a conflict between men and women.

Does this mean that the fight between men and women is genetic?

Casilda and I argued otherwise. We thought that this economic and hostile relationship was actually a by-product of agriculture, which is only 10,000 years old at the earliest.

Anatomically speaking, modern humans arose about 200,000 years ago, so this kind of male-female relationship has occurred only recently, at most about 5% of the history of the distinctly human species.

Before agriculture, before the Agricultural Revolution, the times were different. Humans then lived as hunter-gatherer groups, and regardless of their habitat, these types of groups exhibit what anthropologists call "fierce egalitarianism."

They shared things, or rather, sharing was essential: flesh, shelter, protection from the outside. These were commonly thought of as exchanges for female fidelity, but in fact, sharing everything is prevalent in these societies.

Now, I'm not saying that our ancestors were noble savages, and certainly not that modern hunter-gatherers are.

What I'm really trying to say is that this system was clearly the best risk aversion in the hunter-gatherer societies of the time.

Among anthropologists, it's now an indisputable fact.

Me and Kasilda have delved into this shared culture to sexuality.

Our theory is that human sexuality evolved right up to the agricultural age as part of building complex and flexible social structures and networks.

Now, this might be offensive to some of you, and that's what I always do when I talk about this sort of thing, but I'll take a moment to explain that our ancestors had sex with random numbers, but I'm not saying that we had sex with strangers indiscriminately.

"Others" never existed, do you understand?

In hunter-gather societies, there is no concept of strangers.

We are all together from birth to death

Their sexual relationships were certainly redundant, and our ancestors probably always had multiple sexual relationships in adulthood.

But even if they were associating with random strangers

Even if I didn't love the person I was dating

I wouldn't say we weren't in a relationship.

It's just that sex was open rather than exclusive.

And those who have chosen to be monogamous -- my parents, for example, have been married for 52 years and have been single to each other, and if there were anyone else, Mom and Dad, please don't tell me.

Because to claim that our ancestors were sexually promiscuous is not to criticize monogamy any more than to say they were omnivores who also ate meat is no more a criticism of vegetarians.

It's up to you to become a vegetarian, isn't it? Just because you've stopped eating meat doesn't mean you'll immediately stop being drawn to the delicious smell of bacon.

May I? here is the point

(Laughter) Do you finally understand?

Now, in addition to being an extraordinary talent, a great man, a great husband, and a great father, Charles Darwin was one of the rare hardliners of the Victorian era.

Look, he was puzzled about the genital bulges of some primates, including chimpanzees and bonobos, because these sexual bulges attract not just one, but many males.

He had no idea why females evolved the way they did if all animals were meant to be snails.

By the way, what Darwin didn't know at the time was that chimpanzees and bonobos mate between one and four times an hour, and when the numbers are high, they can mate up to a dozen or so a day, but only during the mating season.

And interestingly, chimpanzees have this male-attracting bulge for a whopping 40 percent of their menstrual cycle. Bonobos have 90 percent. And humans are the only species on earth that can mate throughout a woman's menstrual cycle, whether she's menstruating, postmenopausal, or even pregnant.

This is a very rare feature among mammals.

It's one of the most interesting aspects of human sexuality.

Now, Darwin himself pretended to be oblivious to these sexual bulges during his lifetime, as is often the case with scientists. (Laughter)

Okay, so now I'm going to talk about sperm competition.

Humans release about 300 million sperm in a single ejaculation, and it's already a pretty competitive world in that alone.

The question is, is this competition for other men's sperm, or is it between our own sperm?

I have a lot to say about this

First of all, there's one thing I'd like to draw your attention to in this diagram: the chimpanzee bonobo human female.

Represents a female intercourse vocalization

see also the numbers

On average, humans have about 1000 times of sex before becoming pregnant.

There are people who think this number is high, and people who think it's low.

Chimpanzees and bonobos have similar numbers.

But the other three species of monkeys are different: gorillas, orangutans, gibbons, and the more typical mammals, the apes, only have about a dozen matings per conception.

By the way, only humans and bonobos have sex while looking at each other's faces, of course, while they're both alive...

(Laughter) Now, all humans, chimpanzees, and bonobos have testicles on the outside of their bodies.

With beer cold in your garage, you're all set for when the party starts.

It's the same reason you have testicles outside your body.

That's where the sperm is kept cold, so you can ejaculate as many times as you want.

This is true, not bad (laughs)

Also, some of you may be happy to hear this, but humans have the largest and thickest penises of any primate.

There's more than anatomical evidence for this.

It is also clear from anthropological

In addition, there are records from around the world that show that humans throughout history have engaged in sexual habits that would be impossible if the current theory of sexual evolution were correct.

Pictured is a woman from the Mosuo tribe in southwestern China.

In this society, both men and women are completely open about sexuality.

There is no concept of shame about sexual behavior.

Women have hundreds of partners to have sex with.

No one cares, it's not rumored, it's not about making an issue

Once pregnant, the mother herself and her brothers and sisters take care of the child.

It doesn't matter who the father is.

On the other side of the world, in the Amazon, there are many tribes that have adopted a system called "split paternity" in anthropology.

They all believe in one concept in common, even though they don't have any inter-ethnic exchanges or a common language, which is to say, it didn't come from anywhere, it arose naturally in many parts of the world -- the idea that a lot of sperm can conceive a baby in the body.

So, for example, a woman who wants to have smart, strong, interesting children, associates with many smart men, funny men, strong men, and tries to pass on their strengths to the child, and when the child is born, more than one of these men will come forward to claim themselves as the child's father.

In this society, fatherhood is, in a sense, teamwork.

I gave many other similar examples in the book.

Now, why is this important?

Edward Wilson says that a person's sexuality is a connecting tool, and reproduction is secondary.

I think you're right, because our evolved sexuality is wreaking havoc all over modern society.

A lot of suffering is wasted because of the discrepancy between what we've been taught to feel and what we actually feel.

I hope that a more accurate and modern understanding of sexuality will allow us to be more tolerant of ourselves and of each other, more understanding of unconventional forms of sexual relations, such as same-sex marriage and polygamy, and an end to the notion that men have an instinctive and innate right to dominate and control women's sexuality.

(Applause) Thank you.

You'll also see that it's not just gay people who need to come out.

We all have things to come out, right?

And when you can tell the truth, you'll realize that you're no longer fighting other people. The enemy is the old Victorian sexuality. This misconception causes us to confuse desire with ownership, and create shame and confusion where we should understand and empathize.

Men are from Mars and women are from Venus It's old fashioned 'Cause the truth is men were born in Africa and women were born in Africa

thank you

(Applause) Chris: Thank you. Christopher: Thank you.

Chris: Can I ask you a question?

I find it confusing to use the history of human biological evolution to discuss what society should be like today.

For example, I wouldn't be surprised if someone gave a speech like this -- Humans have such sharp teeth, and brains and muscles that are so well suited for throwing weapons.

Non-violence, like vegetarians, is a matter of choice.

With the logical development you just talked about, wouldn't this kind of twisting become an ant?

Christopher: Well, first of all, it's very controversial whether high levels of violence existed in prehistoric times.

but that's just an example

It's true that many people say that just because you lived a certain way in the past doesn't mean you have to live the same way now.

We all have to adapt to modern society.

The genetic traits in our bodies are the result of evolution over time.

For example, you can live on Macs and milkshakes, but your body will resist it, because people have appetites.

I think it was Schopenhauer who said that people can act if they have a desire, but the desire itself cannot be voluntarily created.

So what I'm talking about is the shame that surrounds desire.

I mean, if you love your husband or your wife, but you're still attracted to someone else, say you have a problem with yourself, or you have a problem with your marriage, or you have a problem with your partner.

I believe that the unrealistic ideals born out of this misperception of human sexuality are destroying many families.

that's what i wanted to say

Chris: I'm sure you got it. Thank you.

Christopher: Thank you very much. (Applause)

What I'm going to talk to you about tonight is coming out. It's not what you call "coming out," or coming out as gay.

Everyone builds a wall in their heart

Hiding behind it may be telling someone you love them for the first time, or telling them that you're pregnant, or that you have cancer.

What lies beyond the walls of our hearts is a heavy story. The problems you face may be very different, but the experience of opening the door and letting go of what you've been holding back is the same for everyone.

It's scary and I hate it, but it's something I have to do.

A few years ago, I worked at a local diner called the South Side Walnut Cafe, where I went through many stages to become an extremist lesbian.

Soon after I shaved my head in my baggy cargo pants, I was often asked the question, usually by a little kid, "Are you a boy or a girl?"

The place was wrapped in an awkward silence

I clenched my teeth a little harder than usual and gripped the coffee pot tightly.

The father frantically flips through the newspaper, and the mother looks at the child with disapproval.

But I didn't say anything, just a strong feeling was swirling in my heart.

Over time, I had children between the ages of 3 and 10, and I started coming to the table in combat mode.

(Laughter) I feel terrible.

So I decided that next time I would say something.

I decided to have that heavy conversation.

In a matter of weeks, the time has come

"Are you a boy or a girl?"

And then there was that silence, but I was prepared.

In the words of Gloria Steinem

I even had a quote from "The Vagina Monologues."

I took a deep breath and looked in the direction of the voice, and there was a four-year-old girl in a pink dress looking up at me, just a child who wasn't fit to be a feminist duel partner and just wanted to know, "Are you a boy or a girl?"

I took another deep breath and squatted beside me and said, "Hey, you're in trouble, I understand.

You have short hair, you look like a boy, you dress like a boy, but girl, sometimes you want to wear pink, and sometimes you want to wear loose pajamas.

I'm a girl who loves pajamas."

She looked me straight in the eye and said without flinching, "I like my purple pajamas with the fish on them.

Can I have some pancakes? ”

(Laughter) That was it.

I'd like that pancake, please."

It was the first time that I spoke so lightly and seriously.

I wonder why? Because the pancake girl and I ran into each other at heart.

I'm sure you do too, but I've pushed a lot of my thoughts behind walls, and most of the time my walls were rainbow colored.

Once you step inside, it's dark and you can't even tell the color of the walls.

You know what it's like to hold your breath and live in the dark

After all, the world behind the wall is the same - you and yours are the same.

Of course, I can give you any number of reasons why it's harder for me than for you, but pain isn't relative.

hard things are hard

Can you say that confessing to bankruptcy is harder than confessing to cheating?

Is it harder for him to confide in than to tell a 5-year-old about the divorce?

It's not about which is harder, it's just that it's harder

We have to stop comparing our pain to others. Instead of feeling relieved or discouraged by comparing ourselves to others, we just feel that everyone is having a hard time.

In a long life, we all build walls in our hearts, and when we're inside, we feel safe, or at least better than behind doors.

But I want to tell you, no matter what that wall is made of, it's not a place for people to live.

Thank you. (Applause) Think about yourself 20 years ago.

At the time, I was wearing a strapless dress with a ponytail and high heels.

At the time, I wasn't an extremist lesbian, and I wasn't prepared to face a four-year-old in a cafe.

I was frozen in terror, curled up in a corner in the darkness surrounded by walls, with a gay grenade in my hand, even the slightest movement of a muscle felt more terrifying than ever before.

My family, my friends, my strangers -- I've lived my life trying to live up to their expectations, but now I'm turning the world upside down, on purpose.

You're tearing apart all the plots we've been following for so long, because if you don't throw away the grenade in your hand, you'll die.

The best part of letting go of grenades was tossing a grenade at my sister's wedding.

(Laughter) It was the first time I'd met so many people who knew I was gay, so I walked around the tables in black dresses and heels as a bridesmaid.

After some small talk, a woman yelled out, "I love Nathan Lane."

And then everyone started to appeal to the pro-gay faction.

"Have you been to Castro Street in gay town?"

"Actually, I have a friend in San Francisco."

"I've never been there, but I heard it's great."

"Do you know Antonio the hairdresser?

I'm sure of my skills, and I won't talk about her."

"What's your favorite TV show?

We were like, 'Are you two friends? Will & Grace

who do you like Jack

Do you like Jack?

One woman was at a loss for words, but she still wanted to support her and tell her that she was on her side, and the words that finally came out were, "Hey, my husband sometimes wears a pink shirt, too."

(Laughter) At that point, I had two options.

One is to go straight back to the table with her and her gay peers and make fun of what happened, accusing her of being naive and incapable of speaking about gays in a non-judgmental way. The other option is to empathize with them and realize that by bringing up this topic and having a conversation with them, they have also broken a wall.

Of course, it's easy to point out other people's shortcomings.

It's actually really, really hard to admit that you put yourself in their shoes and made an effort.

After all, all that is required of others is effort.

If you want to be serious with others, you have to expose yourself.

I'm still not good at heavy conversation

If you ask anyone I've dated, they'll know

But it's getting better. What I cherish is the "three principles of Pancake Girl."

I'm going to talk to you from a gay perspective, but no matter what barriers you break down, the end result is the same.

The first principle is to be what you are

Throw away your armor and be yourself

That girl at the cafe was unarmed, but I was the only one in a fighting stance.

If you want someone to take you seriously, they should know that you are a human being, too.

The second principle is to put it bluntly: remove the bandage in one go.

If you're gay, just say so clearly.

Telling a parent, "You might be gay," gives hope that something is wrong.

I shouldn't let you have such strange expectations

(Laughter) The third principle is the most important -- (Laughter) don't be sorry.

you're just telling the truth

no need to apologize

Maybe this will hurt some people. Of course, you should apologize for what you did, but you shouldn't feel bad about yourself.

Well, some people are disappointed, but that's their problem, not yours.

I have unreasonable expectations of you

Not yours in their plot

There's only one storyline that matters, and that storyline that you want to write.

If you find yourself in the darkness of your mind with a grenade in your hand, think of it as something that everyone goes through.

You may feel lonely, but you are never alone

It's hard, but we all need you, no matter what walls we have to break through. We're all hiding behind walls in our hearts, peering out through keyholes, waiting for someone to break the door.

Thank you. Have a nice night. (Applause)

i love planes

i really love you

So when I went to college in the '90s, it was natural to study aerospace science.

A surprising number of people have said to me, "Don't do aerospace science."

“Aerospace science is boring” “Aerospace science is already exhausted”

they were a bit wrong

In fact, the next decade will be the golden age of the aviation industry.

The first thing that excites me is that air travel will become more personal.

Let's do a little comparison and contrast

In the 20th century, large airliners connected cities around the world.

A hundred years ago, it would have been unthinkable that people from all over the world would fly here for a five-day conference.

But now I do it without hesitation

This is a great achievement for mankind.

But I use the car a lot on a daily basis.

Or do you force yourself to avoid using the car?

My friend lives in San Francisco, and I live in Mountain View, about 40 miles away.

everyone is busy

In the evening, it will be a traffic jam drive of about 2 hours.

I haven't seen you in months

I work in downtown San Jose, close to the airport.

Some days it's faster to fly to Los Angeles after work than drive to San Francisco.

Cities are just getting populated, roads are tight and hard to widen.

Many places don't have a good solution to congestion.

But what if you could skip the traffic?

The sky is underutilized, and it's never going to be as crowded as the roads.

In the first place, there is one more dimension, and considering air traffic control and safety, terrible traffic jams are unacceptable.

So in many cases, in the long run, flying will be a logical alternative to the car.

Imagine calling an Uber and having it take you to a nearby airfield, which we call a "vertical port," where the plane is waiting, jumping through all the traffic, and from the landing point another Uber takes you to your friend's house.

I said Uber, but it's amazing the foresight of the people who came up with the name Lyft.

(Laughter) This example might have a lot of steps.

Instead of two hours, you can fly in 30 minutes for about $60.

It hasn't happened yet, but that day is pretty close.

One thing we need is an aircraft that can take off and land in a small space and get us to our destination quickly.

Helicopters do that job today, but traditional helicopters are too expensive, too difficult to fly, and too noisy for everyday urban use.

This is changing with electric flight and autopilot.

Electric flight, in particular, enables new forms of aircraft that weren't possible in the past.

With electric motors, you can have several around the fuselage without adding too much weight.

Redundancy increases safety

Plus it's greener, cheaper and quieter than internal combustion engines.

I think autopilot will allow us to scale up our transportation network and make aircraft safer.

On airliners, most of the flight is already on autopilot, and I think the day will come when people will stop trusting planes that need pilots.

So the team inside A3 wanted to know how close this future was.

I built a prototype of such an aircraft and flew it.

We only use mature technology that is currently on the market.

Named "Vahana"

fully electric

It can take off and land vertically, but it flies like a normal plane.

It's fully autopilot

Automatically takes off, flies and lands at the touch of a button

The prototype you see here is designed to carry one passenger and one load.

You can travel about 30 kilometers in 15 minutes.

Our estimate is that a flight like that would cost about $40, and we could develop a passenger transportation business.

It has redundant motors and batteries, so if one fails, it can still fly and land normally.

pretty quiet

Passing overhead is quieter than a Prius on the road.

It is intelligent and equipped with a camera LIDAR radar to detect and avoid unexpected obstacles.

Focused on efficiency, the battery is small, light and lasts a long time.

By comparison, the Vahana battery is less than half the size of the Tesla Model S battery.

40 kilowatt hours

Can be hot-swapped in minutes

Within a few years, people will be able to comfortably ride alone in an unmanned, self-piloted electric vertical take-off and landing air taxi.

The team is working on the next version, which will have at least two passengers and a much longer range.

Importantly, there are now more than 20 companies around the world developing vehicles similar to this.

Maybe in five years, some cities will have vertiports, and ridesharing apps will have an airplane icon.

At first there will be about 10, but eventually there will be hundreds flying around the city.

And transportation in the region will be completely transformed.

In the 20th century, aircraft connected the world.In the 21st century, I hope that aircraft will connect communities and individuals.

thank you

(Applause) (Chris Anderson) So the first thing that comes up is a single-seater, right?

(Rodin Lyasoff) Yes, ours is.

(Chris) yours

I get out of the car and the plane doors open and I go inside and there's no one else there

And take off without permission

Can I take a little survey?

Because there's something new in this venue

Anyone interested in getting a solo ride in an unmanned aircraft? This is the street

(Rodin) Sounds good

CA: That's amazing. Half the people at TED are crazy.

(Laughter) (Rodin) We're very focused on cost.

whether the business will succeed

Functional choice is also highly dependent on cost.

A $40 fare is the goal

so that the public can use

CA: Perhaps the biggest hurdle to making it happen is not the technology, but the regulation of the law?

(Rodin) Yes

Technology needs to mature to the level of safety required for aircraft.

I don't think there's a big problem with that, it's just a matter of doing it.

CA: First of all, it's a rideshare.

Is it too far away for people to have this in their garage and be able to fly it straight to their friend's house?

Rodin: In my opinion, ride sharing is the most efficient way to operate.

Some millennials don't want to own a car.

Maybe even more so for aircraft

So -- (Laughter) I think the ride-sharing model would be more scalable and easier to operate, and I think air traffic control would be better centralized.

Chris: Thank you very much.

(Rodin) Thank you (Chris) It was great.

i want to talk about hackers

When you think of a hacker, you probably don't think of Benjamin Franklin, but I'm going to explain why he's associated with hackers.

What comes to your mind is more like a pale kid playing pranks in the basement, or a shady criminal trying to steal your identity -- or maybe an international hacker gang with political goals [anonymous] [anonymous].

Most people seem to have the notion that hackers are terrifying.

But like most technologies and the tech world itself, the power of hacking works for both good and bad.

Some create technology that can help you find your loved ones after a disaster, or help you monitor environmental conditions after an oil spill, against hackers trying to steal your identity.

Hacking is just an amateur innovation to an existing system Hacking is just an amateur innovation to an existing system, a very democratic act.

it is critical thinking

questioning existing practices

The idea is to try to solve a problem rather than just complain about it.

In many ways, hacking built America.

Betsy Ross Was a Hacker

"Underground Railroad" was a great hacker organization

From the Wright Brothers to Steve Jobs, hacking has always been a cornerstone of American democracy.

What I want to tell you today is that when you think about hackers from now on, instead of thinking about Julian Assange, think of one of the greatest hackers of all time -- Benjamin Franklin.

He was a prolific inventor, but as we all know, he didn't apply for a patent, because he believed that all human knowledge should be freely available.

He helped revolutionize bifocals and lightning rods -- of course, American democracy -- of course, he helped revolutionize American democracy.

And with Code for America, we try to embody his spirit.

An amateur inventor and politician, his conception of citizenship has always been action-based.

He believed that citizens make governments, and we call them citizen hackers.

The collaboration and empowerment that underlie a healthy democracy -- it's no surprise that values ​​like participation and entrepreneurship form the foundation of the Internet.

No wonder so many hackers turn their attention to government issues.

Before I give you an example of citizen hacking, I want to make it clear that you don't have to be a programmer to be a citizen hacker.

All you have to do is believe that you can use the tools of the 21st century to influence the problems facing governments.

At the Code for America Citizen Hackers Association, I hear from the Code for America Citizen Hackers Association that they didn't realize there was so much non-technical work in the project.

please remember

Everyone can be a citizen hacker

So what is citizen hacking?

Last year, we sent a team of three people to Honolulu to spend a year full-time helping government services and rebuilding the website.

It's tens of thousands of pages, and it wouldn't have been possible in the given few months, it wouldn't have been possible in the given few months.

So instead, they decided to build a parallel site on the city's website based on how citizens wanted to communicate.

Citizens want answers to their questions, and when they get them, they want to take action.

So our team launched Honolulu Answers, a very simple search interface that puts in a search term or question and gives you a simple answer on what to do.

The site itself was easy to build, but I ran into the challenge of how to add all the content, and I ran into the challenge of how to add all the content.

It would have taken a lot of time if it was just the three of us.

So they did something that was very radical in terms of administrative conventions.

they asked citizens to write

Like a hackathon (hack marathon)

On Saturday afternoon, we had a writerthon. On Saturday afternoon, we had a writerthon.

In just half a day, they've replaced the "Frequently Asked Questions," but more importantly, they've given citizens a new way to participate in government.

This is a truly groundbreaking story in itself, but it's not the end of the story.

Last June, on Citizen Hack Day in Oakland, where I live, the Code for America team built Oakland Answers from the open source of Honolulu Answers.

I wrote answers to some questions including this one

To this day, I communicate the authority and responsibility I feel where I live. To this day, I communicate the authority and responsibility I feel where I live in these small actions.

I believe that my small participation, which is only possible because of citizen hacking, combined with the actions of thousands of others, can reinvigorate civil rights and restore trust in government.

I'm sure you're wondering what city officials think about this.

It seems like a surprisingly good feeling

As you know, every day the city has to do more with less and is constantly looking for innovative solutions to entrenched problems.

By giving citizens more ways to participate than just attending public hearings, cities can give their communities the power they need to do their jobs.

I don't want you to think that citizen hacking only happens in America.

In fact, it's happening all over the world, and one of my favorite examples is Mexico City. Earlier this year, the Mexican House of Representatives signed a contract with a software development company to create an application that lawmakers will use to track bills.

So this was only for a few members of parliament.So this was only for a few members of parliament.

The deal was a two-year deal for $9.3 million The deal was a two-year deal for $9.3 million

A lot of people were outraged, not to mention the experts who knew that $9.3 million was an exorbitant price for such a simple app.

But instead of protesting in the streets, they tried other ways.

We asked a Mexican programmer to create a better and cheaper app, and offered a reward of $9,300. It took 10 days [Don't just get mad, spend a Saturday night with a tequila and put the world back together – Codeando México]

And in that period [Don't just get mad, have a Saturday night with tequila and let's put the world back together – Codeando México] 173 apps were submitted, 5 of which went to Congress and are still on the app store.

That action voided government contracts and sparked a movement in Mexico City, where our partner, Code for Mexico City, is.

Honolulu, Oakland and Mexico City, what these three cities have in common is the core element of citizen hacking.

They looked at the problems that citizens could improve, and decided to solve them, and in doing so, they created a 21st-century participatory system.

They created a whole new way of civic engagement in addition to voting and petition signatures -- protests.

creating the actual administration

So back to Benjamin Franklin, a little-known accomplishment, he founded the first volunteer fire company in Philadelphia, Briggate, in 1736.

He and his friends realized that it would be difficult to keep up with all the fires that occurred within the city's jurisdiction, so they came up with a solution in the very Citizen Hacker way.

And Code for America has its own chapters working on these projects, and I'm asking you to follow in Benjamin Franklin's footsteps and join us in our work.

There are 31 branches in the US

We are pleased to inform you that we have established our first overseas branch, starting with Poland, Japan and the Republic of Ireland.

Find out if there is a branch in your area at brigade.codeforamerica.org If not, we can help you set it up

brigade.codeforamerica.org has a toolkit we've created to help you get started, and we'll help you get started.

Our goal is to build a global network of civic hackers who can innovate existing systems, create tools to solve entrenched problems, support local governments, and empower citizens.

come hack with me

thank you

(applause)

I work with children with autism

Specifically, we help with communication through technological development.

A common problem faced by children with autism is the difficulty in understanding abstractions and symbolic meanings.

That's why I often struggle with words.

I'll explain in a little more detail.

You know this is a picture of soup, right?

It looks that way and I understand that

Here are two more soup paintings, just more abstract, not as concrete as the first.

When it comes to language, it's now words, and words have nothing to do with what they look like, what they sound like, what that first soup is, what it means.

So it's a completely abstract, arbitrary representation of things in the real world that children with autism have a lot of trouble understanding.

People who work with these children -- speech therapists and educators -- they're trying to help children with autism communicate with pictures, not words.

If a child with autism wanted to say, "I want soup," he would pick three pictures: "me," "soup," and "want."

This method is very effective and has been practiced for the last 30, 40 years.

In fact, I developed an iPad app for this a few years ago, called Avaz, and the way it works is that kids choose different pictures.

The selected pictures are connected to form a sentence, and the sentence is read aloud.

So Avaz is a picture-to-word app, a picture-to-word translator.

the app was effective

Thousands of kids use it all over the world, so I started thinking about what this app could do -- and what it couldn't do.

And then I realized something interesting, Avaz helps me learn words.

Learning word patterns doesn't help

I'll explain in a little more detail

Take "I want to have soup tonight" as an example.

It's not just words that convey meaning here.

How the words are arranged and how they are modified are also important.

That's why "I want soup tonight" is distinguished from gibberish like "I want soup tonight" from gibberish like "I want soup tonight".

Here's another abstraction that children with autism have a hard time grasping: the ability to modify or rearrange words to convey different meanings and ideas.

this is what is called grammar

Grammar is powerful. Grammar is the building block of language that enables us to convey infinite information and ideas based on our finite vocabulary.

It's a mechanism that can connect different things and communicate anything.

After building Avaz, I struggled for a long time with how to teach grammar to children with autism.

I saw the answer from an unexpected point of view

One day, I saw an autistic child having a conversation with his mother, and then...

The child suddenly stood up and said, "Eat."

What was interesting was that the mother was asking the child questions to find out what the child was trying to say.

"What do you want to eat?" "Do you want ice cream?"

"Do you want to eat?" "Does anyone want to eat?"

"Do you want to eat now?" "Do you want to eat in the evening?"

And I was surprised that this mom's actions were genius.

She made it possible to communicate with children without grammar.

I had a feeling this might be the answer you were looking for.

Instead of ordering the words as a sentence, arrange them on a map like this where the elements are connected to each other. Instead of putting the elements side by side, arrange them in question format, that is, in question-answer pairs.

What you're conveying in this way is not the English sentence, it's conveying the meaning, it's the meaning of the English sentence.

Meaning is the vital point of language.

generated after thought and before language

I thought that the map format could convey the meaning directly.

I was so excited, I went to different places and tried to translate every sentence I heard into this form.

Then I realized that this wasn't enough.

What am I missing?

For example, when you want to convey a negative, you say, "I don't want to drink the soup," which cannot be elicited by questions.

I need to change "I want to drink"

If you want to say, "I wanted to drink soup yesterday,"

change to past tense

The system is completed by adding this function

This map of words is linked by question-answer relationships, and can be further filtered and modified for specific nuances.

Let me explain with a different example.

"I told the carpenter I couldn't pay him" "I told the carpenter I couldn't pay him"

it's a pretty complicated sentence

Because the way this system works, you can start anywhere in the sentence.

Let's start with "say"

The word "say" is

Since it happened in the past, I will change this to "I said"

Now let me ask you some questions

"Who said it?" "I said it."

"Who did you tell?" "I told the carpenter."

From the next part of the sentence

Put the word "pay" through an ability filter to make it "can pay."

Then say "I can't pay" and finally "I couldn't pay" in the past tense.

"Who couldn't pay?" "I couldn't pay."

"Who couldn't you pay?" "You couldn't pay the carpenter."

To connect the results, I ask this question, "What did you say to the carpenter?"

"I told the carpenter I couldn't pay him."

Think about it, this is -- (applause) -- this is a representation of a sentence that doesn't rely on language.

and there are some interesting points

First, I could have started with any part.

You don't have to start with "say"

No matter where you start, you'll get the same result.

Second, even if I wasn't an English speaker, and I was speaking another language, the map worked just as well.

Maps are language agnostic, as long as the questions are consistent.

We called it FreeSpeech, and we tried it for months.

try all kinds of patterns

I found a very interesting point

When I was trying to convert words, I was converting English to "free language" and vice versa.

I noticed a peculiar structure, and from this peculiar way of representing language, it was possible to derive a very simple law between the extremes of "free language" and English.

You can actually write out the rules that translate from representation to English.

Developed in this way

It is a "free language" engine. Any "free language" sentence can be input and English sentences with correct grammar can be output.

Combining the two, the representation and the engine, we created an app that was a technology for children with autism that gave them not only words, but grammar as well.

And when we got kids with autism to try it, the effect was immediately apparent.

They were able to use "free language" to create sentences that were much more complex and much easier to understand than English.

I made a hypothesis, and I'll explain it now.

Around 1997, about 15 years ago, a group of scientists trying to figure out how the brain processes language discovered something very interesting.

When humans learn languages ​​as children, they learn them in one part of the brain.

I don't know why, but I think that when you learn a language as an adult, you almost inevitably learn it through your mother tongue or your first language.

What's interesting about "free language" is that when it comes to generating sentences and language -- children with autism, by the way, "free language" make words -- they don't rely on auxiliary language, there's no linguistic bridge.

you are constructing the sentence directly

and an idea came to me

Could "language freedom" also be used to teach language to non-disabled people instead of children with autism?

tried some experiments

First, I made a jigsaw puzzle, where questions and answers were embedded in shapes and colors, and people put it together to understand how it works.

This led me to develop a game app that allows children to learn a language by playing with words, assisting visual structures with auditory support.

This technology has huge potential, and we recently licensed this technology to the Indian government, which will use it to teach English to millions of children.

My dream, my hope, my hope is that by learning English in this way, I will become as fluent in it as I am in my mother tongue.

Then next

Let's talk about utterances

this is an utterance

is the primary form of communication between people

The interesting thing about speech is that it's one-dimensional.

Why one dimensional?

because it's voice

And because the human mouth is designed that way.

Built to emit one-dimensional sound

But when you think about the brain, the thoughts in your head aren't one-dimensional.

Because thought is rich and complex and multi-dimensional.

It makes me realize that language is really an invention of the brain, and it's about translating this rich, multi-dimensional thought into speech.

The interesting thing is that a lot of the work these days is in the information space, but most of it is in the realm of language.

For example google

It combs through countless English-language websites, and when you use Google, you type in English in a Google search and it matches that English with the English of the website.

What if we could do this in "free language" as well?

My guess is that doing so will make the algorithms for searching and retrieving results simpler and more efficient, without having to deal with the data structure of the utterances.

Because it becomes something that processes data structures of thought.

data structure of thought

That's an exciting idea

Let's take a closer look

This is the "free language" ecosystem

On the one hand, there's "free language," and there's an engine that generates English.

If you think about it again, "free language" is independent of language.

No specific information about English

So all the information about English that this system has is encoded in the engine.

this is an interesting concept in itself

We've symbolized human language into software programs.

But when you look inside the engine, it's not that complicated.

it's not hard code

What's even more interesting is that most of the code isn't native to English.

that's where i thought

I wondered if it would be possible to easily create such an engine for a variety of languages, such as Hindi, French, German, Swahili.

From there, we can also consider

For example, let's say I'm a writer for a newspaper or magazine.

If you write content in one language, a "free language," the consumer of that content, the reader of the information, can read the content in their mother tongue on any engine of their choice.

This is a very attractive idea, especially in India where many languages ​​are spoken.

because it exists

A song about India describes the country like this (in Sanskrit):

He says, "Speakers of beautiful languages, always smiling."

language is beautiful

I think it's the most beautiful human creation.

I think it's the loveliest invention of the brain.

They entertain us, they educate us, they enlighten us, but what I like most is that they empower us.

I have one last thing to show you.

Here's a picture of my collaborators when I started working on language and autism.

She is Pavna Mother is Kalpana

Pavna is an entrepreneur, she's only 23, so her story is better than mine.

She has cerebral tetraplegia, and since birth she has been unable to move or speak.

What she's accomplished so far -- completing compulsory education, going to college, starting a company, helping develop Avaz -- all by just moving her eyes.

Daniel Webster said, "If I lose all but one of my possessions, I want to keep my ability to communicate, so I can get the rest back."

And that's why, among the many applications of free language, I still feel that the most important one is to empower children with disabilities to communicate, so that we can take it all back.

thank you

(Applause) Thank you very much (Applause) Thank you very much (Applause) (Applause)

I am very happy to take this opportunity today to talk about the potential for treating brain injuries. I am particularly passionate about this field, and as a neurologist myself, I believe that I can bring hope to patients with brain diseases that are considered serious and incurable.

let's see the problem

Here you see a human brain with Alzheimer's disease and a healthy brain, and the Alzheimer's brain clearly shows atrophy, scarring and other damage in the red circles.

And other brain diseases -- multiple sclerosis (MS), motor neuron disease, Parkinson's disease, Huntington's disease -- all look very similar.

These brain diseases collectively pose a threat to people's health.

I am really overwhelmed by the number

Today, 35 million people have some form of brain disease, and worldwide it costs 700 billion dollars a year.

how

That's more than 1% of the world's GDP.

And it's getting worse, because all these numbers are going up, and brain diseases are generally age-related, and we're living longer.

So what we have to ask is, if the impact of brain disease on individuals is devastating -- if the impact of brain disease on individuals is devastating -- let alone the scale of the social problem -- why are there no effective treatments?

To think about this, I'll first do a crash course on how the brain works.

In other words, I'm going to teach you everything I learned in medical school.

(Laughter) It won't take long.

Is it OK? (Laughter) The brain is really simple. It's made up of four types of cells, two of which are right here.

Nerve cells and myelinated insulator cells—

cells called oligodendrocytes

When the four cells are well functioning, healthy and harmonious, they produce a symphony of electrical signals that support our thoughts, emotions, memories, learning, movement and sensations.

But similarly, if one or all of the four cells malfunction or die, the brain can be damaged.

damaged wiring

communication is interrupted

Conduction delay occurs

As a result, this damage manifests itself as a symptom of disease.

If the neurons that start dying are motor neurons, for example, then you have motor neuron disease.

So I'm going to tell you what happens to real patients with motor neuron disease.

My patient's name is John

I visited the clinic last week.

So I asked John to share his symptoms when he was first diagnosed with motor neuron disease.

John: Diagnosed in October of 2011, the main problem was breathing, and it became difficult to breathe.

SC: Did you notice? John says he found motor neuron disease because of his breathing difficulties. He says he found motor neuron disease.

Now, 18 months after my diagnosis, I asked him to tell me about his current predicament.

John: It's getting harder to breathe

I no longer have strength in my arms and limbs

basically life in a wheelchair

SC: John said he's mostly in a wheelchair.

These two clips show not only the devastating effects of this disease, but also the frightening rate of progression of the disease: in just 18 months, a healthy adult man became wheelchair and ventilator dependent.

John could have been your father, your brother, your friend.

This is what happens when motor neurons die.

What happens when the myelin cells die?

have multiple sclerosis (MS)

The scan on the left shows what the brain looks like, the damaged area overlaid on the connectivity map of the brain, overlaid on the connectivity map of the brain.

This point is called demyelination.

damaged and white

Well, what do you think?

"What, this guy first said he was going to talk about hope, but all he ever really talked about was depressing stories."

As I said, brain disease is a terrifying disease.

It's brought dramatic change, its numbers are rising, its costs are enormous, and worst of all - there's no cure. Is there hope?

no i think there is hope

There's hope in the department of the MS brain that I'm going to talk about, because it shows, amazingly, that the brain is capable of self-repair.

it's just not enough

So I would like to show you two points.

First of all, the damage in this MS patient

about another white part

The light blue area circled in red is the important place

Actually it used to be white

So it's been damaged, but it's been repaired.

Let me tell you, it's not the doctor's power.

Even if there was a doctor's intervention, it's not the doctor's credit.

with spontaneous repair

It's amazing, because stem cells are also present in the brain, so they're laying down new myelin, new insulation, in damaged nerves.

This observation is important for two reasons.

First, contrary to the old wisdom I learned in medical school -- first against the old wisdom learned in medical school -- at least I was taught in the last century that the brain doesn't spontaneously regenerate like bone or liver.

Because it plays like this, it's just not enough.

The second and most important reason is that it provides a clear direction for new therapies, which means that you don't need a hard theory to do this.

We just have to find ways to encourage spontaneous healing from within.

Even though we know this, why is it that, as I said before, there is no established cure?

Partly due to the complexity of drug development Partly due to the complexity of drug development

Developing a drug is considered an expensive, high-risk gamble. The odds of success are about 1 in 10,000. That means we need to test about 10,000 drugs before we manage to develop one new drug.

Even if you spend 15 years and spend more than a billion dollars, there's no guarantee that you'll find a new drug.

Now the important thing is, can't we change the rules of the game to increase this probability?

What are the obstacles to developing new drugs to do so?

One of them is seen in the early stages of drug development.

Screening using animals

As Alexander Pope said, "Man's right research subject is man." As Alexander Pope said, "Man's proper research subject is man."

So the question is, can we use human biomaterials to study disease?

of course it is possible

We use stem cells, we use human stem cells.

Human stem cells are special, but they're also simple cells that can do two things: they can self-renew and proliferate, but they can also differentiate into specific cells -- bone, liver, and all-important nerve cells -- and they can also differentiate into motor neurons and myelin cells.

The challenge is long-lasting: can we harness the undeniable power of stem cells to achieve neuronal regeneration? Can it be used to realize nerve cell regeneration? Can it be used to realize nerve cell regeneration?

I think it's possible now, because in the last 10 to 20 years, we've made some significant discoveries.

One of those discoveries was made here in Edinburgh, about that celebrity, Dolly the Sheep.

Dolly was born in Edinburgh, and Dolly was the first mammalian clone born from an adult cell.

But the breakthrough that's right for today's discussion was made in 2006 by a Japanese scientist, Professor Yamanaka.

What Professor Yamanaka did was an amazing scientific recipe, with just four ingredients, and with just four ingredients, you can turn any adult cell into a pluripotent stem cell, or iPS cell.

This is indescribably important, and what this means, especially for patients, is that we can generate cell repair kits that are custom-tailored to the diseased tissue.

We take skin cells and turn them into iPS cells, and we transform those cells into healthy cells for disease and use them for research and treatment.

In medical school back then—me and medical school are already a familiar theme, aren't they? That thought was crazy, but now it's a reality.

I see this as the first step to regeneration, restoration and hope I see this as the first step to regeneration, restoration and hope

And when it comes to hope, there's hope for those who might have failed school, because this is John Gurdon's report card.

[Wanting to be a scientist is ridiculous]

Who would have thought that three months from now you would win the Nobel Prize in Medicine?

So back to the topic, how can stem cells, this disruptive new technology, be used in repairing damaged brains, in regenerative neuroscience?

I see it in two ways: as a tool for drug discovery in the 21st century and as part of therapy.

I would like to talk a little bit about both.

The search for new drugs in the lab is often described as

It's really simple. Take a patient, say they have motor neuron disease -- take a sample of their skin and reprogram it, as I said earlier, to give it pluripotency and generate living motor neurons.

The reason it's so lean is because it's a pluripotent stem cell.

The key here is to be able to compare their behavior to healthy allogeneic cells, ideally unaffected relatives.

This way we can identify inherited mutations.

this is what we did

Collaborators on this work are C. Shaw from the UK, S. Finkbeiner and T. Maniatis from the US.

What you're seeing here is a really cool growing motor neuron from a patient with motor neuron disease. A growing motor neuron from a patient with motor neuron disease.

It's a form inherited by heredity.

Really

10 years ago it was unimaginable

Aside from the growth process, it's possible to engineer the cells to fluoresce, but the point here is to be able to track individual states and compare injured motor neurons to healthy motor neurons.

If you put them side by side like this, you'll notice that the death rate of diseased neurons, shown by the red line, is 2.5 times higher than healthy ones.

And the important point here is that this is a great analytical metric for drug development, because what we want from a drug -- this kind of data can be processed by high-speed automated screening systems -- is that the only thing we want from a drug is that the red line is closer to the blue line.

Now I want to go back to using stem cells to directly repair damage.

As I said before, there are two ways, but they're not mutually exclusive.

The first one is the one that will give you the best results in the long run, but it's not currently considered viable. As I said earlier, we should focus on the stem cells that are already in the brain.

Our brains have stem cells even when we have disease, so we want to find a way to encourage and activate those stem cells that are already in the brain to respond appropriately to damage and repair them.

in the future actually

Drugs that work that way will be developed.

The other is direct cell-to-cell stem cell transplantation, where stem cells are transplanted to replace dead or lost cells in the brain.

Let me tell you about an experiment, this is a recently completed clinical trial that I did with my colleagues at UCL, primarily David Miller.

This study is simple

It was aimed at MS patients. The question is simple: Do bone marrow stem cells provide neuroprotection? Do bone marrow stem cells protect neurons?

So what we've done is take the stem cells out of the bone marrow, grow the stem cells in the lab, and inject them back into the vein.

it sounds so easy

In fact, it took many people five years

All kinds of challenges appeared in front of me, and my gray hairs increased in five years.

The idea is basically simple

You put the stem cells back into your veins, right?

To determine whether or not we were successful, we measured the optic nerve as an outcome measure.

This is useful for assessing MS because, sadly, people with MS suffer from vision problems such as blindness and poor vision.

We measure the size of the optic nerve from David's images at three times -- 12 months, 6 months, before the injections -- from the gently descending red line.

You can see that the optic nerve is shrinking, which makes sense because the nerve is dying.

After the stem cell injection, we repeat the measurement twice -- three months, six months -- and to our surprise, the line continues to rise.

It shows that the intervention had a protective effect.

I personally don't think stem cells created new myelin, or I don't think stem cells created new myelin or nerves.

I think what the stem cells did was put the endogenous stem cells, the progenitor cells, to work and lay down new myelin.

I was able to show the concept

very excited

And so I'd like to conclude with the theme I first presented: rebirth and hope.

I asked John about his hopes for the future I asked John about his hopes for the future

John: My hope is that sometime in the future, the research you're doing will lead to a cure that will allow people like me to lead normal lives.

SC: You say a lot

First of all, I would like to thank John for sharing his insight and the video.

Let me add to John and everyone else that I have hope for the future.

I believe that disruptive innovations like the stem cells I've described offer real hope.

I believe the day when we can repair our damaged brains will come sooner than we think.

thank you

(applause)

This is an image of a galaxy cluster

exactly as the name suggests

It's a huge collection of galaxies, pulled together by their gravitational pull.

Most of the speckles on the screen aren't individual stars, they're clusters of stars, or galaxies.

When you look at these images, you immediately think that clusters of galaxies are such beautiful things, but there's more to them than that. Clusters are mysterious, amazing, and useful.

It's the largest laboratory in the universe.

And as a lab, when we talk about galaxy clusters, we talk about the experiments that we can do there.

There are four main types of research objects, the first being the exploration of very large objects.

to say how big

This is an image of a galaxy cluster

It's so massive that light passing through it is refracted and distorted by the galaxy cluster's immense gravity.

In fact, if you look really closely, you'll see rings around this cluster of galaxies.

To put the numbers into perspective, this cluster of galaxies is over a trillion times the mass of our Sun.

Its enormity will amaze you

But it's not just mass, it's got these features:

A cluster of galaxies is essentially an isolated system, so you can think of it as a miniature version of the entire universe.

A lot of questions when you look at the universe on a large scale -- a lot of questions when you look at the universe on a large scale -- like how gravity works --

Examining these clusters of galaxies may provide answers.

So much for the big story

The second research is very hot.

If you remove all the starlight from an image of a galaxy cluster, what's left is this big blue blob.

this is not true color

I'm actually looking at x-rays

If this light is not from the galaxy, where is it coming from?

The answer is hot gas, million-degree gas, but it's actually plasma.

I explained in the previous slide why it's so hot.

The strong gravitational pull of galaxy clusters accelerates gas particles to super-velocities, and that velocity creates super-hot gas.

That's the main theory, but research is just beginning.

There are still many things that we do not understand about the various basic properties of plasma, which is a headache.

The third is the exploration of microscopic objects.

To explain this, I have to tell you an astonishing fact.

Most of the matter in the universe is not made of atoms.

it wasn't

Most of it is made of something very strange called dark matter.

Non-gravity and very little interaction, non-gravity and little interaction, and people are interested in it.

If you're a particle physicist, you want to know what happens when you bump things into each other.

Dark Matter—is no exception

So how do you hit this?

To answer that question, let me ask you one more question: What happens when galaxy clusters collide?

here is the image

A cluster of galaxies is like a miniature version of the universe.

It's mainly made of dark matter, and it's the bluish purple part.

Red indicates hot gas, and you can see many galaxies.

When galaxy clusters collide, they act like giant particle accelerators When galaxy clusters collide, they act like giant particle accelerators.

The point is that this may allow us to observe very subtle, very difficult-to-detect effects that are difficult to detect in the laboratory, in a multi-layered and complex superimposition.

It is very interesting

The reason why clusters of galaxies tell us about dark matter — the reason we can see tiny physics in clusters is because they're so huge.

The fourth is the physics of very strange things.

It's certainly strange what we've talked about so far

If there's anything stranger than that, it's dark energy.

If you throw a ball up in the air, you'd think it would go up.

I don't think the rate of rise will accelerate.

Similarly, even if cosmologists understand why the universe is expanding,

We don't know why it's expanding faster and faster.

What causes this accelerated expansion is what we call dark energy.

and i would like to know more about this

In particular, I'm wondering what effect dark energy has on the universe as a whole.

Its strength will change the formation of large-scale structures in the universe.

The problem with the large-scale structure of the universe is that it's frighteningly complex.

this is a computer simulation

should be simplified

I would like to think using a metaphor.

If you want to understand the sinking of the Titanic, the most important thing is not to recreate all the shattered pieces of the ship.

It's about finding the two biggest parts

Similarly, we can learn about the entire universe by tracking the largest pieces, the largest pieces of which are clusters of galaxies.

Having said all this, you may feel like you're being deceived.

So I started by saying how useful clusters of galaxies are, and I gave you the reasons why, but what are they actually useful for?

The answer is in what Henry Ford said when asked about cars, in what Henry Ford said when asked about cars.

He said, "If I had asked people what they wanted, they would have said they wanted a faster horse."

Our society today faces many difficult problems.

the solution is not clear

"Faster horses" are not the answer

The solution requires a great deal of scientific ingenuity The solution requires a great deal of scientific ingenuity

So we need to be committed, but we should also remember that innovation, ingenuity and inspiration happen when we broaden our horizons and step back and look at the big picture.

And the best way to do that is to explore our universe. Thank you.

(applause)

About two years ago I was driving in Germany and I turned on the radio and

Europe was in the midst of the euro crisis at the time, and all the news was about European countries that had been downgraded by the US rating agencies.

When I heard the news, I was like, "What is this rating agency?"

If someone sat next to me and said, "You're going to spend the next few years reinventing a rating agency," I would say, "I'm going crazy."

But what's really funny is the way the rating agencies operate.

I'm going to tell you not just why it's time to change that, but how to change it.

Let me tell you a little bit about the reality of rating agencies.

Just like you read car magazines before you buy a new car, or read product reviews about which tablet or phone to buy, investors read ratings before deciding which product to invest in.

Ratings drop from best performing AAA Ratings down from best performing AAA to BBB-minus levels that are very risky for investment Ratings drop to BBB-minus levels that are very risky to invest in BBB-minus levels that are very risky to invest

Rating agencies evaluate companies

rate the bank

We value even financial instruments with a bad reputation like mortgage-backed securities We value even financial instruments with a bad reputation like mortgage-backed securities

Countries are also rated, and we call them sovereign ratings.

As you listen to me now, I'm sure you're thinking, "Is this something I should worry about?"

To be honest

Every rating affects you

affects everyone

When a rating agency rates a country, it's basically assessing the country's debt and assessing its ability and willingness to repay.

So a downgraded country has to pay more to borrow on the international market, has to pay more to borrow on the international market, and has to pay more to borrow on the international market.

It affects you, the people who pay the tax, because you, the people, have to pay it back.

What if the payment is too big to pay?

The country will cut its budget for roads, schools, health care, etc.

So you should be concerned, too, because everyone is affected by "sovereign ratings."

Sovereign ratings are defined as public goods

Should be publicly available for free to everyone with nothing to hide

But right now, the ratings market is dominated by just three companies: Standard & Poor's, Moody's and Fitch, because when there's market concentration there's no competition at all.

No need to improve product value

As a result, rating agencies are part of the global economic crisis and need to change the way they operate.

The second point is, do you buy a car based solely on the dealer's advice? Would you buy a car based solely on the advice of the car dealer?

Of course not

But that's what happens at rating agencies, actually every day. But that's what happens at rating companies, actually every day.

The customers of these companies -- the countries and the companies -- are paying for their reputation, and this creates a conflict of interest.

And my third point is that these three companies haven't told us how they actually rank them, even though in this day and age, you can't sell a single candy unless you list the ingredients.

We don't know what factors go into ratings, which are a vital part of the economy.

We're letting the company keep their work secret, and this needs to change.

Undoubtedly, this area needs a thorough overhaul, not just a partial fix.

act boldly

I think it's time to improve this system.

That's why we at the Bertelsmann Foundation are spending time and effort to think of alternatives.

We started our first attempt at a non-profit sovereign risk rating agency, INCRA for short.

INCRA brings change to the current system by adding non-profits INCRA brings change to the current system by adding non-profits INCRA brings change to the current system by adding non-profits

Based on a non-profit structure that can be perpetuated by donations Based on a non-profit structure that can be perpetuated by donations

The income from donations will allow us to operate a rating agency, and we will be able to operate a rating agency, and we will be able to publish our ratings.

Isn't that enough?

INCRA has a very clear governance structure that avoids conflicts of interest and embraces the diverse stakeholders of society.

INCRA will not be just a European or American rating agency, but an international one, especially for emerging economies, as a level playing field for concerns and opinions.

The second big difference with INCRA is that the sovereign risk assessment is based on a broader set of indicators.

think about something

So basically when we do a sovereign rating, we look at the economic soil of the country -- the macroeconomic fundamentals.

But the question is, who is cultivating the economic soil of that country? don't you

There are a lot of gardeners in the country, and one of them is the government, so what you need to know is how the country is governed.

how it is run

That's why we developed what we call "foresight indicators." This is why we developed what we call "foresight indicators."

This indicator gives a good picture of the socio-economic development of a country. This indicator shows a good picture of the socio-economic development of a country.

Is the government active in investing in renewable energy and education? Is the government active in investing in renewable energy and education?

I think you'll agree that it's important to know whether we can survive the crisis, whether we can survive the crisis, and whether the government can deliver the reforms it promises, and so on.

For example, when INCRA evaluates South Africa, one of the things that we often look at is the national youth unemployment situation, which has the highest unemployment rate in the world.

More than 70% of people under 35 are unemployed. More than 70% of people under 35 are unemployed. Of course, this has a big impact on the economy, but it will have an even bigger impact in the future.

Our friends Moody's and Fitch Standard & Poor's will say they take this into account as well.

But I don't really know how they think.

This is INCRA's third big difference. This is INCRA's third big difference.

INCRA not only publishes its ratings, but also publishes the methods and the factors that guide them.

Unlike today's system, INCRA keeps nothing secret.

In a nutshell, INCRA will replace the current system of three big companies and provide an amalgamation of new non-profit players that will drive competition, transparency and quality in the ratings industry.

Sovereign ratings may seem like a small part of a very complex global financial world, but they are very important, and they are very important things to improve.

And that's why we're trying to find people who are capable and willing to bring INCRA to life by testing our model now.

I believe that building INCRA will benefit all of us. Now is a unique opportunity to make INCRA a cornerstone of a more inclusive financial system. Now is a unique opportunity to make INCRA a cornerstone of a more inclusive financial system.

Because for too long, important financial companies have been left unchecked.

Now is the time to add another friend to the mix.

thank you

(applause)

I'd like to talk a little bit about strategy as it relates to technology.

When you think about business strategy, you think of it as an abstract object with essentially economic concepts, and you don't think about time horizons.

But I think that business strategy can always be based on technology, but the premise is changing.

First, let me tell you a little bit about its history.

The concept of business strategy can be traced back to two great intellectuals: Bruce Henderson, founder of BCG, and Michael Porter, of Harvard Business School.

A core part of Henderson's idea was what you might call a Napoleonic idea: outnumbering the weak.

What Henderson understood is that in the business world, economic phenomena are what economists argue are "increasing returns" with scale and experience.

It means that if you do more economic activity, you get more than proportional rewards.

So we found the logic of investing in sheer numbers to gain a competitive edge.

This was essentially the first introduction of the concept of military strategy into the business world.

Porter not only agreed with the idea, but improved it.

He correctly pointed out that while this strategy works, there are actually multiple steps in business to get there.

There are several different factors, and each factor may require a different strategy.

A particular company or way of doing business may be favorable in one economy and unfavorable in another.

He coined the concept of the value chain, which is essentially a process of production where raw materials become parts, which are then assembled into products and then distributed. What he argues is that the advantage is that the individual elements stack up, and the overall value is measured by the sum or average of the elements.

And in his idea of ​​the value chain, the premise was that the business was optimized by adjusting the cost of transactions, and it was essential that the organization could do this more efficiently than the market. So often in partnerships between operators, the nature, the role, the boundaries are defined by the transaction costs.

These two ideas, Henderson's concept of "increasing returns" to scale and experience, and then Porter's conception of the value chain, which encompasses many different elements of the overall business strategy landscape, have formed.

What I want to discuss here is the fact that these assumptions are becoming invalid.

First, let's consider transaction costs.

Transaction costs have two components

One is processing information, the other is communication.

The fact that processing and communication have evolved to this point over time is a result of their own economics.

As you know, in many ways, these factors have changed dramatically since Porter and Henderson first proposed the theory.

Especially since the mid-'90s, the cost of communications has been falling faster than the cost of transactions has fallen, and that's why communications, the Internet, has spread so dramatically.

These reductions in transaction costs have important consequences, because if transaction costs are what binds the value chain together, the lower they are, the less room there is for further reductions.

And that reduces the need for vertical organisations, and even splits the value chain.

I'm not saying it should be, but it's possible.

In particular, what can happen is that one of the competitors in one business can take advantage of its position at one step in the value chain, and at another step it can take over the competitor's position, act hostilely, or invest without a middleman.

This is not just a conceptual proposal

In fact, there are many such cases

A classic example is the business of encyclopedias.

The encyclopedia business in the era of leather-bound books was basically a distribution business.

The main cost was the commission to the salesperson

With the advent of CD-ROMs and the Internet, new technologies made the cost of knowledge distribution cheaper by orders of magnitude, and the encyclopedia business collapsed.

By now, of course, it's very well known.

This was common in the first generation of Internet businesses.

As the cost of transactions has fallen, the value chain has become fragmented, so direct trade is possible, and what we call "deconstruction."

One of the questions I get asked often is, what will replace the encyclopedia business now that the Britannica business model is no longer viable?

It took a while for the answer to become clear.

Wikipedia, as we all know

What makes Wikipedia special isn't how it's distributed.

What makes Wikipedia unique is the process by which it is created.

Wikipedia is, of course, an encyclopedia, but it's created by users.

This could be called the second decade of the Internet economy, when the Internet became a verb rather than a noun.

We're in an age where conversations can take many forms, users create content, and social networks are all the rage.

What this means is that a kind of "economies of scale" in the Porter and Henderson paradigm has broken down.

What it turns out is that tens of thousands of individuals have independently built encyclopedias, doing the same level of work for much less than professionals in hierarchical organizations.

Basically, what's happening here is that one layer of the value chain has been torn apart, replaced by individuals, and the organization is no longer needed.

But as this graph makes clear, another question arises. So far we've looked at the first and second periods, but what's different about the third period?

What I'm going to discuss is exactly the "something" that characterizes the third period, and that's what puts the Porter-Henderson theory I've been talking about in a new frame.

it's about the data

All the way back to the year 2000, people were talking about the information revolution, and in fact, the data was accumulating -- it was accumulating at a tremendous rate.

But at this stage, analog data still dominates.

Fast forward to 2007. Not only has the accumulation of data exploded, but analog data has been replaced by digital data.

And more importantly, if you look at the graphs more carefully, you'll see that about half of the digital data, whether it's a server or a personal computer, has IP address information attached to it.

Whether it is a server or a personal computer, IP address information is added.

Knowing the IP address is associated with other data with the IP address, so

So we're going to be able to collect half the world's knowledge, and we'll be able to analyze the patterns.

Now, if we go back in time to the present, it's probably like this

i don't know the exact number

Fast forward to 2020, and thanks to IDC, of ​​course, we have the exact numbers.

It's interesting that we know better about the future than we do about the present.

What this means is that hundreds of times more accumulated data is associated with IP addresses.

If the number of combinations of information connections is proportional to the number of pairs in the data, then if the amount of data increases by a factor of 100, we can find about 10,000 times more patterns in the data.

I would like to say that this is a dramatic change, a profound change, in the economy of the world in which we live.

When the first human genome, James Watson's genome, was sequenced as the ultimate product of the Human Genome Project in 2000, it cost 200 million dollars and took 10 years to complete a single human genome.

Since then, the cost of analyzing genomes has fallen.

The cost reductions over the last few years have been pretty dramatic. We're now under $1,000, and there's a strong projection that we'll be under $100 by 2015. Over the last 15 years, the cost of sequencing genomes has dropped by five to six orders of magnitude. Over the past 15 years, the cost of sequencing genomes has dropped by five to six orders of magnitude.

At a time when genome sequencing was costing $1 million to $10,000, this was really a research enterprise.

Scientists representing a variety of disciplines got together and tried to generalize abstract patterns of human traits and diseases from a select few people about human traits and diseases.

But once the genome can be analyzed for 100 dollars, wait a little longer, and at 99 dollars, the analyzer becomes available to everyone.

used in all hospitals

When you go to the hospital with a cold, if they don't have the data yet, they'll first analyze your genome. At this point, the doctor uses the abstract knowledge of genomic medicine to see if it works for you -- instead of trying to find a prescription that's tailored to your genome.

Consider the possibility of this

What kind of avenues will open up? Genomic data, clinical data, data on interactions with drugs, and even environmental data measured by phones and medical sensors, will be collected and connected one after another.

If you collect all of this data and put it together, you may find patterns that you haven't seen before.

It may take time, but there may be a revolution in medicine.

it's great a lot of people talk about it

But there's one thing that hasn't been noticed

Is a model of inexorably connecting different databases compatible with the business model of today's business-related organizations, institutions, corporations?

Can these companies and organizations, whose businesses rely on their proprietary data and whose strengths lie in data, continue to create value backed by technology as they have in the past?

Essentially what's happening -- genetic engineering is just one example -- technology is allowing the scale of business to naturally scale beyond the organizational boundaries that we're used to thinking about within it.

The basic trend is that vertically integrated organizations, accustomed to competing in an oligopolistic market of sellers, with similarly shaped competitors, somehow evolve from being vertically connected to being a horizontally spread business.

Why is that happening?

Because transaction costs are falling and size is polarizing.

Lower transaction costs weaken the value chain and encourage fragmentation.

On the side of the polarizing smaller economies of scale -- small is beautiful -- scalable communities can replace traditional corporate production.

Conversely, the direction of scale, symbolized by big data, creates new types of organizations that achieve new scales in the structure of business.

But anyway, the typical vertical structure morphs into a horizontal one.

This reasoning is not limited to big data

If you look at the telecommunications industry, for example, you'll find a similar situation with optical communication technology.

In the pharmaceutical industry, which in this case involves university research, the exact same thing can be said about so-called "big science."

It's the other way around, but if you look at the energy sector, you're talking about each household as an efficient producer of green energy and an efficient saver of energy.

It's a fragmentation, where the very small supersedes the typical large company.

In any case, there will be a horizontalization of the industrial structure, and this will mean a fundamental change in the way we think about business strategy, a fundamental change in how we think about business strategy.

So what we have to think about is, for example, business strategy as creating this kind of horizontal structure, and redefine the definition of business, or even the definition of industry, as a result of business strategy, not as a premise of strategy.

And the problem we have to solve is, for example, how to balance cooperation and competition at the same time.

in the case of the genome

We have to deal with the problem of big data and individual application at the same time.

The structure of the industry must be able to accommodate very different motives, from amateur interest in the community to social motives, such as infrastructure being built by governments, or companies that are normally in competition may co-found organizations because that's the only way to scale.

Such a transformation renders the assumptions of traditional business strategies obsolete.

takes you into a whole new world

What is needed here is a radically different way of thinking about the structure of business, whether public or private, and business strategy will finally become interesting again.

thank you very much

(applause)

Ever since I had brain surgery 18 years ago — I've been obsessed with brain science.

i am a technician

I recently joined Google's Moonshot Project, where I'm in charge of the display division at X Labs, and the research I'm going to talk about today was earlier, outside of Google.

Now, having brain surgery carries a certain stigma.

So you're not going crazy —

If it's gone bad, can I get it back?

I had neurosurgery and lost part of my brain, so I had to deal with it.

It wasn't the gray matter that was lost, but the crusty area in the center that makes important hormones and neurotransmitters.

As soon as I had the surgery, I had to take it every day -- there were more than a dozen different drugs, and I had to individually decide how much to take, because if I didn't take them, I would die in a matter of hours.

For the last 18 years, every single day, I've made decisions about drug combinations and formulations, and tried to understand them in order to live.

I faced danger many times

But luckily, I'm an experimenter at heart, so I decided to keep experimenting to find the optimal dosage, because there was no clear guideline for dosage.

After trying different formulations, I was surprised to find that even the slightest difference in dosage can dramatically change the way you feel about yourself, the way you feel about who you are, the way you think, the way you behave towards others.

One thing that really struck me was that, for two months, I was on a dosage that's typical of a man in his early 20s.

(Laughter) I became irritable all the time, and I thought so much about sex that I thought I was the greatest genius in the world.

mine was a little extreme

The only thing that surprised me was that I didn't mean to take a big stance.

In fact, I was just trying to solve the problem in front of me with anxiety, but it didn't show up in action.

out of my hands

I changed my dosage

This experience helped me understand what men go through, and since then I've been getting along better with men.

My goal was to modulate my hormones and neurotransmitters so that I could regain my intelligence and my creativity -- and my idea flow -- through illness and surgery.

Imagery was important because I usually think in images, so it's a way to recapture the imagery, a way to envision ideas, to try out new ideas, to play out scenarios.

This way of thinking is not new

Philosophers like Hume and Descartes Hobbes saw things similarly.

They equated mental images with ideas.

There's a lot of opposition to this idea today, and there's a lot of debate about how the mind works, but I keep it simple: for most of us, imagery is at the heart of our original and creative thinking.

Over the years, I've adjusted myself and regained a lot of sharp images that have a fairly sophisticated analytical basis.

What I'm working on now is a way to get the image that's in my head right onto my computer screen.

Can you imagine? A filmmaker can visualize the world in front of them just by imagining it.

A composer can get music directly out of his head.

It opens up huge possibilities for creative people to share ideas at the speed of light.

The final obstacle to achieving this is increasing the resolution of brain scans.

I think we're close to doing it, and I'll tell you why, based on two cutting-edge neuroscience studies.

They both use fMRI, or functional magnetic resonance imaging, to visualize the inside of the brain, and this is a set of scans by Georgio Gannis and others at Harvard.

The left column is a brain scan of someone looking at an image --

In the middle is a scan of the same person imagining that image.

The right column is the difference between the left and middle images, and you can see that there is almost no difference.

When I repeated this experiment with many people, using different images, I always got the same results.

There's little difference between seeing an image and imagining that you're looking at that image.

I'd like to introduce you to another experiment, Jack Gallant and others at the University of California, Berkeley.

I've succeeded in decoding brain waves and converting them into images.

Please look

In the experiment, subjects watch hundreds of hours of YouTube videos while simultaneously scanning their brains and storing a huge library of how their brains react to the video footage.

A new set of scans is recorded when a new video with a new image, person or animal is played.

Using only brain scan data, a computer analyzes each new scan and infers what the person is actually seeing.

On the right is what the computer inferred, and on the left is the video that was actually played.

this is really amazing

I've come this far

just increase the resolution

What I want to make sure is that when you actually see the image and when you imagine it, you get the same scanned image.

This was scanned on the highest resolution system available today, and resolution has improved a thousand times over the last few years.

To see more detail, you need to increase the resolution by a factor of 1000.

How do we achieve this?

there are various techniques

You can also split the skull and insert the electrodes,

can't agree

New imaging techniques have been proposed one after another, and I've developed some of them, but given the recent successes of MRI, there's something that needs to be considered: Has the technology's progress reached its limits?

In general, it is said that increasing the size of the magnet is necessary to increase the resolution, but even if the size of the magnet is increased, the resolution will increase only gradually, and it will not reach the necessary thousand times.

So I thought, instead of making the magnet bigger, why not improve the performance of the magnet?

In the field of nanoscience, there are a series of technological breakthroughs, and when applied to magnetic structures, we can create completely new magnets. Using magnets like this, we can capture detailed magnetic field patterns throughout the brain. Using these magnetic field patterns, we can create holographic-like interference structures, and by shifting them, we can precisely control different patterns.

With a little rearrangement, you can draw more complex structures, like a toy that spins gears to create patterns.

So why is this important?

For many years, attempts to improve MRI have been directed toward making the magnets larger.

On the other hand, the reason the resolution has improved in recent years is because of innovations inside the MRI system, in the way the FM radio waves are encoded and decoded in the transmitter and receiver.

And instead of using a uniform magnetic field, let's use a combination of structured magnetic patterns and FM radio waves.

Combining the processing of magnetic patterns with the frequency patterns of FM radio waves dramatically increases the amount of information that can be extracted from a single scan.

Combining this information with our rapidly evolving knowledge of brain structure and memory gives us the thousandfold resolution we need.

With fMRI, we'll be able to directly measure not only the amount of blood flow, including oxygen, but also hormones and neurotransmitters -- even neural activity.

We will be able to put our ideas directly into digital media.

Can you imagine communicating directly with your thoughts, not through language?

What will be possible then?

How do we learn to work with raw thoughts?

the internet will make a lot of sense

this is a big challenge

It may be an essential tool for expanding your thinking and communication abilities.

In fact, this tool may be the key to treating diseases such as Alzheimer's disease.

we have no choice but to move in this direction

It doesn't matter how many years it takes. Five years or 15 years?

But I don't think it will take that long.

We have no choice but to find a way to go down this path together.

thank you

(applause)

Thank you for decorating your colleague's photo

(Laughter) I'm going to tell you about them.

But before that, an experiment, which I don't usually do because I'm a theorist.

What happens when you press this switch?

Okay, well, I used to study elementary particles.

What happens when you make it as detailed as possible?

What is it made up of?

The laws of elementary particles apply to all things, and they are deeply related to the history of the universe.

The four powers are well known. There should be more, but the range of power is so small that we don't really recognize their existence yet.

And here's what I want to talk about the most: a finding in the field of fundamental physics, that beauty is the surest criterion for choosing the right theory.

Why?

this is my real experience

something very dramatic happened

In 1957, three or four colleagues proposed a partial but complete theory of one of the forces, the weak force.

But this theory didn't agree with seven experimental results -- no less than seven.

But the experimental results were all wrong.

We published the results without knowing the results, because we thought they were right because they were so beautiful.

The experiment was supposed to be wrong and it was.

Our colleague Albert Einstein didn't listen very much when he said, "We've got experimental results that don't satisfy the special theory of relativity.

It's D.C. Miller. ' he replied, 'it'll go away' (laughter). Why does it work? that's strange

What does beauty mean? it's just one thing

I'm going to clarify this in part.

Why does it work? Is it related to humans?

To answer the latter, it has nothing to do with humanity.

Somewhere else on another planet orbiting a star far, far away -- perhaps in another galaxy -- there's life on the planet that's as intelligent as we are, and I'm interested in science.

Maybe we're just not close enough to meet

presumed to exist normally

I think the sensory organs are quite different.

It has seven tentacles, 14 small, oddly shaped compound eyes, and a brain that looks like a biscuit.

Are there different laws there than on Earth?

A lot of people believe that, but it's completely ridiculous.

There are laws in the world, and no matter how much time you have, you will never fully understand them.

Someday, mankind will find a fundamental unified theory of elementary particles and forces, and that's what we call the "fundamental laws."

It's not that far off

We may not meet in our lifetime, but we believe that it exists somewhere, and we continue to strive to get closer to it.

i think it's important

When expressing this mathematically

To be very concise, to be very clean in terms of mathematical notation, not complicated, is what beauty and grace means.

This is what I was talking about about the basic laws, the basic laws are real.

Newton was convinced

And he said, "It is the task of natural philosophy to find such laws."

Let's make a few assumptions about the basic law

Suppose that the fundamental laws take the form of a unified theory that spans all elementary particles

Some call it the theory of everything

Wrong, because the theory is quantum mechanical.

I won't go into the details of what quantum mechanics is.

Either way, you'll hear a lot of misconceptions about it. (Laughter) There are a lot of mistakes in movies.

The point is that quantum mechanics measures possibilities.

In some cases it can be said that it is almost certain

In most familiar examples, this is often the case.

It could be different. We only know the possibility of different outcomes.

In other words, the history of the universe is not determined by basic laws alone.

In addition to the basic laws, there's a series of incredible coincidences, products of chance involved.

The basic law does not consider the product of chance, chance is additive.

That's why it's not a theory of everything. Even in reality, the vast amount of information surrounding this universe is a product of chance, not derived from basic laws.

It's been said a lot, but when you look at phenomena at low energy, high energy, super-high energy, in order, or at closer and closer distances, and you get closer and closer to the basic laws, it's like peeling the skin of an onion.

While continuing that, create a more powerful elementary particle accelerator

We're looking more closely at the structure of elementary particles, and in doing so, we're getting closer and closer to the basic laws.

And as you peel the onion like that, as you approach some basic laws you haven't seen yet, you'll realize that every skin has something in common with the skin before and after it.

it needs to look like

This is worth noting, and that's what I want to say today.

Newton is - by the way, Newton is over there.

This is Albert Einstein Hi Al! Newton said, "Nature is aligned with herself," likening nature to a woman.

A new phenomenon, a new skin, a slightly smaller inner skin that appears when you peel an onion, is similar to the larger skin.

The mathematical notation that represented the previous skin is almost identical to the mathematical notation required for the next skin.

That's why the equation looks so simple.

because it makes use of mathematical notation that we already know

Let me give you a simple example: Newton discovered the law of gravity, which is proportional to the square of the distance between two bodies that attract each other.

Coulomb of France discovered the same law of charge.

An example of similarity

When I was studying gravity, I discovered a law

I was looking into electricity and discovered the same law.

a very clear example

There are many more specialized examples

Symmetry is very important here

As you probably know, a circle, for example, has rotational symmetry around its center.

Rotating the circle around its center does not change

In the 3D case, no matter how you rotate the sphere around its center, it doesn't change.

this is the symmetry

It is generally said that there is symmetry when a phenomenon does not change even if a certain operation is performed, and the notation does not change.

Maxwell's equations are, of course, symmetric for any rotation in space.

There is no effect even if the entire space is rotated by a certain angle.The phenomenon does not change electromagnetically or magnetically.

In the 19th century, a new notation emerged to express this, which makes this equation much more concise.

Einstein used a special theory of relativity to explore the symmetry of Maxwell's equations, which is special relativity.

Such symmetry makes this equation even shorter and more beautiful.

Please see, it's okay if you don't understand the meaning

Just look at the shape. (Laughter) Just look at the shape.

What's written at the top is an equation that uses the three components x, y, and z to represent the three directions in space.

Using vector analysis and rotational symmetry, we get the equation in the middle.

It's even more concise if we take advantage of the symmetries of special relativity.

The higher the symmetry, the clearer the simplicity and beauty of the theory can be expressed.

The first of the two equations at the bottom shows that all electromagnetic fields are produced by charge and current.

The second equation shows that the magnetic field alone cannot exist.

Only magnetic fields come from electric charges and currents.

At some point, this theory will have some contradictions.

I'm fine for the time being

In fact, there's a surprising development that most people don't know about.

You should know, but I'm too lazy to go into all the technical details, so I'll just say no. (Laughter) Yang Zhenning, aka Frank Yang, and -- (Laughter) Bob Mills generalized Maxwell's equations 50 years ago by exploiting new symmetries.

a whole new symmetry

It's mathematically similar, but it has a completely new symmetry.

They hoped that this would somehow help particle physics, but it just didn't.

But a colleague of ours generalized this even further, and it turned out to be useful.

It expresses strong and weak forces very beautifully.

So to repeat what I said earlier, every onion skin looks like the skin next to it.

The mathematical notation for the next skin is very similar to what is required for the next skin.

That's why it's beautiful, because I already know how to write it cleanly and accurately.

The theme is that we believe in the existence of a unified theory that underpins all order.

A step toward unity leads to simplicity

Symmetry leads to simplicity

There is a self-similarity that goes from one onion skin to another across size differences.

It's self-similarity in close proximity, and that's what makes this phenomenon.

So we can say that beauty is a good criterion for choosing the right theory.

Newton said, "Nature harmonizes and resembles itself."

One of the things he thought was obvious today, but it wasn't obvious in his time.

I'm not sure if it's true, but there's a story that's often told

I have four sources. When the plague broke out in Cambridge, he visited his mother's farm because the university was closed, and then saw an apple fall from a tree onto his head or somewhere.

It dawned on me that the force that pulls an apple toward the earth might be the same force that controls the motion of the planets and the moon.

It's taken for granted now, but at the time it was an important unity.

same as the law of gravity

He calls this law of nature harmony. "This law of nature is so far removed from the thought of philosophers that I refrained from explaining it in that book, just to avoid being seen as an outrageous eccentric—"

"Because I don't want readers to have the preconceived notion that everything in the book is questionable."

No one would say it's just a fancy idea right now, right?

The force that makes an apple fall to the ground is the same force that spins a planet or a moon, and we all know that's the nature of gravity.

It's not just in the mind. The human mind can appreciate it, it can be enjoyed, it can be used, but it didn't come from the mind.

it's derived from the nature of gravity

it applies to all

That's the nature of the basic law.

That's the basic law, because onion skins are similar to each other, and that's why we can use the mathematical notation for one skin to describe the phenomenon of the next skin in a beautiful and concise way.

Newton accomplished many things that year, including gravity, the laws of motion, calculus, and the set of colors in the rainbow becoming white.

I could have written a wonderful essay about "What I did during summer vacation"

(Laughter) We don't have to think of these principles as separate metaphysical assumptions.

These are derived from the basic laws

called emergent properties

you don't need more to get more

that is the meaning of emergence

The origin of life involves many coincidences in physical and chemical processes.

The human mind is born through neurobiology and a lot of chance, and so chemical bonding is created through some kind of chance in physical processes.

The realization that it's a combination of more basic elements and chance doesn't make these subjects less important.

That's the big principle, and it's very important to realize that.

you don't need more to get more

Readers of my book "Quarks and Jaguars" always ask me, "Is there anything better than what's available?"

You're probably talking about something supernatural.

(Laughter) It's not like we need more to explain something more.

Thank you. (Applause)

The Arab Spring of 2011 caught the attention of the world.

Dictatorships in other countries also took notice, probably fearing that the rebellion would spread.

Since the Arab Spring, activists, journalists and dissidents have been subject to increased surveillance for fear of revolution in their own countries.

A prominent Bahraini activist says he was arrested by his own government, tortured, and shown his personal call and email logs by investigators.

Of course, as we all know, governments can intercept phone calls and emails.

That's why many activists, among other things, avoid using the phone.

I use Skype etc. instead because I don't think there is a risk of being intercepted.

they are wrong

Over the last few years, there's been an industry of companies providing surveillance technology to governments, specifically technology that allows governments to gain unauthorized access to the computers of surveillance targets.

Instead of hacking into phone lines and eavesdropping on phone calls, people now hack computers, turn on webcams and microphones, and steal information from computers.

When the Egyptian regime collapsed in 2011, activists broke into the secret police station and seized dozens of documents, among which they found this document from Gamma Corporation.

Gamma is a German company that makes surveillance software and supplies it exclusively to government agencies.

Remember, most government agencies don't have these technologies.

With a small government, you don't have the resources, you don't have the expertise, and that's why Western companies are so happy to create markets like this, to offer their goods and technology, and get paid for it.

Gamma is just one of those companies.

Let's just say that the Egyptian government didn't actually buy Gamma's software.

Gamma has sent quotations to the Egyptian government, but has not purchased anything.

The Egyptian government appears to have used a trial version of Gamma's software.

(Laughter) This video is part of a commercial for Gamma.

It's a relatively well-executed presentation that actually emphasizes that the police can sit in an air-conditioned police station, sit in a chair, and remotely monitor their targets completely unnoticed.

No webcam light

You don't even have to worry about your mic working.

This is the CEO of Gamma Corporation.

I'm Martin Munch

There are many photographs of Mr. Munch

this is my favorite

try zooming in on his webcam

A small sticker is pasted to cover the camera.

He, of course, knows what kind of surveillance is possible, and he doesn't want to be surveillance.

Munsch says surveillance software is for tracking terrorists and pedophiles.

Of course, you also know that once the software is sold to the government, there's no way to know how it's going to be used.

Gamma's surveillance software, installed on servers in different countries around the world, has tracked many truly atrocious records and human rights violations.

Gamma's software can be bought anywhere in the world.

It's not just Gamma, as I said earlier.

Surveillance technology business market is 500 billion yen

An Italian company called Hacking Team is also a giant in the surveillance technology industry.

The Hacking Team's presentation is probably the best

Hacking Team's videos are very sexy. I'm going to show you one scene for reference. I think you can get a sense of not only the capabilities of the software, but also how it's marketed to government customers.

Narrator: If you want to track your target

(Music) Unauthorized access is the only way

[Browsing the web, submitting documents, sending and receiving emails, and crossing borders] We have no choice but to control more platforms

[ Windows, OS X, iOS, Android Blackberry, Symbian, Linux ] Decrypt the code and get the relevant data

[Skype, encrypted calls, target location, sending and receiving emails, relationships, web browsing, audio and video] Covertly and without a trace.

[ Covert collection infrastructure unaffected by any defense system ] Adopted all over your country

[ Hundreds of thousands of targets can be managed in one place ] This is our technology

It would be laughable if it wasn't real, but the truth is that governments around the world buy Hacking Team's software.

Last year, we learned that the Moroccan government used this software to track Moroccan journalists.

used in many countries

Hacking Team is also aggressively pitching to U.S. law enforcement agencies.

Around last year, Hacking Team opened an office in Maryland.

He also hired a publicist.

He appears to be a frequent participant in surveillance industry conferences, including law enforcement officials.

I also speak at conferences

What struck me most was that Hacking Team sponsored an intermission at a meeting of law enforcement officials early last year.

I don't know if the United States actually bought Hacking Team's technology, but if they didn't, it wouldn't be because Hacking Team wasn't pushing hard enough.

As I said earlier, governments that don't have the resources to build their own surveillance systems buy off-the-shelf software, so it's possible that both the Tunisian government and the German government used the same software.

The government buys what it can get easily

The FBI in the United States has the budget to build its own surveillance technology, and for several years I've been investigating how the FBI gains unauthorized access to target computers.

Here's a picture of a friend of mine who is a member of the Electronic Frontier Foundation, a nonprofit organization, and they've got hundreds of documents about the FBI's next-generation surveillance system.

Most of the documents were covered up, but if you look at this slide, I'm going to zoom in, it says Remote Operations Department.

Now, when I first saw this, I didn't know there was a section like this.

I've been working on surveillance for over six years.

i had never heard of

So I did some searching on the internet, and I ended up on LinkedIn, and finally I was able to get the main line.

Many former U.S. government agency employees who had worked in the Remote Operations Division signed up, and their bios detailed the work they did in their surprising previous jobs.

(Laughter) I passed this information on to a trusted acquaintance at the Wall Street Journal, and she was able to get in touch with several former law enforcement officials about the matter, and was able to confirm that the FBI does indeed have a team whose only job is to gain unauthorized access to surveillance target computers.

Like Gamma and Hacking Team, the FBI had the ability to remotely activate webcams and microphones, steal documents, and even steal web browsing history.

Government compromise creates a big problem: terrorists, pedophiles, drug traffickers, journalists, human rights activists all use the same computers.

There are no phones for drug traffickers, no laptops for journalists.

We're all using the same technology, which means that governments can hack a bad guy's computer and at the same time gain unauthorized access to ours.

Government agencies around the world are using this technology.

It's not really discussed, but it embraces unauthorized access as a legitimate tool.

In the United States, where I live, there have been no congressional hearings on this matter.

No law has been enacted to justify unauthorized access technology, and given the power of this technology and the threat of abuse, it is imperative that the right information be publicly debated.

thank you

(applause)

it was 1800

Intriguing inventions are born and people talk about them.

"Microscope"

Microscopes have made it possible to see microbes that are invisible to the naked eye.

This led to medical discoveries, as many of these microbes were found to be responsible for causing terrible illnesses in people.

Just imagine how society reacted to this discovery. Mrs. England was eating a teacup of this monstrous soup with monsters in it, not far from here in London.

200 years later

We still have this monster soup, and it's taking over tropical developing countries.

Malaria alone kills millions of people each year and billions of people need testing because there are many different types of malaria infections.

It's actually pretty easy to figure out what these monsters really are.

First, we'll stain it, using acridine orange stain, fluorescent stain, Giemsa stain, and so on, and then we'll look at it under a microscope.

then you'll know something

So why would Alex in Kenya, Fatima in Bangladesh, Navjuut in Mumbai, Julie and Marie in Uganda wait months to be diagnosed with the cause of their illness?

That's mainly because current diagnostics just can't get that far.

remember there are a billion people

the problem is in the microscope

Despite being the pinnacle of modern science, research microscopes were designed for the field.

It wasn't designed for diagnosing disease.

So microscopes are heavy, bulky, difficult to maintain, and very expensive.

This is Mahatma Gandhi, taken in the 40's, at the Sebagram monastery in India, where he was being tested for tuberculosis using the exact same microscope that we use today.

My students, Jim and James, traveled to India and Thailand to think deeply about this issue.

There was a variety of donated equipment,

There was mold growing on the microscope lens.

Even if I had a microscope that I could use, I didn't even know how to turn it on.

And out of this research and visits came the idea of ​​the origami microscope.

What is an origami microscope?

The origami microscope is a very practical microscope, and the idea is to make it possible to make microscopes necessary for inspection, such as fluorescence, brightfield, polarized projection microscopes, etc., simply by folding paper.

Do you think that is possible?

Now let's see it in action.

At first, it is a piece of paper

Here you'll find all the components you need for a practical brightfield fluorescence microscope.

It has three parts: the optical part, the lighting part, and the mechanical part.

At the very bottom are micro-optical lenses embedded into the paper itself.

So what you do is you pick it up, and it's kind of like playing with a toy, because that's what it is.

There are no words or explanations written on this paper.

They're marked with colors, so you can fold them to make a microscope.

When it's finished, it will look like this. It has all the features of a standard microscope, including the XY stage.

I didn't want to change it here, because it's been the standard for many years, and many people in the medical community are used to it.

Here we've changed it, but the standard staining method is still used to diagnose a variety of diseases.

insert this

There's an XY stage, and you can focus, and there's a flexure built into the paper that allows you to move the lens and adjust the focus by microns.

What's interesting about this microscope -- when I do this, students don't like it, but they do it -- the interesting thing is that it's sturdy.

Even if I drop it on the floor with the switch on and step on it as hard as I can

It's okay, because it's made of a very flexible material, like paper.

And here's another interesting thing, and this is what you're actually getting sent with diagnostic equipment, and in this envelope you'll find 30 different origami microscopes in different configurations, all in one file.

choose one appropriately

This one is for malaria diagnostics only, and it has a special fluorescence filter embedded for malaria diagnostics.

And that's where the idea of ​​making microscopes specifically for specific diseases was born.

So far, you haven't seen what these things look like.

So -- if you just dim the lights a bit, you can see that this origami microscope also has a projection function.

I'm going to use these two microscopes to project it onto the back wall, and when you project it, you can see what you see through the microscope.

What you're looking at -- (Applause) -- this is a cross-section of the compound eye.

You can see from the cross-sectional pattern how the compound eye lenses are combined.

Another example. My favorite bug. I love to hate this. Mosquitoes.

here

I can do this with the simple things I explained.

My wife also gave me a hands-on test of this microscope, and she put the microscope I had left in my pocket in the washing machine with my clothes.

(Laughter) So I'm going to put it in fluorescent water, and I don't know if you can see it.

Understand how a projection microscope works

A ray of light is projected and refracted.

please turn the lights back on

We're running out of time, so I'm going to give you a quick rundown. The biggest thing in terms of production cost was that it was made in a roll-to-roll process, and as a result, I was able to make this microscope for 50 cents.

(Applause) This can bring a new paradigm to microscopy: single-use microscopy.

Let me briefly introduce the structure of this microscope.

First is a piece of paper

we were thinking like this

on A4 size paper

there are three parts

And then the optic, the top right inset, we had to figure out how to embed this lens in paper in a very productive way, so we decided to embed an achromatic lens in paper using a self-assembly process and surface tension.

there is a lens

here is the light source

And in the end, all the parts line up perfectly according to the principle of origami, which allows us to align the optics with micron-precision.

It may look like a simple toy, but the engineering behind it is truly intricate.

And the other thing we do -- and we often do to show how sturdy this microscope is -- is drop it down from the third floor.

As you can see, it was fine.

So our next goal is to finish the field test.

I'm planning to start at the end of this summer

Mass production of microscopes in units of 1,000 units

It's the first time that we've used so many microscopes in one place and tested them in the field.

We have patients with malaria, Chagas disease, and Giardia lamblia send us their own data.

Lastly, I would like to show you this photo.

What I never would have guessed was that there is a link between hands-on science education and global health issues.

What can we leave behind for our children? Children have to fight against monster soup for tomorrow.

I want my kids to print out microscopes and put them in their pockets and carry them around.

thank you

(applause)

[Contains footage of violence, so judge for yourself whether you can watch it or not] I'm a collector

A branded trowel used in the slave trade.

Handcuffs for adult slaves, and then -- adult restraints, and child ones.

We also collect postcards using Lynch photos

Postcard of Lynch

A picture of a crowd at a lynching, also a postcard, used for correspondence.

We also collect publications that support slavery, portraying black people as criminals or soulless animals.

I brought you something today

This is the branding trowel used on the slave ships.

It was used to brand the enslaved.

I wasn't a slave at that point.

I was in Africa

However, when they were brought to America, they were branded with an "S" so that they could be identified as slaves, and they were taken to Europe.

When I was young, there was one thing that captured my imagination: the Klan robes that the KKK wore.

Growing up in South Carolina, I saw KKK rallies from time to time -- not occasionally, actually -- and I've never forgotten them.

For 25 years, I couldn't do anything about that image.

I started studying the KKK a few years ago, and I focused on the second of the three major rises in their history.

At the time, it had more than five million active members, about five percent of the total population, or about the population of New York City at the time.

Their costume factory in Buckhead, Georgia, is busy, working around the clock to keep up with orders.

It is said that there were always 20,000 items in stock.

I'm a collector and an artist, so I really wanted to add clan robes to my collection, because they tell me so many things, but I couldn't find a good one.

What if a Negro in America can't find a good Clan robe in search of it?

(Laughter) There was no other way.

I decided to make the best quality clan robes in America.

No member of the KKK has ever dressed like this at a rally.

Kente cloth, camouflage patterns, spandex and burlap, silk and satin cloth, various patterns

I also made them according to age, such as for children.

also for babies

As I made many clan robes, I realized that the KKK policy that was put into the robes and what they wished for 100 years ago is still there today.

We've had racism in our schools, in our communities, in our workplaces, but it's not the people who wear the clan robes who do it.

My job is to study the long-term effects of slavery.

It's not just about the remnants of racism across society.

It's the foundation of everything we do

We've deliberately perpetrated racism where we live, where we work, and where we go to school.

suppress the vote

Minorities are imprisoned at an unfair rate

environmental racism and police brutality

There is also such a thing

covert racism is part of why racism is so powerful

If you're discriminated against for something, you can't always prove what you were discriminated against.

Racism has the power to hide, and once you hide, you're safe because you blend in with other things.

This robe is meant to show

Slavery is the foundation of American capitalism.

Slaves were the capital of capitalism.

Nathan Bedford Forrest, the top KKK officer in 1868, was a Civil War Confederate soldier and millionaire from the slave trade.

It's amazing the amount of wealth that comes from working slaves.

In 1860 alone, cotton sales were $200 million at the time.

It's worth $5 billion today

Much of that wealth has been passed down to generations today.

oops i forgot there was more than cotton

Indigo rice and tobacco

In 2015, I made one robe a week for a year.

I had an epiphany when I made 75 robes.

There is white supremacy, but the greatest force of white supremacy is not the KKK, but the normalization of racism throughout society.

I've noticed something else

Clan Robe had no power over me.

When we collectively look at these items, the branding trowels, the shackles, the clan robes, and realize they are part of our history, we can find our way to a place where they have no power over us.

If we can look at racism across society and recognize that it's woven into the fabric of America, then maybe we can do something about intentional discrimination in our schools, communities, and workplaces.

When we can do that, only then can we really look at the relics of slavery and tear down these ugly relics.

Thank you for listening

(applause)

vending machine in LA

The mall sells fish eggs

It's a caviar vending machine

This is "Art O Mat" -- they sell small pieces by various artists, painted on small pieces of wood or on matchboxes -- limited editions.

He's not a vending machine, he's Oliver Medvedik.

A biolab in Brooklyn, NY — I'm one of the founders of Genspace, where anyone can take classes and learn how to grow glowing E. coli, how to extract DNA from strawberries, and so on.

I, too, started down this strange path about a year ago when I saw Oliver extracting strawberry DNA, and I'm going to talk about it, because strawberry DNA is so beautiful and fascinating.

I never thought DNA was beautiful until I saw it in this way, and for people in general, especially artists.

There's no way to touch science in this way, so I joined Genspace right away and asked Oliver.

"If it can be done with strawberries, can it be done with humans?"

I made a procedure for extracting human DNA, and I started it myself.

this is my DNA

No one believed that when I told my artist friends about this project at a party, they could see the DNA.

I immediately took out the equipment and showed it

And so we started having this weird party every Friday night, and people would come to my house, I'd extract the DNA, and I would videotape them, because it was funny.

(Laughter) They're not the type of people who care about science.

You can tell by the reactions, but people are starting to get interested --

I was thrilled to see him gradually fall in love with science.

So we started getting together on a regular basis.

It's kind of weird to do on a Friday night, but just get started and get your friend's DNA.

I started collecting them in tubes and sorting them out, and it looks like this.

This made me start thinking

First, it's similar to Facebook's wall.

I'm building a network of genetic information

I might say

The next thing that got me thinking was when a friend looked at the vial and said, "Why are there numbers?

i didn't even think about it

The numbers were in the order they were collected, and I thought it was like collecting toys.

It's still common today -- it's like a toy in a small box with a rare item, but when you buy it, you don't know what's inside.

When opened, various kinds of

I got a toy I thought it was interesting

Remembering this and the caviar vending and the art vending, I drew a sketch of a vending machine one night.

It was meant to be a painting, with a row of little tubes of DNA.

I thought it was beautiful that the DNA sequence and the coil of the vending machine resonated.

I decided to create

here (music)

["DNA Vending Machine" is a biotechnology-themed installation] [Purchasing human DNA specimens at an affordable price from a run-of-the-mill vending machine] [Specimen comes with a limited-edition portrait of the donor] ["DNA Vending Machine" exposes the legal issues surrounding DNA's ownership by making it a collection] "DNA Vending Machine" is now — it's in a New York gallery. pcs on sale

I'm thinking about the next one, like Grand Central Station or Pennsylvania Station --

I'd like to set it up next to a regular vending machine in a subway hub, through all these different art projects.

I have a question for you all: when biotechnology and DNA analysis technologies become as cheap as laser processing, 3D printing, and vending machine caviar -- would you give your DNA to this vending machine?

How much will the specimen be worth?

Would you buy someone else's specimen?

What do you do with the specimens you bought?

thank you

(applause)

My moment of truth didn't come all at once

In 2010, the turning point came when I got the opportunity to be promoted from Director of Policy Planning at the U.S. State Department.

In that moment of "lean-in," [women stepping forward in the workplace], I was really on the verge of a handful of positions at the highest level of foreign policy jobs.

Until then, I would have answered "yes"

But for two years, life between Washington and Princeton, New Jersey, where she lives with her husband and two teenage sons, wasn't going well.

I had the idea of ​​trying to stay in Washington for another two years, and the idea of ​​having my sons and my husband change schools and jobs and move in with us.

Deep down, I knew that the right decision was to go home, even though I don't approve of many women like that myself.

Love and responsibility led me to that decision.

I couldn't bear to see him go down a bad path when I couldn't be with my eldest son when he needed me.

But real change came slowly

The next year, when things started to go well for our family, I didn't want to go back to government work, even if I could.

I didn't want to miss the last five years with my boys at home.

In the end, I decided to embrace what was most important to me, not what I wanted or would want, and this decision forced me to re-evaluate the feminist ideas I had grown accustomed to and championed.

I'm still deeply committed to the idea of ​​gender equality, but let's think about what equality really means, and what the best way to achieve equality is.

I've always embraced the notion that the most respected and powerful people in society are the men at the top of their careers, so the measure of gender equality was how many women could hold those positions: prime ministers, presidents, chief executives, directors, directors, Nobel laureates -- leaders.

I still believe that we should do whatever we can to achieve this goal.

But that's only one half of true equality, and I now realize that we can't achieve equality unless we're aware of the other half.

I believe that true equality -- perfect equality -- isn't about measuring women by men's standards.

Equality means creating a wider range of choices that are equally respected for women and men.

To do that, we have to change workplaces, policies, and culture.

True equality in the workplace means valuing family as much as work, and understanding that the two are mutually reinforcing.

As a leader and manager, I have always acted on that mantra. Family is not first, work is not second. Life is both.

If my subordinates have family problems, I want them to be dealt with properly. I can confidently say that the work is always completed properly, and the quality of the work is actually improved.

Staff who need to go home to care for children and families are more focused, efficient and results-oriented.

People who not only make money but also take care of their homes have a wider range of experience and connections.

Think of a lawyer who attends school events for his children and talks to other parents.

You're more likely to get new clients for your firm than a lawyer who never leaves the office.

Also, taking care of your home builds patience, and it really makes you more patient. It increases your empathy, your creativity, your resilience, your adaptability.

In a fast-moving, horizontally networked, global economy, these are more important than ever.

Really great companies understand this

The 2008 National Study on Workplace Transformation The National Study on Workplace Transformation found that people are more committed to their work in flexible and efficient workplaces. Not only are they more satisfied, they are more loyal.

A 2012 survey of business owners found that secure and flexible workplaces actually reduce operating costs and improve adaptability in the global service economy.

Now, you might think that putting work before family is a problem only Americans have.

Unfortunately, being absorbed in work is no longer a uniquely American disease.

Twenty years ago, when my family first went to Italy, we enjoyed the culture of the siesta.

Its purpose is not just to beat the heat of the day.

Eating together as a family, partly to appreciate the value of lunch.

Every time I go to Italy these days, fewer and fewer companies are taking time off for a siesta, probably as a result of global corporate development and 24/7 non-stop competition.

So it's a global imperative to create a place for the people we love.

Institutionally, true equality means that women recognize that the work traditionally done by women is just as important as the work traditionally done by men, regardless of who does it.

Think about it, making money and taking care of your home are both equally important in your life.

At least, unless you're in a bartering society, someone has to make money and someone else has to use that money to take care of and feed their loved ones.

When many of you said that I wanted to make money and take care of my family, I think many of you subconsciously substituted "men's work" and "women's work."

I'm not trying to tackle the classic question of why men have better jobs.

Think about same-sex couples, my friends Sarah and Emily.

both are psychiatrists

I got married five years ago and now have twins who are two years old.

They love being mothers, they love their jobs, and they're doing very well.

How in the world do you divide the responsibilities of making money and taking care of your family?

Should one of us stop working or work less hours to stay home?

Or should we both change jobs so we can have flexible schedules?

What criteria should we use to make that decision?

Should we judge people by the people who make a lot of money, or by the people who have careers?

Or do you have the most flexible boss?

From the perspective of same-sex couples, we can see that juggling work and family is not a woman's problem, but a family problem.

Sarah and Emily are a lucky example, because they can choose how much they want to work.

Millions of men and women must juggle work and family to get the money they need, and many workers are desperate.

They manage household chores, but they are inadequate and often unsafe.

If making money and taking care of a family are truly equivalent, why don't governments invest in the welfare infrastructure that underpins a healthy society as much as they invest in the physical infrastructure that underpins economic development?

Governments that understand that -- there are no surprises -- governments that understand that Norway, Sweden, Denmark, and the Netherlands offer universal parenting services, support for home caregivers, improved schools and early childhood education, protection of pregnant women, care services for the elderly and people with disabilities.

These countries invest in these infrastructures the same way they invest in roads and bridges and tunnels and trains.

In such a society, we see a mutually reinforcing relationship between making money and keeping a home.

These countries are consistently in the top 15 of the world's most competitive economies, and they also rank very highly on the OECD's Better Life Index.

In fact, even in countries like here in the United States and Switzerland, where the median income is high, they rank higher because of their low ratings for work-life balance.

So changing the working environment and improving the welfare infrastructure can make all the difference. But unless we change our culture, we're not going to have a fair and equitable choice. The cultural change we need is the resocialization of men.

(Applause) What's happening in the developed world is that more and more women are adapting to society that the home is no longer the only place for women, but men are still in the same place they used to be.

Men are still led to believe that they have to make money, that pushing other people down the career ladder is what makes them worthwhile.

Reform towards gender equality is a long road

This fight is definitely not over

But 60 years after The Myth of Femininity came out, many women have more options than men.

You can make money, you can take care of your family, and you can do both at the same time.

On the other hand, for men to choose to stay at home, they have to sacrifice their masculinity.

My friends will applaud the decision, but deep down I'm confused.

Isn't it what a man should be to compete with others for power and fame?

As many women as men think this way.

We all know that many women consider professional success to be a big factor in determining their attractiveness in men.

Women can give up their jobs and still be attractive partners.

It's a dangerous choice for men.

As parents, as partners in life, we should teach our sons and husbands to do what they want to do, whether it's to make money or take care of the family.

We need to make changes to make people think that keeping a home is cool.

(Applause) I think I can hear you saying, "This is impossible."

But in fact, change is already happening.

At least in America, a lot of men are honing their cooking skills, right in front of the stove and addicted to cooking.

Some men enter the delivery room.

Some men take parental leave if possible

More and more men are walking their children like their wives do, cradling their toddlers, doing more household chores.

In fact, some college boys even start saying things like, "I want to be a stay-at-home dad."

50 years ago, even 30 years ago, this was completely unthinkable.

In Norway, men automatically get three months of paternity leave, which they lose if they don't take it, but a senior government official told me that companies are starting to frown on promising male employees who don't take paternity leave when they have children.

In other words, it came to be seen as a character flaw in not wanting to fully fulfill the role of a father.

I've been promoted on the belief that defending women's rights means doing everything possible to help women rise to the top.

I still want to live long enough to see men and women equally in all positions.

But I've come to believe that everything should be as important to home as it is to work.

Thirty years ago, the brilliant psychologist Carol Gilligan, studying adolescent girls, argued that in every way human nature is as important as an ethic of justice is an ethic of care.

In other words, indifference is as much about what we do as it is about injustice.

Bill Gates agrees

He argues that the two great powers of human nature are self-interest and concern for others.

Why not combine the two

Let's make gender equality reform a humanitarian reform.

Humanity as a whole will become better at keeping homes and making money.

Do you think that's possible? But when I was a kid, it was customary to have cigarettes for dinner guests. Blacks and whites had separate restrooms, and everyone said they were heterosexual.

it's changed now

Human equality reform is possible

it's already happening

We will continue

It's up to us to decide how fast and how far we can go.

thank you

(applause)

Let's start with a question. Raise your hand. Anyone with an iPhone?

Have an android?

Anyone with a BlackBerry?

You're very open about being a BlackBerry user, aren't you?

(Laughter) So how many of you, like me, got here and bought a prepaid SIM card? you are there

You didn't know we were using technology that originated in Africa.

Prepaid cards are a technological idea invented by an African company, Vodacom, 15 years ago, and now, along with franchising, they are one of the world's most important economic activities.

So let's talk about African innovation, invention, which is true invention out of necessity.

let me ask you some questions first

You don't have to raise your hand this time

because it's a question

Why did Nikola Tesla have to invent alternating current electricity to light the buildings and cities we live in?

Why did Henry Ford have to invent a black-only production line for Ford cars?

Why did Eric Merrifield need to invent Dross?

It looks like this. Robben Island is visible in the background.

This is a little dross, and if you don't know it, Eric Merrifield is a very famous inventor.

In 1963, a storm ravaged the harbor of East London, a small South African town, and he came up with the idea after seeing children playing with dross, a toy made of cow bone.

It looks like the handle of a giant puppet, which is now used as a breakwater in ports around the world.

The world's shipping economy wouldn't be possible without inventions like this from Africa.

To talk about Africa, you have to have this map from space, and you're probably thinking, "Look at that dark continent."

actually a big mistake

This is the map of invention

It's easy to see where the invention was born.

It's not a place full of electricity

(Laughter) (Applause) And the reason it's not a place of invention is because people spend a lot of time watching TV and playing Angry Birds.

(Laughter) (Applause) Invention is born in Africa.

It's true innovation, invention, and it's nothing like abuse of the word "invention" to market a new product.

I believe that true invention is all about problem solving.

Africans are solving serious problems

Why? because there is no choice but to solve

because I have a problem

And solving Africa's problems also means solving the world's problems.

By the way, in California, we're talking about plastic squares that you can attach to your cell phone and accept credit card payments.

That's great, but do you really need a credit card?

In Africa, we've been doing this for years, with phones like this.

This is a picture I took in a place called Kitengela, about an hour from Nairobi.

It can be used. It uses SNS, so it can be used on any device.

You can pay bills, you can buy groceries, you can pay your children's school fees, they say you can bribe customs officials.

(Laughter) About $25 million a day is transacted on M-Pesa.

40% of Kenya's GDP comes through M-Pesa with phones like this.

You think it's just a phone

African smartphone

It can also be used as a radio or a light, and best of all, the battery life is amazing.

Why? because it is essential

Africa's energy problem is serious

By the way, you can also update Facebook or send Gmail from a phone like this.

So we've found a way to send and receive money, M-Pesa, using technology that already exists.

I'm from the mining town of Johannesburg.

It's a city that grew out of a gold mine.

This is a photo I posted on Instagram earlier

mobile is now gold

Think about how the railroad system in North America started, the infrastructure was built first, the industry grew around it, the brothels were built, it's a bit like the Internet today, isn't it?

Mobile is really gold today, because it makes all this development possible.

So what else can we do?

This was invented by Bright Simons of Ghana, and it helps you take your medicine. Some of you might spend your entire monthly salary on medicine.

It's a very simple, effective, life-saving invention.

In Kenya, there's a service called iCow, which brings you important information about caring for dairy cows.

Kenya's dairy industry is a $463 million business, but only a few liters a day separate a subsistence farmer from a commercial farmer.

If we can close that gap, we can lift ourselves out of poverty.

Just use a simple, basic phone

No electricity!

Because, like this William Kamkwamba, we can use windmills made from bicycle parts to generate electricity.

He is also one of the great men from Africa. He continues to revolutionize the world's automobile industry.

I'm trying to figure out how to rebuild the solar and electrical industries in North America, and if he's a lucky guy, he'll take us to Mars, hopefully in my lifetime.

He's from Pretoria, the capital of South Africa, about 50 kilometers from my city.

So let's go back to Egoli Johannesburg, which means "City of Gold."

Today's gold, real wealth, isn't mobile, it's not underground.

I think we are property

Economists say that Africa is now at the stage where China started to grow, and is about to follow in its footsteps.

In developed countries, the topic is about the inventions of marginal countries.

It's no surprise that inventions are born in developing countries, because everyone in central countries is busy updating Facebook, or worse, they may be having trouble with Facebook's privacy settings.

(Laughter) There are no catchy phrases.

It's an invention that transcends boundaries

Africa is called the mobile-first continent, but it's actually a mobile-only continent, and when you're killing time, we're solving the world's problems.

this is the last word from me

"You're welcome." (Laughter) (Applause)

Did anyone have a naughty daydream today?

(Laughter) Everyone did, didn't they?

thank you for raising your hand

Today, I'm going to biologically examine your dirty fantasies.

I'm going to share with you some novel facts about wild sex.

First of all, when people think of sex, men and women come to mind, but for millions of years, no such classification existed.

Sex was simply the fusion of bodies, or the shedding of DNA shared by two or more people.

Structures like the penis, which donates DNA, and the vagina, which receives it, didn't appear until five million years ago.

Right now, you're probably thinking of our human genitals, which are familiar to us.

Penis is particularly versatile

this is a paper nautilus

They are similar to octopuses and squids. Males have copulatory arms.

So what is the intersecting arm?

It's a removable swimming penis

It leaves the male's body and uses pheromones -- cues -- to swim in search of a female, stick to her body, and release sperm.

For decades, biologists have thought that the genital arm is a kind of complete animal.

This tapir is a mammal that lives in South America.

The penis has the ability to grasp objects

This penis is actually pretty dexterous, almost as dexterous as our hands.

Its dexterity allows it to pass through the vagina and eject sperm directly into the female's uterus, and as you can see, it's a good size.

But it's not the tapir that has the largest penis in the animal kingdom.

In the animal kingdom, it's the tiny barnacles that have the largest penises relative to their bodies.

(Laughter) Muhuhu (Laughter) With all this diversity, you might think that all penises have to fit well into vaginas in order to reproduce successfully.

Simply put A in slot B and that'll fix it all.

But of course it's not that simple, because it's not just the form, but the function.

We have to take into account, and function in sex is related to the contribution of each of the gametes, the egg and the sperm.

and their contributions are far from equal

With the high cost of producing eggs, it makes sense for females to be careful in choosing who to share them with.

Sperm, on the other hand, is cheap and plentiful, so it makes sense for males to have lots of sex in order to leave their offspring to the next generation.

How do animals deal with this gender difference in needs?

For example, if a female doesn't choose a particular male, or has the ability to store sperm and stores it well enough, it makes more sense for her to devote her time to other biologically useful activities, such as running away from predators, raising young, gathering and digesting food.

This is, of course, bad news for a male whose sperm bank hasn't been deposited yet, because when this happens, extreme tactics can be used to achieve successful fertilization.

This is bed bug sex, cleverly termed traumatic fertilization.

The male literally sticks his hooked, barbed penis into the female, not near the vagina.

You can poke it anywhere on her body, and the sperm simply travels through her hemolymph all the way to her uterus.

If a female gets stung too many times, or if the puncture wound becomes infected, she can die.

If you're taking a nice walk by a pond and you see a few ducks mating, you'll be alarmed by what looks like gang rape.

And frankly it's gang rape

A group of males hold down the females and insert their bullet-like spiral penises into screw-shaped vaginas over and over again.

From normal to ejaculation in less than a second

But it's the female who has the last laugh, because she changes her posture to make it easier for certain suitors' sperm to reach the uterus.

I share these stories because we humans think a lot about sex.

But the evolution of orgasm didn't really happen until mammals appeared 65 million years ago.

But before that, some animals

I was taking a primitive way to please the other party

Earwig males have very large or very small penises

It's a very simple genetic trait that doesn't affect other traits.

So whoever has the longer penis isn't stronger or bigger or anything else.

So from a biological point of view, you would think that females should mate with males with shorter penises, so that they have more time to do other things: escape predators, raise offspring, gather food, digest food.

But biologists have repeatedly observed females choosing to mate with males with longer penises.

I wonder why?

Apparently, according to the biology literature, "during intercourse, certain male genitals may elicit more favorable responses from females due to stronger physical--and stimulating interactions--with female genitalia."

Mufufu

They're Mexican guppies, and you can see epidermal cilia extending from their upper jaws, and these cilia form what you might call a "fish-whiskers."

Males have been observed to stimulate the genital openings of females prior to coitus, and as I cutely dubbed the "Magnum Private Detective Hypothesis," females overwhelmingly mate with males who have this "fishwhiskers."

It's a little guppy porn

So far, we've seen a variety of tactics that males employ to acquire female partners.

First there was the coercion tactic of violently using the genitals to have sex with females.

We also saw a caressing tactic where males actually pleasing their mates because they are chosen as partners by females.

Unfortunately, coercion tactics are what we observe over and over again in the animal kingdom.

It has been observed in many lineages, from invertebrates to birds to mammals and even apes.

And interestingly, a few mammals have specially evolved their female genitals to avoid coercion.

Female elephants and female hyenas have a penile clitoris, or rather, a penile clitoris that hangs out like a penis.

So, before the male can insert his penis into the female's vagina, the female must flip the clitoris upside down and place it inside her body.

Imagine putting one penis into another.

Imagine putting one penis into another.

And what's even more interesting is that elephants and hyenas are matrilineal societies, where female-female groups dominate society: sisters, aunts and children, and young males are expelled from the herd when they reach sexual maturity.

Adult males have the lowest status in hyena society.

They benefit from the hunt after everyone else, including their children.

So when you take away the power of the penis from the male, it seems that you're also taking away the social power that he has.

And what's important in my talk today is

There's a lot more to sex than just inserting A into B and hoping that your offspring will run around thriving.

The sexual tactics and reproductive structures found in the animal kingdom govern how males and females react to each other, which in turn determines the direction of formation and evolution of groups and societies.

So it may not surprise you that animals, including us, spend a lot of time thinking about sex, but I think you'd be surprised how much of their lives and so many of our lives are affected by it.

thank you enjoy your fantasy

(applause)

What I want to talk to you about today is that we can change our brains and our society.

he is joe

32 year old murderer

I met him 13 years ago in London's Wormwood Scrubs Prison, in the high-security lifer's wing.

Imagine this place

It's called Wormwood Scrubs It's called Wormwood Scrubs It's called Wormwood Scrubs

Built by convicts in the late Victorian era, England's most dangerous convicts

Heinous crimes are in prison Heinous crimes are in prison

I was there to study their brains.

We were part of the UCL research team. We were part of the UCL research team. We had a research grant from the UK Department of Health.

My job was to study people diagnosed as psychopaths.

I mean the most ruthless and aggressive inmate in that prison, the most ruthless and aggressive.

What is the root of such behavior?

Is there a neurological cause?

If so, could we find a cure?

So I want to talk to you about emotional change.

As a child, I was always interested in how people change.

My mother is a clinical psychologist, and sometimes she sees patients at home at night, sometimes she sees patients at home at night.

At that moment, my mother closed the living room door, and I imagined that something strange was going on in the living room.

When I was five or six, I used to sneak up in my pajamas and sit with my ears pressed against the door.

So many times I slept there, and when the session was over, my mother had to push me out. After the session, my mother had to push me out.

And so, on my first day at Wormwood Scrubs, I walked into a guarded reception room.

Joe sat on the other side of the iron table and greeted me with a blank face.

The guards were similarly expressionless and said, "If something happens, press that red buzzer."

(Laughter) I sit down

A heavy metal door slammed shut behind me.

I looked up at the red buzzer and it was right behind Joe on the other side.

(Laughter) I look at Joe

Joe read my concerns, leaned over, tried his best to reassure me, and said, "Don't worry about the buzzer, it won't go off anyway."

(Laughter) Over the next few months, we tested Joe and the other prisoners, specifically for their ability to classify photographs that showed different emotions.

We looked at their physiological responses to those emotions We looked at their physiological responses to those emotions

For example, most of us, when we look at a picture of someone looking sad like this, we immediately have a small but definite physiological response, our heart rate increases and we sweat.

The psychopaths in our study were able to accurately describe the pictures, but the accompanying emotions and

I was unable to demonstrate a physiological response.

It was as if they knew the meaning of the words, but they didn't know the joy of empathy.

I wanted to find out more, so I used an MRI to take pictures of their brains.

this was not so easy

We put the psychopaths in shackles and handcuffs and moved them through rush hour through central London. Before we could put them one by one on the MRI table, we had to remove all the metal, not to mention the shackles and handcuffs, and all the piercings they had on their bodies.

After some time after testing, we came to a tentative conclusion.

Not only are they victims of a tragic childhood, they're not just victims of a tragic childhood.

there was another reason

People like Joe have a defect in a part of the brain -- the amygdala.

The amygdala is almond-shaped and lies deep in both hemispheres of the brain.

thought to be key to the empathic response

Generally, the more empathetic a person is, the bigger and more active the amygdala.

The prisoners we tested had a problem with their amygdala, which probably led to their lack of empathy, leading to outrageous behavior.

Let's take a step back

In general, learning to act morally is like learning a language, just a part of growing up.

By the age of six months, most children can tell the difference between animate and inanimate objects.

1 year old can imitate human intentional behavior imitate human intentional behavior

For example, if the mother raises her hand and stretches, the child will do the same.

It's not a perfect imitation at first

When my cousin Sasha was two years old, she was looking at a picture book, and she was licking her fingers and turning the pages with the other hand.

(Laughter) Then, little by little, the foundations of the social brain are laid, and by the age of three or four, most, if not all, children are able to understand the intentions of others, which is essential for empathy.

The fact that this developmental process is the same everywhere in the world, in the world and in all cultures, strongly suggests that the basis for moral behavior is innate.

If in doubt, as I've done it, try to break your promise to a four-year-old.

You'll find that 4-year-olds are never naive.

Like a Swiss Army knife, they have a fixed standard of judgment, honed by the process of growth, and have a keen sense of fairness.

Early childhood is for learning morality.

It's a great opportunity, it's extremely important, and after that it's going to be much harder to learn morals, like adults learning a foreign language.

although not impossible

A recent Stanford University study found that people who played superheroes in virtual reality games who helped good people were more compassionate and helpful in real life.

I'm not suggesting superpowers for criminals, but I think we need to find ways to change the brains and behaviors of Joe and people like him.

So can the brain change?

For the past century or more, neuroanatomists and neuroscientists have believed that beyond childhood development, the adult brain no longer produces new cells, and the adult brain no longer produces new cells.

It was said that the brain only changes within certain limits It was said that the brain only changes within certain limits

that was the norm

But in the 1990s, research by Elizabeth Gold at Princeton and others began to show that neurogenesis, the formation of new brain cells, in the adult mammalian brain, first in the olfactory bulb, first in the olfactory bulb, then in the hippocampus, then short-term memory, then in the hippocampus, and finally in the amygdala.

In order to understand this process, I left the study of psychopaths and went to a research institute at the University of Oxford to specialize in "learning and development."

We used mice instead of psychopaths, because we see similar brain responses across different social animals.

If you put a mouse in a normal cage or shoe box with cotton wool, and if you don't give it a lot of stimulation, not only will it not thrive, it's going to start doing a lot of weird repetitive behaviors.

Although they are social animals by nature, they lose the ability to get along with other mice and even become aggressive when placed among other mice.

But the so-called rich environment -- but the so-called rich environment -- with all the other mice -- spacious with running wheels and ladders and places to explore -- mice that grow up in that environment have new neurons, new brain cells, and they have good memories and learn well.

You can't be as moral as you are to carry the shopping bags of an old mouse across the street, but a good environment breeds healthy and social behavior. A good environment breeds healthy and social behavior.

Mice raised in ordinary cages, on the other hand, have dramatically lower rates of new neurons in their brains, if not prison-like environments.

The amygdala of mammals, including primates like ours, clearly shows neurogenesis in the amygdala of mammals, including primates like us.

In some parts of the brain, more than 20% of the cells are newly made.

It's only recently that we're beginning to understand exactly what these cells do, and it turns out that the brain can change a lot in adulthood.

Our brains are also sensitive to stress.

When glucocorticoids, stress hormones, are released by the brain, they inhibit the production of new cells.

The more stress you have, the less your brain develops, which leads to less adaptability and higher stress levels.

This is the interaction between nature and nurture that we see firsthand in real life.

So when you think about it, it's ironic that the solution is to put people with stressed amygdala in an environment that stunts their brain growth.

Of course, prison sentences are necessary in the criminal justice system, and they are necessary to protect society.

Our research doesn't suggest that criminals should submit MRI scans as evidence in court and avoid liability for defects in the amygdala.

rather the opposite

Our brains can change, so we have to take responsibility for our actions, and people with defective amygdala have to take responsibility for their rehabilitation.

One way that rehab might work is through a restorative justice program.

If the victim chooses to participate, they face the perpetrator in a safe and organized environment.The perpetrator is encouraged to take responsibility for their actions, and the victim plays an active role in the process.

In such a situation, the perpetrator, perhaps for the first time, can see the victim as a real human being with thoughts and feelings -- a real human being who responds with real emotions.

This stimulates the amygdala and may result in a more effective rehabilitation practice than just incarceration.

It's not going to work for everyone, but for many it's a form of inner breakthrough.

What can we do now?

How can this knowledge be applied?

Finally, I'll tell you three things I've learned. Finally, I'll tell you three things I've learned.

First of all, we need to change our mindset.

Since Wormwood Scrubs was built 130 years ago, society has progressed in every way, in the way schools and hospitals run, in every way, in the way schools and hospitals run.

But when it comes to prisons, it's almost like we're back in the 19th century, if not the Middle Ages.

For too long, we've been falsely persuaded that we can't change our humanity, and society as a whole pays a heavy price.

We know that the brain can change a lot, and the best way to do that, even in adults, is to change and modulate our environment.

The second thing I've learned is that we need to bring people together who believe that science is essential to making a difference in society.

It's easy for one neuroscientist to put a heavily monitored prisoner into an MRI machine.

Well, it wasn't easy, but... in the end, it's about reducing recidivism.

To answer such complex questions, we need people from different backgrounds -- experimental scientists, clinicians, social workers, politicians, philanthropists and human rights activists -- working together.

And finally, I think we need to change our own amygdala, because this question touches the core question of who we are, not just Joe.

We need to change the way we think people like Joe are utterly irredeemable, because if we see him as utterly irredeemable, how can he change himself?

In 10 years, Joe will be released from Wormwood Scrubs.

Will he be among the 70% of prisoners who will repeat offends Will he be among the 70% of prisoners who will repeat offenses and go back to prison?

Wouldn't it be better, while serving his sentence, for Joe to regenerate and train his amygdala to encourage new brain cell growth and connections so that he can face the world when he gets out?

I'm sure it will benefit all of us

(Applause) Thank you. (Applause)

The world's largest migration of people happens once a year in China.

Families reunite and celebrate -- three billion rides during the 40-day Lunar New Year travel season.

The hardest part of that journey is for the 290 million migrant workers, many of whom have only one chance a year to return to their homes and meet the parents and children left behind.

But their travel options are very limited, and airline tickets cost almost half their monthly salary.

So many of them travel by train

Average distance traveled is 700km

Average travel time will be 15 and a half hours

China's railways have to accommodate 390 million travelers each Spring Festival.

Until recently, migrant workers had to stand in long lines for hours, sometimes days, to buy tickets and were often defrauded by scalpers.

And when the day came to leave, they had to face a near-defeat situation.

But thanks to technology, the situation is improving.

Mobile e-tickets now account for 70% of sales, and queues at stations are significantly shorter.

Manual ticket gates are being replaced by digital ID scanners, speeding up the boarding process Artificial intelligence is being deployed across the network to optimize routes.

New solutions are invented

Didi Chuxing, China's largest ride-hailing company, has launched a new service called Hitch, which matches people returning home by private car with passengers looking for long-distance routes.

In just three years, Hitch has provided 30 million trips this holiday season, the longest drive being over 2,400 kilometers.

That's roughly the distance from Miami to Boston.

The enormous need of migrant workers has led to rapid improvements and innovations in transportation systems across the country.

China's Internet is developing in familiar and unfamiliar ways.

Just like in Silicon Valley, some of the dramatic changes in technology and consumer behavior are driven by advances in scientific and technological research, driven by the pursuit of desire by corporations, driven by the whims of privileged people and young people.

I am a child of the American high-tech industry, both as a consumer and as a business leader.

So I have a good understanding of this type of force.

But about a year and a half ago, I moved from New York City to Hong Kong and became CEO of the South China Morning Post.

And in this new perspective, I see things that are unfamiliar to me that are driving innovation and a lot of entrepreneurs in China.

An economy fueled by overwhelming demand is serving a large number of people in need who have been left behind by China's economic boom for 30 years.

Significant disparities exist between the rich and the poor, between the urban and the rural, between the educated and the uneducated, and these disparities provide the soil and conditions for producing amazing power.

So when capital and investment are focused on the needs of those at the bottom of the economic hierarchy, we're going to see the Internet really create jobs, spread education, and many other advances.

Of course, China is not the only place where this new power exists, nor is it the only place where such innovation is possible.

But because of the sheer size of the country and its status as an emerging superpower, the needs of its people create opportunities for compelling impact.

When explaining the rapid growth of China's high-tech industry, many observers would cite two reasons.

The first is the 1.4 billion people who call China their homeland.

The second is active government participation, which can be viewed as broad-based intervention.

Over the years, central governments have invested heavily in network infrastructure, creating an attractive investment climate.

At the same time, they enforced standards and regulations, which led to rapid agreement and rapid implementation.

We have the world's largest high-tech workforce because there's so much motivation for education.

And domestic firms in rural areas have long been protected from international competition by market controls.

Of course, if you look at the Internet in China, you can't help but notice the concerns of widespread censorship and dystopian surveillance.

China, for example, is trying to roll out a social credit rating for its entire population, rewarding and restricting its citizens based on very qualitative traits like honesty and honesty.

At the same time, China is equipping many of its 170 million surveillance cameras with facial recognition systems.

In Xinjiang Province, where Muslim minorities are under constant surveillance, artificial intelligence is being used to predict crime and terrorism.

Despite this, the Internet continues to grow and is much bigger than we think.

By the end of 2017, the number of Internet users in China reached 772 million.

That's more than the population of the United States, Russia, Germany, Britain, France and Canada combined.

98% of them are mobile phone users

92% use messaging apps

There are now 650 million online news users, 580 million video service viewers, and Taobaowan, China's largest e-commerce platform, boasts 580 million monthly active users.

That's 80 percent higher than Amazon.

China now has 10 billion on-demand motorbike and car trips a year.

That's two-thirds of the world's total

So there are good and bad

There's no question that the Internet in China is restricted and manipulated, but it's also massive and greatly improving the lives of its citizens.

So instead of dismissing China's growing Internet, albeit imperfectly, it's worth taking a serious look at it.

Let's talk about two more things today.

Lu Caoliu is a 34-year-old engineer from Jiangxi.

His hometown was the birthplace of the Red Army, so it was very important to the Communist Party.

But Jiangxi lost its importance over the decades because it was so far from China's economic and manufacturing center.

Lou, like many of his generation, left home at a young age to find work in the big cities.

We settled in Shenzhen, one of China's high-tech hubs.

As the young leave, rural communities are left mostly with the elderly, struggling to escape abject poverty.

In 2017, nine years after leaving his village, Lu decided to return to Jiangxi, believing that China's burgeoning e-commerce market could help revive his home village.

As is often the case in rural areas, Lu's family was also involved in manufacturing local specialty products, and in their case it was rotten milk.

So Lou set up a town factory and started selling local products online.

In China's big cities, consumption has been growing for many years.

Recently, thanks to technology, China's middle and upper classes are spending more and more on specialty products.

WeChat and other e-commerce platforms are enabling local producers to sell their goods far beyond their original distribution area.

Research firms track the extent of these impacts by counting what they call "Taobao villages."

A "Taobao village" is a village where at least 10 percent of households earn income by selling goods online.

This has grown tremendously over the last few years.

There were only 20 Taobao villages in 2013, 212 villages in 2014, 780 villages in 2015, 1,300 villages in 2016, and over 2,100 villages by the end of 2017.

Nearly 500,000 online stores are now live with annual sales of $19 billion and created 1.3 million new jobs.

Roo hired 15 villagers the first year he returned to the village.

About 60,000 bottles of rotten milk were sold.

We expect to hire 30 more people next year as demand soars.

Sixty million children are left behind in rural areas scattered across China.

At least one parent leaves home as a migrant worker when the child is growing up

In addition to the general difficulties of rural life, they often have to travel long and dangerous roads even to get to school.

Such children make up 30% of primary and secondary school students in China.

10-year-old Zhang Wensheng is one of them.

Every day, in this deserted landscape, he walks an hour each way through a deep canyon to school.

But when we got to a small farming village in Gansu province, there were only two other students in the whole school.

There are 1,000 schools like Zhang's in Gansu alone with fewer than five students.

With limited student interaction, unqualified teachers, and ill-equipped school buildings that aren't even insulated, students in remote areas have long been at a disadvantage and have almost no access to higher education.

But Chan's future is changing dramatically with the installation of the Sunshine Classroom. He's now in a digital classroom, where 100 students across 28 schools are live-streamed by qualified, certified teachers from hundreds of miles away.

Now, you're exposed to new subjects like music and art, you can make new friends, and you get experiences that extend beyond your hometown.

The other day, Chan was able to visit the museum at Frederiksborg Castle in Denmark, online, of course.

Online education has existed outside of China for many years.

It wasn't really transformative, probably because in other technologically advanced parts of the world, the traditional education system is much more advanced and much more stable.

But China's extreme terrain and vastness created a need for massive and immediate innovation.

A technology start-up in Shenzhen has grown to 300,000 students in just one year.

The South China Morning Post estimates that 55 million rural students across China now have access to live-streaming classes.

This market of need is larger than the total number of K-12 students in the United States.

I'm very encouraged because private investment in high-tech education in China has exceeded one billion dollars a year, with an additional $30 billion of public funding due between now and 2020.

As China's Internet continues to grow, despite its shortcomings, regulations and controls, it is irreversibly improving the lives of people who were once forgotten.

Because the focus is on meeting people's needs, not their wants, it's sparking a lot of curiosity and creativity that's driving the developments you're seeing.

And there is still room for growth

In the United States, the Internet population, or penetration rate, is currently at 88 percent.

In China, Internet population is still only 56%.

So there are over 600 million people who are not yet connected to the internet.

That's about twice the population of the United States

There are huge opportunities here

Wherever there is an alternative fuel for this economy, whether it's in China, Africa, Southeast Asia, the middle part of the United States, or anywhere else, we should be pushing it with capital and effort, and it will have economic and social implications around the world.

Just imagine what more would be possible if the global needs of the underprivileged became the overriding subject of invention? What more is possible when it becomes the overriding subject of invention?

thank you

(applause)

I want all of you to think about the third word when you talk about yourself -- or, if you're pregnant, when you talk about the person you're pregnant with.

just move your mouth

You can say it aloud. The first two words are "The child's gender is..."

Now, the problem that I'm also struggling with is that I'm not sure if it's a "girl" or a "boy," so a vague answer would be appropriate.

Now, of course, the answer is not at birth, but at ultrasound, unless future parents choose to be surprised in the way we are today.

But what I want you to think about is what determines this third word, because that third word is your gender.

That means it's based on your genitals.

As a pediatric endocrinologist, I've been, and still am, deeply involved in cases where there's a mismatch on the outside, or between the inside and the outside, and we literally have to find out what the person's gender is.

But there is nothing solid that can define a person at birth.

By the way, when I say definition, I'm referring to a person's sexual orientation.

we're gay boys

I don't say "lesbian girl"

You can't really define them in their first 20 years of life.

That early appearance doesn't define a person's sexual orientation or represent a person's self-concept as opposed to their anatomical gender. Do you know if you're a man, a woman, or somewhere in between?

Even by the age of 10, they'll occasionally show up, but it's hard for parents to understand because transgender play and behavior is so common in children, and in fact, studies show that 80 percent of those who do, don't stick with their gender identity by the time puberty hits.

But by the time puberty hits, at the age of 10 to 12 for girls and 12 to 14 for boys, when your breasts start to swell, or if you're genetically male, your gonads are two or three times more developed, the child who says, "I have a completely wrong body," is almost certain that he or she is transgender, and no amount of restorative treatments or anything else that's tried is very hard to change that feeling.

Now, this is a relatively rare occurrence, so I've had rather little experience with it.

Because of my inexperience, my experience was a cookie-cutter one. I met a 24-year-old man.

This person is genetically female and went to Harvard University with three male roommates who knew everything. The registrar always put his name on the course registration list as male.

In fact, I was born without gonads.

I've seen a lot of people, and it's not that hard.

But I promised him that if I could learn from you, I'd see him.

he did

And what an important lesson I learned from taking on all of his support members.

On the other hand, I had a real headache, because I thought it would be relatively easy at this age to give someone the hormones they were sure of.

But eventually the patient got married. As a man, he married a former man's woman, had two children, and then transitioned to being a woman.

And this illustrious woman became intimate with my male patient, and in fact, was legally married, because they are one man and one woman.

What the hell is that? (Laughter) Confused, I thought, is this what makes a person gay?

Is it something to straighten? and

I was confusing sexual orientation with gender identity.

And my patient said, "OK

If you think about it this way, you'll get it right: sexual orientation is who you're sleeping with.

Gender identity is who you go to bed as."

And from the many adults that followed -- I examined about 200 of them -- I learned from them that if I had just glanced at a patient's partner in the waiting room and didn't really look at them, I would never have been able to figure out whether they were gay, straight, bisexual, or genderless based on their perceived gender.

In other words, one gender is the partner's gender

It has absolutely nothing to do with it. My experience shows that. Now, I've seen 200 adults.

I know it's incredibly painful

These people - many of them had to give up a good deal in life.

Sometimes parents reject them, their siblings, their own children, and divorced spouses forbid them from seeing their children.

It's a big deal, but why would you go to therapy when you're 40 or 50?

Because they feel the need to affirm themselves before committing suicide.

And in fact, untreated transgender suicide rates are among the highest in the world.

So what should we do?

I attended a conference in Holland and was intrigued, and I saw the most amazing thing in the crowd of experts in this field.

They gave young adolescents very thorough psychological tests about their sex, and then they gave them treatments to prevent the unwanted onset of puberty.

Because kids basically identify with both genders until puberty, when they feel like they belong to the wrong gender, it's like Pinocchio turning into a donkey.

The illusion that your body changes into what you want it to look like at puberty is undone by the actual arrival of puberty.

and they will be crushed

This is why you should stop puberty

Why do you stop eating? Young people can't be given hormones of the opposite sex so easily.

It's stunted, and do you think you can have a meaningful conversation with a 10-year-old girl or a 12-year-old boy about the effects of that treatment on fertility?

So in the course of treatment, we buy them four or five years of time so they can deal with what's going on.

Get more tests so they don't feel like their bodies are separate from themselves.

And then there's a program called 12-16-18, where at about age 12, you're given blocking hormones, and at 16, you're retested to see if you need treatment again. Now, remember, if you stop blocking hormones, you can get your body back on track, but if you get hormones of the opposite sex, your breasts and beard will start to grow and your voice will change. no

For a 15- or 16-year-old, this is a big deal.

And at the age of 18, he is deemed fit for surgery.

Female-to-male sex reassignment surgery is difficult, but male-to-female surgery is as good as beating a gynecologist.

That's how good it is

So I was shown these patients, who were no different than normal people except for delayed puberty.

But once you give them hormones that match their gender identity, they become beautiful.

I can see without any problems. I'm normal height.

You wouldn't be able to tell them apart in the crowd

At this point I decided to do this

This is exactly where the endocrinology department of pediatrics comes into play, because it's actually pediatric endocrinology that deals with children aged 10 to 14.

I started treating some children, which is now the standard of care, and our children's hospital also helped.

I showed them the children before and after treatment, the ones who hadn't been treated, the ones who wanted treatment, and I showed them pictures of what it was like in Holland.

Now where were these children once?

In pain that's where they used to be

So we started a program in 2007.

It was the first Dutch version of it in North America, the first in North America.

Since then, we've seen 160 patients.

Are they from Afghanistan? no

75% come from within 250 kilometers of Boston

Some were from England

Jackie, who lives in the Middle East of England, was abused.

Here's a picture of her when she was 12 years old, living as a little girl and being subjected to horrific violence.

I was subjected to horrific violence and was forced to homeschool.

The reason they came is because in England children under the age of 16 are not treated at all, which means that no matter what is going on, only adult bodies are being treated, even if they do a lot of testing.

Jackie was also predicted to be about 200 cm tall due to her skeletal features.

And she had just hit puberty as a man.

I did something groundbreaking here because I know hormones and I knew that estrogen could be more potent than testosterone in closing epiphyseal growth plates and stopping growth.

So we blocked testosterone with blocking hormones and put estrogen at age 13, not until age 16.

And on the left is 16 year old Jackie.

On her 16th birthday, she went to Thailand, where she underwent sex reassignment surgery.

Currently available from the age of 18

She ended up being 155cm

What's even more remarkable is that she has normal-sized breasts, and by blocking the effects of testosterone, any of our patients can achieve normal-sized breasts if treated at the right age when it's not too late.

and she's the one on the far right

She went public and made it to the semi-finals of the Miss England pageant.

The jury debated: Should we accept this?

I heard someone quip, "But she's more natural than half of her competitors."

(Laughter) Some of the candidates were a little tweaked, but she's all in the blueprint of her DNA.

and she became a great spokeswoman

When I was approached about a contract as a model, she teased me by saying, "If you had made me 185cm, maybe I would have had more chances as a model."

What do you mean? (smile)

Well this photo says it all

I think you really said it all

Nicole and her brother Jonas are identical twin boys, even though they're supposed to be identical.

Nicole, as early as three years old, claimed to be a girl.

I changed my name at seven

He came to me. Now, when you look at 14-year-old Jonas, you can imagine the precociousness of this family, because he looks like he's about 16.

It justifies the claim that we must be conscious of the patient's reality.

Nicole here is in a state where puberty is blocked, while Jonas is under normal biological development.

This is what nicole would look like if we didn't treat her.

protruding larynx,

He's got a square face, he's got a mustache, and you can see the height difference, because he's undergoing rapid growth that she couldn't have.

Nicole is affected by estrogen.

I have a feminine body

This family visited the White House last spring for the anti-discrimination movement, for the anti-discrimination movement, and there was a bill in Maine that would strip transgender people from using public restrooms.

You can tell I'm not dangerous when you look at me, but if you use the men's restroom you'll be in danger."

And finally lawmakers seem to understand

So what do we do from here?

In terms of anti-discrimination, we still have work to do.

There are only 17 states with antidiscrimination laws in housing, employment and public facilities, five of which are in New England.

I need a less expensive drug

medicine costs a lot

And transgender should be excluded from DSM

The idea that being gay or lesbian equated to mental illness disappeared in 1973, and the whole world changed.

Transgender isn't a drag on anyone's budget

not so common

The risk of doing nothing for them not only exposes them to suicide attempts and loss of life, but it also speaks to whether we are a truly inclusive community.

thank you

(applause)

[Rebecca Neuberger Goldstein] [Steven Pinker] Far-reaching Reason (Driver) $22 (Pinker) Yes

Goldstein: Reason is in troubled times, popular culture is getting crappy, and the quality of political discourse is rapidly declining.

We're living in a time of scientific creationism, 9/11 conspiracy theories, psychic telephony, and religious fundamentalism returning.

Overthinking is denounced as elitist, even higher education institutions are attacked for logocentrism, and it is a sin to allow logic to dominate thought.

(Pinker) But is that really a bad thing?

Maybe reason is overrated

Many experts argue that good intentions and a clear and unwavering morality trump the elaborate schemes of big-headed bureaucrats, because the "supreme intelligence" pulled us into the quagmire of the Vietnam War.

And isn't reason the source of devastation on Earth and threatening humanity with weapons of mass destruction?

That being said, virtue and conscience will save us, not cold calculation.

And humans aren't sticks with brains on them.

Fellow psychologists have proven that humans are guided by their bodies and emotions, and only use a little reason to justify their intuition.

(Goldstein) But how can a rational argument say logically, "The rational argument is invalid"?

Though you try to convince me that reason is powerless

I'm not intimidating or bribing you, so you could say I'm solving this problem with a majority vote or a beauty pageant.

And your attempts at persuasion itself should be evidence of the power of reason.

Reason shouldn't be easy to use here

You make reason an issue, but you lose the argument from the start.

(Pinker) But can reason make us good and polite and moral?

You point out that reason is just a means to achieve a goal, but the goal changes depending on the sensibility of the owner of reason.

If people want peace and harmony, reason will go for peace and harmony, but if they like conflict and controversy, they will go there.

Will reason alone avoid cruelty and devastation?

(Goldstein) If it's just reason, the answer is no, but you can easily turn it into a yes

All you have to do is meet two conditions: one is that the person with reason takes care of his or her well-being.

This is an essential element for reason to work, and it's a sensibility that everyone has.

We are all passionately concerned about our own well-being

The second condition is that people of reason must be able to form a community to exchange messages and understand each other's point of view while influencing each other's well-being.

It's a good fit for a species with a sociable, chatty language instinct like us humans.

(Pinker) It makes sense in theory, but is it true?

In particular, I spoke at TED five years ago — could that explain the important historical progress?

That is, humanity is becoming more and more humane.

Centuries ago, our ancestors burned cats to death as a pastime.

The knights were always at war, trying to kill as many of their peasants as possible.

The government executed people for trivial reasons, like stealing cabbages or disrespecting the royal gardens.

Executions are designed to be as long and painful as possible.

Even a respectable person had slaves

Modern people have their flaws, but they've abandoned barbaric customs

(Goldstein) Humans have essentially changed?

(Pinker) No, we still have instincts that lead to violence: greed, tribalism, revenge, dominance, sadism.

But at the same time, we also have an instinct to avoid them, like self-control, empathy, fairness, which Lincoln called "the good angel who lives in our nature."

(Goldstein) If humanity doesn't change, what drives the "good angel"?

(Pinker) There are many things, but I think the target of empathy has expanded.

Our ancestors once felt only the pain of their own family and neighbors.

But as literacy and travel expanded, people became more sympathetic to a broader range of people, from kin to tribes to nations to races and perhaps eventually to all of humanity.

(Goldstein) But do you really believe a hard-headed scientist's lukewarm empathy?

(Pinker) I actually trust you.

Neurophysiologists have discovered that certain neurons respond to the actions of others in the same way they respond to their own actions.

Empathy comes early — maybe even before the age of one

There are also best-selling books on empathy, like "Empathic Civilization" and "Towards an Era of Empathy."

(Goldstein) I agree with empathy, but so does everyone else.

But when it comes to developing morality, empathy is not enough.

In the first place, empathy is biased, and it tends to be toward blood relatives, babies, and fluffy animals.

So with only sympathy, ugly strangers don't care

No matter how hard you try to empathize with people you don't connect with, it's just not enough. Adam Smith points out the sad truth about human nature.

(Adam Smith) Let's assume that China is suddenly hit by a devastating earthquake, and how will European philanthropists react to news of this terrible disaster?

probably hit the poor people first — condolences to the unfortunate

Then you will sink into melancholic thoughts about the frailty of life, but once you have expressed these humane feelings, you will easily return to your work and your pursuits of entertainment, as if the disaster never happened.

If I lose my little finger tomorrow, I won't be able to sleep at all that night, but if I don't see it with my own eyes, even if a hundred million of my fellow countrymen are ruined, I'll go to sleep in peace.

(Pinker) But if empathy alone doesn't make you humane, what else?

(Goldstein) You've forgotten what could be our best — "good angel," which is reason.

reason has power

Reason expands the circle of empathy - it has power

All the humanitarian developments you mention have their roots in thinkers.

What they showed was that the way people treat certain groups and the treatment they want to be treated are logically inconsistent.

(Pinker) Does reason actually change the human mind?

Do humans cling to beliefs that are convenient for them or follow the culture in which they were born and raised?

Goldstein: There's an interesting fact about humans. When we're confronted with contradictions, we get distracted by them.

By following the evolution of morality, we can trace the path from arguments based on reason to actual changes in perception.

The argument that thinkers have often put forward is that certain customs are untenable, irrational, and inconsistent with pre-existing values.

Their critiques were contagious, translated into many languages, sparking debates in pubs, coffee houses, salons and dinner parties, influencing leaders, politicians and public opinion.

As a result, the conclusions reached by the thinkers were taken in by common sense, and the traces of the discussions leading up to them disappeared.

That's why most of us today don't have to rigorously and philosophically discuss why slavery, public hangings, and the corporal punishment of children are evil.

These things just feel bad now

But there was a time when it needed to be discussed, and in fact it has been discussed for centuries.

(Pinker) So you're saying it took a lot of step-by-step discussion to convince you that burning a heretic at the stake was a bit problematic?

(Goldstein) Yes, the French theologian, Sebastian Castello, argues that

(Sebastian Castello) Calvin says he's right, other sects say they're right

Who will decide?

Who is it right for? For Calvin?

So why does he write so many books to prove the truth?

Given this ambiguity, heretics can only be defined as "those who think differently."

So if you kill heretics, the logical consequence is to annihilate each other, because each believes they are right.

(Pinker) Do you think bone-crushing cruel punishment is evil?

(Goldstein) The U.S. Constitution's prohibition against cruel and unusual punishment was influenced by a pamphlet distributed by Italian jurist Cesare Beccaria in 1764.

(Cesare Beccaria) As punishment becomes crueler, the human mind becomes numb, for the mind, like a liquid, conforms to its surroundings.A hundred years of cruelty, and breaking bones on wheels, gives no greater terror than imprisonment.

The only thing necessary to achieve the purpose of punishment is that the pain of punishment be greater than the gain of crime, and that estimate must take into account the necessity of punishment and the value lost by crime.

Punishment beyond that is excessive and inhumane.

Pinker: But the anti-war movement relies on mass demonstrations, haunting songs by folk singers, and poignant photographs of war victims.

Goldstein: Yes, but the modern anti-war movement can be traced back to a long history of thinkers who have argued why anti-war sentiment should be used. Erasmus, the father of modern thought, is a good example.

(Erasmus) The benefits of peace are spread far and wide and reach many people, while in war, even if they are successful, the benefits reach only a few people, who are not entitled to them.

One is safe because the other is ruined

One got the results because he plundered the other.

A source of joy for one becomes a source of grief for the other

In war all misfortune strikes mercilessly, but on the contrary, all good fortune is born from the grief of the other - savage and cruel fortune, despicable fortune.

(Pinker) But we all know that the abolitionist movement was founded on faith and emotion.

The movement was led by the Quakers, and it only spread after Harriet Beecher Stowe's "Uncle Tom's Cabin" became a bestseller.

(Goldstein) But it started 100 years ago.

John Locke defied conventions that had been considered natural for thousands of years.

Locke argued that slavery contradicted the principles of rational government.

(John Locke) Human liberty under government is to have established norms. Norms are common to all who live in a society, created by the legislative powers chosen by that society, and to have the freedom to follow one's own will at all times unless norms prohibit it -- the freedom not to be subject to the will of others, contradictory, uncertain, unknown, arbitrary, because freedom in the state of nature is not subject to any restrictions other than natural law.

(Pinker) Sounds familiar.

where did you read that? oh yes

(Mary Astell) If the state doesn't need absolute sovereignty, why does the family need it?

On the contrary, if the family needs it, why doesn't the state need it?

Why one is not true cannot be argued for the other If men are born free, why are women born slaves? For if obedience to the contradictory, uncertain, unknown and arbitrary human will is the condition of slavery, women are slaves themselves.

(Goldstein) It's just a function of reason to take in logic.

One empowerment movement gives rise to another movement because the logic is the same, and once that logic takes hold, it becomes harder to ignore the contradictions.

In the 1960s, the civil rights movement expanded into women's rights, children's rights, gay rights, and animal rights movements.

But two centuries earlier, Enlightenment thinker Jeremy Bentham had argued that practices like cruelty to animals were indefensible.

(Jeremy Bentham) The question isn't whether animals are rational or can talk, it's whether they can feel pain.

(Goldstein) As for persecuting homosexuality...

(Bentham) In terms of temporary harm, homosexuality obviously hurts no one.

Rather, homosexuality produces pleasure

because they both want

If one side doesn't want it, the act is a sin and the essential consequences are completely different.

It's a personal injury and a form of rape.

In terms of dangers other than pain, if there are any at all, it is mostly homosexual tendencies themselves.

What are homosexual tendencies?

It is the point that encourages others to behave in the same way.

Yet this behavior does not cause any pain to anyone.

(Pinker) But in every case, it takes a century for the claims of a great thinker to be transmitted little by little and permeate society as a whole.

What about the modern world we live in?

Are there any customs that continue despite the open dissent in our customs?

(Goldstein) Will our descendants look back and be appalled at what we're doing now? As we are appalled that our ancestors owned slaves, burned heretics, beaten wives - denounced homosexuality.

(Pinker) Anyone can give an example.

(Goldstein) I'd say that animals are being abused on factory farms.

(Pinker) So is the incarceration of non-violent drug offenders and the acceptance of rape in prisons across the country.

(Goldstein) Same goes for cutting aid to developing countries that save lives.

(Pinker) Possessing nuclear weapons

(Goldstein) So is the use of religion to justify things that are normally unacceptable, such as banning contraception.

(Pinker) So what about faith in general?

(Goldstein) I don't expect much.

(Pinker) But I'm convinced that reason is the good angel who has contributed most to the moral progress that mankind has enjoyed, and that progress will continue in the future -- it gives me hope.

(Goldstein) And if you find fault with this argument, remember that you are relying on reason when you point it out.

thank you (pinker) thank you

(applause)

I want to talk to you today about a problem

It's a very simple, yet devastating problem that's spreading all over the world.

The problem is the "dummy company".

Sounds somewhat impersonal and technical, doesn't it?

But shell companies make it difficult, or even impossible, to figure out who the real masterminds behind these heinous crimes are.

Why am I telling you this story?

I'm a trouble maker at heart. My twin brother and I were taught by our parents to question authority.

(Laughter) I'm sure my parents regretted it a lot. As I entered puberty and became rebellious, I certainly became very suspicious of my parents' authority.

Many of my teachers at school weren't too impressed with my attitude either.

Ever since I was five years old, I've been asking one question over and over again: "But why?"

But why does the earth revolve around the sun?

But why is your blood red?

But why do I have to go to school

But why should I respect teachers and authorities?

I never thought of it myself, but this question became the foundation of my life and led me to do many things.

And that was -- when I was in my twenties, quite some time ago, on a rainy Sunday afternoon in North London, and I was sitting side by side with Simon Taylor and Patrick Alley, busy packing shipping documents, in the offices of the activist group we were working for at the time.

We were talking, as usual, about various problems in the world.

He was particularly enthusiastic about the civil war in Cambodia.

It's been discussed many times before.

We stopped talking, looked at each other, and said, "But why aren't you going to change this?"

It's been more than 20 years since that slightly outlandish question, and we've done a lot in that time. It's also the question that helped Blood Diamond bring the world's attention to the issue of how civil wars are being financed. Global Witness is now a mighty 80-person team of activists, investigators, journalists, and lawyers.

There's only one belief that drives us all: change is really possible.

What exactly is Global Witness doing?

We conduct research and publicize it to uncover the "true" masterminds of all kinds of evil: those who finance conflicts, who steal millions of dollars from citizens around the world, and who, as we call it looting, cause environmental destruction.

And we're working hard to change the system itself.

We do this because of the fact that quite a few countries rich in natural resources like oil, diamonds and timber are home to some of the poorest and most exploited people on the planet.

It's the accepted business practices that make many of these frauds possible.

One of them is a "dummy company".

A lot of the research we're doing now involves shell companies. For example, in the Democratic Republic of the Congo, we uncovered how shell companies were used in secret transactions to rob citizens of one of the world's poorest countries well over a billion dollars.

For this country, that's double the annual budget for health and education.

And in Liberia, an international timber logging company, using multiple front companies, was trying to take control of a significant portion of Liberia's unique forests.

In Sarawak, Malaysia, too, political corruption has destroyed much of the forest.

Dummy companies are being used there too.

We secretly filmed the family and lawyers of the former prime minister of Sarawak, where they told undercover investigators how they used shell companies to make shady deals.

The worst thing is that this kind of thing happens a lot, everywhere, at every level.

In other words, there's an extraordinary scandal lurking in the mundane landscape.

Los Zetas, the ruthless Mexican drug cartel, also uses shell companies to launder money, and its operations are tearing communities across the Americas apart with drug-related violence.

And in some cases, they used shell companies to buy up Americans' tax debt, add up legal fees, and force homeowners to pay, saying, "Pay it back or lose your house."

Imagine being threatened with having your house taken from you for just a few hundred dollars in debt, and you have no idea who you're dealing with.

Shell companies are also ideal for sanctions evasion.

The Iranian government owned a building on Fifth Avenue in the middle of Manhattan, despite being sanctioned by the United States for intervening in a series of shell companies.

Juicy Couture, famous for its velvet tracksuits, happened to have a store in that building.

There are countless examples of this, from horsemeat contamination in Europe to the Italian mafia, which has been using shell companies for decades.

The $100 million fraudulent Medicare bills, the arming of wars around the world, and the wars in Eastern Europe in the early '90s, all involve shell companies.

The existence of shell companies was also a problem during the recent revolution in Ukraine.

But in every case that we and others have uncovered, more remains shrouded in darkness, and the current system allows us to do so.

The simple fact is that some people commit insane crimes, steal money from millions of citizens like me and you, and end up not being identified and accountable.

this is not fair

I'm sure you're wondering, what exactly is a dummy company? Can I set up and run a company without anyone knowing who I am?

the answer is yes you can

But for some people, like me, you have to see it for yourself to believe it, so let me show you.

First you have to decide where to set up

I'm sure you're thinking of a nice tropical island tax haven, but surprisingly, my hometown of London, and the United Kingdom, are also some of the best places to set up a dummy company.

What's better is America

In some states in the United States, the ID requirements for setting up a company are less stringent than when getting a loan card at the library. Delaware is the case, and it's one of the easiest places in the world to set up a dummy company.

So let's say we're setting up in the state of Delaware in the United States.

There's a company that can set this up for you, and it's all legal and normal business.

I'm giving you one here, but there are many options.

Once you have selected your provider, select the type of company you would like and fill in your contact information, name and address.

But don't worry, I don't use your real name.

It can be in the name of a lawyer or a service provider, and in any case it will not appear in public records.

And then the company owner information.

And here's the point: you don't have to do this either, because with a little imagination, there are plenty of people in this wide world, and all you have to do is find a lender.

Legally pay this lender to become the owner of your company.

You don't even have to be human if you don't want to involve other people.

It doesn't matter if it's another company

Finally, name the company, add a little information, and pay the money.

The service provider then takes care of the rest, and it's ready in a matter of hours.

You can be there and shop online for 10 minutes and you've created a shell company.

It's not just easy, it's very easy, it's cheap and it's legal.

But the interesting part is now, more anonymity.

it's simple

You can put layers in between, like a company owned by a company.

Hundreds of layers, hundreds of companies spread across different countries, like a giant spider web, with each layer increasing your anonymity.

Every layer makes it harder for enforcement agencies and others to get to the true owners.

But who will benefit from this?

It could be the company, it could be a specific individual, but what about us, the general public?

There is still no discussion at the global level about whether it is permissible to abuse the company registry in this way.

What does this mean for us?

There's a case I can't get out of my head, and I learned about it recently.

Ten years ago, a horrific fire broke out in a nightclub in Buenos Aires.

on the eve of new year's eve

There were 3,000 people reveling in the club, mostly teenagers, cramming the 1,000-person space.

And then tragedy strikes: fires break out, plastic decorations melt from the ceiling, and toxic fumes fill the club.

Everyone tried to get out, but some of the fire doors were chained down and wouldn't open.

over 200 dead

700 injured during evacuation

As victims' families, cities and countries are devastated by shock, investigators begin searching for who is in charge.

However, the owner of the club that was tracked down was a dummy company.

In the end, various people were prosecuted, and some were sentenced to prison terms.

But it was a tragedy, and it shouldn't have been so difficult to determine who was responsible for such a fatal accident.

In this day and age, so much information is out in the open, so why is it that important information about who owns the company remains hidden?

Why are tax evaders, corrupt government officials, and arms traders allowed to hide their identities from the general public?

Why is this anonymity an accepted business practice?

Shell companies may be commonplace now, but they weren't originally.

Once upon a time, companies were founded to challenge innovation while minimizing risk.

By being a corporation, we limited our financial risk, and the corporation was never meant to be a shield against moral responsibility.

The company does not assume anonymity, nor should it.

So my wish is

My hope is that everyone will know who owns and controls the company, and I don't want the company's anonymity to be used against the public interest.

Together, let's ignite global public opinion, change laws, and usher in a new era of business disclosure.

What kind of era?

For example, you can look up the true owner of a company on the Internet.

The idea is that this data will be free and open to the public, accessible to citizens, businesses and law enforcement agencies around the world.

Think about what a change this would bring.

But how do you do it like this?

there's only one way

Together, we'll change laws around the world, create public registries, and make companies' true owners public, accessible to everyone, and loophole-free.

It's an ambitious plan, yes, but there's also momentum behind it. Over the years, I've seen what momentum can bring, and it's starting to happen on this issue as well.

Now is the chance

The TED community is a collection of creative, innovative thinkers and doers from across society, and you can make a real difference.

you can change

First of all, I'd like to ask you to join the Facebook page at the address above and support this movement and spread the word.

Our global activities will also gain momentum.

I would appreciate it if any of you engineers could help me prototype the public registry, and show the world how cool this is.

Activist groups around the world are coming together to tackle this problem.

The British government is already on board, supporting these public registries.

And just last week, the European Parliament took the same position, voting 600 to 30 in favor of the Public Registry.

it's really gaining momentum

(Applause) But we're just getting started.

We need the United States to join us, and so do many other countries.

To be successful, we have to pull together and inspire our politicians, otherwise we can't make this grand, world-changing change happen.

This isn't just about changing the law. It's about starting a dialogue. What can companies do?

This is not a dry policy story.

It's a human problem that affects everyone

It's also about being on the right side of history.

Global Citizens, Innovators Business Leaders and Individuals We Need Your Help

Let's start this global movement together

Let's do it and let's get rid of the dummy companies

thank you

(applause)

think of me as a student in my lab

The challenge for you is bionormative design

The theme of the task is to create a parametric 3D dynamic contact model.

In layman's terms, it means I want you to help me build the legs.

This is really difficult and I really want your help

Of course, we have prizes as well.

It's not like a TED award, it's an original T-shirt from our lab.

Please send me an idea to make legs

Let's list what you need to design your feet

First you need to know what a foot is

If you look up the translation of foot in the dictionary, it says "the part below the ankle, step, the bottom" This is the conventional definition.

However, this does not constitute research

I need to research what is known about feet in the literature

So let's take a look at the literature.

The problem is that there are so many types of feet

Then what should we do

We need to find out all the types of feet and investigate on what principles they work

While watching the following video, what kind of principle is there?

Think about what kind of experiments you're going to do to discover the functions of your feet.

Were there any common themes? principle?

what should I do?

What kind of experiments do you do?

Great, through my research in animal kinematics, I was able to draw a blueprint.

This is a naturally learned design, and it's not just an imitation of the foot you just saw, it's a combination of different kinds of foot secrets.

animals can go almost anywhere

As we saw earlier, any change in the probability of contact, the instability of the surface itself, or the stability of where you place your feet will allow you to move around the surface.

If you're going to study the workings of your feet, you have to simulate all these different surfaces, or things like gravel falling on them.

So here's the actual experiment, a random animal, here this brown spider, running on a surface that eliminates 99 percent of the contact surface.

Still little impact

If it were the size of a person, it would be traveling at 300 miles an hour.

How are you doing? please pay more attention

If you slow it down by a factor of 50 you can see how your feet are using the simulated gravel.

touching the ground

I think you've noticed that the whole leg is in contact with the ground rather than the toes.

Ground contact features for walking are distributed across the leg

You can also experiment with cockroaches. You can see a section from the foot.

I'm turning the cockroach now, so please take a look at the cockroach's legs

What happens when you pick one? still the same speed

Even if there is no knot, there is no effect.

There is no need to worry about the joints on the legs of cockroaches as they grow back.

How are you doing?

Please take a good look. It's slowing down to 1/100 How are you using your remaining leg?

I use the whole leg in the same way, super effective.

The next question is how common is functional distribution across the leg?

I was blown away by the next animal to show

Journalists, please do this off the record

take a look

A bipedal octopus disguised as a rolling coconut

Discovered by Christina Huffard, shot at Sea Studios, here in Monterey.

Other bipedal octopuses have been found

This is when it turns into seaweed

It camouflages by raising the other leg while walking on two legs.

(Applause) Look at the way your feet move over rough terrain.

It's as if there are no obstacles because you are using the whole foot so well Really great

Escher painted this picture in 1951, probably intending to paint a completely fictional animal.

You could say that art imitates life Three million years ago, nature evolved the following animals:

It's an animal called a mantis shrimp, which is similar to a shrimp.

This is the ultimate example of decentralized foot function, with the entire body acting as a substitute for the foot.

The first important feature to add to our blueprint is to have a point where you can touch the ground, not just your foot.

It's about distributing it all over your legs and then your body.

Can you design a new robot with this?

A brilliant engineer has spent the last few years building the next bio-native robot called RHex.

RHex's feet started off as a fairly simple shape that was tuned over time to finally become semi-circular

Watch the video to see why

See how you use your entire foot to walk over difficult terrain

Can you see that the whole semicircle is used as a leg?

Even when I overcome this obstacle

Obstacles falling here

No need for detection, control is achieved by the shape of the foot itself

simple, sophisticated and beautiful

What else did you notice when you saw an animal running over rough terrain?

Ask your assistant to help you

When I touched the leg of the cockroach... Mike please

What was it like when you touched a cockroach's leg?

Have you noticed anything?

boy: thorny

Yes, there are thorns. There are a lot of them, right? it hurts

Let's give it to the curator and see if he has the courage to touch the cockroach

(laughs) Chris Anderson: Have you ever touched it?

If you look closely, you can see that it has thorns, and until a few weeks ago no one knew what the thorns did.

The role of thorns was thought to be a sensory organ that protects them from foreign enemies.

I was able to figure out other roles. . This is an enlarged part of the thorn

In one direction, it is softer, making it easier to lift the foot.In another direction, it is stiffer, so it can pick up unevenness on the surface.

Crabs usually move on sand, so they don't miss a step until they're brought to the lab.

You're going to have a hard time with a net like this, because it doesn't have thorns.

Crabs don't have spines, so they can't cross surfaces like this.

I can artificially make these thorns and do something for them.

It catches obstacles when you step in and makes it easy to get out when you pull out.

We attached these spines to the legs and had the crabs try them out.

Was this thinking correct? was correct

The video is 1/20th speed, but the crab does not care about obstacles

(Laughter) (Applause) A step forward from nature.

Adds special spikes to blueprints

Can I make a robot that is good at climbing with this?

It's RHex again. I'm having a hard time getting over the smooth rails

It's time for the thorns. My colleague Dan Kodisek

I put nails in my feet at the University of Pennsylvania and now my RHex climbs over the rails without a problem.

how are you doing

Let's slow down the video and see what happens

You can see that the rail is caught by the thorns when the foot is about to step in

Previously it was only sliding and could not catch obstacles

Let's see it again. success

Distributing the function of the legs and adding spikes doesn't mean you can climb a vertical wall.

it's very difficult

But this animal does it so easily

The animal you're spinning right now is climbing a wall made of sleek metal.

The speed is amazing, but if you slow down the video, you'll see an amazing sight.

When I unlocked the secret, I slipped and climbed in a way that I can never say is beautiful.

I will climb this plane as if I were swimming

When you actually model it, the motion in the liquid is the best match.

Distributed foot functions act like paddles

It's the same when this lizard runs over quicksand.

look at your feet

They act like paddles on surfaces that you would normally think of as solid.

A former student of mine made similar findings in his study of lizards walking on water.

Can this make a better robot?

Martin Buehler of Boston Dynamics took this idea and evolved it into Aqua RHex.

Here's an RHex with a paddle, which makes it a pretty good swimmer.

For rough surfaces, animals will use their claws

I think I was able to feel the claws when I picked it up.

did you touch it?

CA: touched

animals use their claws quite skillfully

I'm working with Mark Ktowski at Stanford University, and he's a pretty awesome engineer, and he's created a manufacturing process called shape deposition, which allows you to embed nails directly into artificial feet.

Here's an early version of the new robot I'm about to show you

Add claws to your prototype blueprints

Animals are designed to be able to walk on any surface.

These are all taken from different insects.

Ant is climbing a vertical plane

let's take a closer look

It's an ant's leg. You see hair and nails and this weird thing

this is when the feet are in the air

When my feet climb on the sandwich I'm about to eat

It will be like this

Something like a meat ball with glue will come out

Let's look at it from below.

jump out

An ant that was difficult to photograph is climbing the string

it was hard

If you look closely, you can see the glue coming out like this

It turns out that this glue is a two-phase mixture with interesting properties.

It has enough holding power to stick an ant

Adds glued paws to blueprints

This seems to be sufficient for smooth surfaces

there was something better

Geckos are a good example of nanotechnology being used in nature.

this is the foot

They look like they don't belong on Earth, but the reason they stick together is because of their hairy toes.

A gecko climbs a wall at 1 meter per second and takes 30 steps in 1 second. It's unstoppable speed

If you rotate the video slowly, the legs will attach in 8ms and unlatch in 16ms.

If you look closely at how to remove it, it is quite strange

I'm peeling it off as if I was peeling the sellotape off the wall

Weird, isn't it? How are they stuck together?

If you look at the legs, they have leaf-like structures called linalae that are covered with hair.

If you look at the ends of your hair, you'll see a lot of split ends.

A single hair has hundreds or thousands of branches.This is the secret to getting close.

A single gecko has hundreds of millions of 200 nm long split ends

Instead of sticking with principles like glue, magnetism, or Velcro,

Stick together by intermolecular force

Add split ends to blueprints

Happily, we have successfully patented a self-cleaning dry adhesive.

This is nature's simplest example, and this is my collaborator Ron Fairing's synthetic polyurethane prototype.

This is the video when I tried to load it for the first time.

Interested in various fields

I think you can come up with any number of uses.

There are many people who came up with it and are excited about commercialization

I imagined different products. For example this bionormative plasters. Peel off the adhesive from the band-aid

I tried attaching 3 maki gecko hairs that have been regrown

This is a college student volunteer. There are 30,000 students, so there are plenty of options. That's a red marker.

Firmly fulfilling the function of a band-aid

It has good air circulation, can be easily removed, does not damage the skin, and can be used underwater.

It's a great example of how something that started out of curiosity, when I just wanted to know how it climbed, turned into something unexpected.

It's also a good reason to fund research that starts out of curiosity.

I am removing a band-aid

I redefine what a foot is

The question is, have we taken what we've learned from the natural world and applied them to design better feet?

As a new project, I created the world's first rescue robot that can climb a limited environment without using magnets or suction cups.

A development team of talented biologists and engineers is building this RiSE, which means Climbing Environmental Robot.

This one

A six-legged robot with a tail. fence and tree

And now I'm trying my first slope

Do you get sound? Also listen to the sound of the climbing

This is me climbing the wall for the first time

The one I'm using here is a freshly made leg with the simplest structure.

I think the mechanics are solid

Mark Cutkoski is trying to stay one step ahead

This is a person who makes legs using the shape deposition method.

The next step is to create the toes that follow the shape of the ground, add claws and thorns, and attach them with dry glue.

First, solidify the shape of one leg and toes and try to climb with it, then attach it to the robot

he proceeded with his research

He built legs for a bionormative climbing robot

Here's the design that Katkosky and his students created

It has six pre-adjusted toes, and it's based on the blueprint principle I've been talking about.

So it doesn't use glue, it doesn't use air suction, and if you attach it to a robot, it will be able to climb any surface, just like the animals that helped discover the principle.

Climbing the side of a building at Stanford University

The video is sped up

It just looks like the legs are climbing. Did you see them sticking together?

The structure of the thorns on the legs, the suction pad, and the hair that sticks to the suction pad by intermolecular force allows it to hold on to uneven and difficult surfaces.

Here's the 20x speed test video Can you imagine climbing upstairs to rescue someone?

It doesn't seem impossible

It's certainly difficult, but research continues

The secret of the design of the foot was derived by referring to the foot in the natural world

I've learned to let the parts that are best suited for the job handle the control.

Instead of letting the brain do everything, it's controlled by well-coordinated legs and body shape.

Nature provides hybrid solutions that can adapt to different aspects of integration.

Thirdly, I think that we should not just imitate nature, but should try to derive the principle, stimulate ideas, excel in engineering, and, if possible, come up with solutions that have the potential to surpass nature.

The message is clear: whether you're doing basic research on unexpected animals, building a rescue robot that can be used in an earthquake disaster, helping people in a fire, or researching medicine, you have to preserve the design of the natural world.

Don't let the key to the secret disappear before you can research it

Thank you for listening

(Chris Anderson) Citizen Rights — The Future of the Internet

Let's welcome to the TED stage the man behind these revelations, Edward Snowden.

(Applause) He's far away from here somewhere in Russia, and he's operating this robot on his laptop, and he's looking through the robot's eyes.

Welcome to Edward TED

What do you actually see from there?

(Edward Snowden) Everyone can see

It's amazing

(Laughter) (Chris) I have a few questions for you.

You've been called many things over the last few months.

Whistleblower Traitor Hero

How would you describe yourself?

CA: Everyone who joins this debate seems to be struggling with who they are, who they are, who they are, and how they position themselves.

you shouldn't worry about that

It doesn't matter who I am

If you say I'm the worst person in the world, just hate me

What really matters is the issue I raised.

What really matters now is what kind of government, what kind of internet, what kind of human-society relationship do we want?

That's the direction I'd like the discussion to take, and that's becoming more and more common over time.

If I were to describe myself, I'd be a "hero"

I don't use words like "patriot" or "traitor."

I am an American and a citizen just like everyone else.

CA: For those of you who don't know the full story, -- (Applause) A year ago at this time, you were in Hawaii working for the NSA.

As a system administrator, you had access to the system, and you began to provide some sort of top-secret document to a handful of select journalists, which led to the disclosures in June.

What was your motivation for doing that?

CA: Well, when I was working in Hawaii, and a few years before that, when I was working in the intelligence community, I saw a lot of disturbing things.

In intelligence, we do what we need to do — we do a lot of good things that are good for everyone.

But I went too far

Things are being done that shouldn't be done, important decisions are being made in secret, without people's knowledge, without the consent of society, and even our representatives, our legislators, are not informed about these programs.

As I began to think deeply about this problem, I wondered: How can we take the most responsible actions to minimize risk while maximizing the public good?

I've considered a number of options, including public disclosure in Congress, but I was concerned that there was no legal protection for a single individual like me, a contract staff member of an intelligence agency, and that it would be buried with the information and never known to anyone.

But we do have the First Amendment, which guarantees the freedom of the press, so that we can report and challenge the government, but it also allows us to work hand in hand with the government to have dialogue and debate about how to bring important issues to the public without jeopardizing national security.

So I decided that working with journalists to get all the information back to the American people was better than trying to figure out how to make it public.

Nor did the feared risks -- the risks that the government exaggerated -- never materialized.

There's no evidence of any tangible harm, so I'm happy with the decision I made.

CA: Now, I'd like to show you some of the information you've uncovered.

Can you pass me the slides? I don't know if you can see it from over there, but there's a slide out.

Here are the slides from the PRISM program. Can you explain what this reveals?

(Edward) There seems to be a lot of confusion, so I think it's good to first talk about what PRISM isn't, so that people can understand PRISM.

There was a lot of discussion in America about metadata.

It was repeatedly explained that it was just metadata, and the legal basis was Section 215 of the Patriot Act.

What this law does is enable things like warrantless wiretapping and surveillance of phone records on a nationwide scale -- who called who, when they called, call records, who went where.

That's what metadata is

But PRISM is about content.

Through this program, the government can force American companies to do the dirty work for the NSA.

Some companies, like Yahoo, have fought back, but they've lost all of them in court, because it wasn't an open court.

All hearings were held in secret court.

One thing that really worries me about PRISM is that according to the government, 15 federal judges have reviewed those programs and found them legal. But what they're not telling you is that they're being conducted in closed courts, by closed judges, based on closed interpretations of the law. There have been 34,000 warrant applications in the last 33 years, and only 11 of those applications have been denied by the government in the last 33 years.

You wouldn't want them to decide the role of American corporations in a free and open Internet.

CA: Now, on the slide that's coming out, you've got dates on which internet companies joined this program and when they started collecting data.

All the companies deny working with the NSA.

How was the NSA collecting the data?

CA: The NSA slide says "direct access."

For an NSA analyst like me -- from Hawaii, who analyzes data for hackers and others in China -- what "direct access" means is taking the data directly from the other party's server.

This doesn't mean that company representatives are sitting in a smoke-filled room huddling with the NSA about how to hand over their data.

Each company responds differently

Some companies have a lot of responsibility

Some companies are somewhat lighter

The bottom line is, in terms of how the information traveled, it all came directly from the companies.

It wasn't intercepted from the network.

But it's worth bearing in mind -- it's no use trying to get companies to try to fight back, make demands on the government, make it through the courts -- to make sure there's some kind of legal check and justified handover of user data.

Even if companies co-operate with the NSA in a coercive and legal way, the NSA will never be satisfied with that, so I think companies need to do all they can to represent the interests of their users and to represent their rights.

Over the past year, the companies on the PRISM slides have made great strides in that regard, and I hope they continue to do so.

CA: What else should companies do?

Edwards: The most effective thing American internet companies can do right now to protect the rights of the world's users, without consulting a lawyer, is to enable SSL and encrypt all web access.