

Single use plastic ban



Single use plastic items are low capital cost, but have a significant environmental impact as they don't break down for centuries. This has had a particular effect on marine wildlife.

Some jurisdictions have banned single use bags and drinking straws. Others have banned *all* plastic, single use items.

Consider

- Will this lead to people carrying more with them (steel straw, etc.), or will people move to eating-in more?
- Does this trend affect anyone negatively? If there are no straws available, will disabled people be further disadvantaged? How do you feel about this?
- How much further should this be taken? What else should be banned? What should *not* be banned?
- If plastic from one country damages the ocean wildlife from another country, what should the wronged country do?

Micromobility

Micromobility is The Future of Vehicles <<https://medium.datadriveninvestor.com/micromobility-is-the-future-of-vehicles-220c2c0c9b0>>

Micromobility is the use of any vehicle under 500kg. This encompasses everything from rollerskates to golf buggies, but generally is used to think about the range between kick scooters and ebikes.

It's often described as part of a city wide mobility strategy. If a city has a lot of electric scooters, then a 1km scooter to a bus stop isn't so bad.

Most dockless schemes are private, and have met with very little success (bikes or scooters). Docked systems are usually run by cities and are less chaotic, but also less useful (the bikes aren't where you need them to be).

Consider

- If you don't need to drive a car on a road, how would it change that road?
- Will we ever stop putting dockless scooters into trees?
- How far would you scooter to join an Uber Pool trip?



The gig economy



Most people tend to work for one employer, and then they will move from project to project for the same employer. The Hollywood model means that you complete a project and then go back into the market for employment.

Its a bit like being a freelancer or consultant. People in this system get regular price signals about their economic value. ‘Stars’ will be paid a lot, but if you aren’t really in demand you may struggle to get a job.

These sorts of jobs offer very accessible employment, at the cost of long term precarity, i.e. very little stability in their financial situation.

This may erode certain employment benefits that have traditionally existed. It also allows really talented people to maximally realise their value.

Consider

- Can humans be trusted to manage their own retirement funds, holiday allowance, etc?
- Would you be able to process the price signals well enough to get the best out of life?
- What will it mean for companies?¹
- How does everyone employed as an individual ‘contractor’ improve or affect our economy, society, built environment?



Lab meat



Ruminants, like cows and sheep, emit a lot of greenhouse gasses. They are also sentient beings. Those are two pretty compelling reasons not to eat them. However, meat is a dense source of calories, protein and vitamins. If we can culture meat in a lab, then we can have all the upsides without any of the downsides.

Consider

- Will we start to design meats that aren't copies of animals?
- Will lab meat ever overcome the yuk factor?
- What will happen to the meat industry? What about the animals that are already alive?
- What will we do with all the spare land that is freed up?



Drone delivery



On the surface, drone delivery is about pandering to rich people's whims. "I want a [insert thing here] now! Minimalism has been described as a thing that only the rich can afford—everyone else needs to have backups!² That could change if drone delivery takes off in a big way. You needn't actually own anything because it could be delivered to you within a few minutes.

The resources needed for everyone to own a ukulele could be put into making a few really good ones with energy left over to make other things.

Drones could also be used to deliver medicine and other essentials to places that don't have fixed infrastructure like roads or power for refrigeration. E.g. taking a shepherd's insulin to her on the side of a hill.

Consider

- How many of your belongings could you live without if just-in-time delivery was possible?
- Can medical assistance be 'delivered'?
- What things of yours would and wouldn't you share if a drone would pick it up and drop it off for you?
- What other infrastructure does this make obsolete?
- Could deliveries be made to apartment windows on high levels? How would the window need to change?



Return of the face lift



More invasive procedures

Brazil <[https://en.wikipedia.org/wiki/Brazil_\(1985_film\)](https://en.wikipedia.org/wiki/Brazil_(1985_film))>

such as surgical facelifts will regain popularity – people are tired of paying over and over for fillers³, which is more like a subscription model. Superusers say a

surgical facelift is cheaper in the long run, and forecasts seem to be aligned with them, as the plastic surgery sector will continue to boom overall.

Consider

- beauty standards are variable, is doing something permanent a risk?
- has the facelift got too much of a bad reputation from 80s stars who look bad in their old age?
- How would this trend generalise to other things? The permanence is embraced in tattoos already?
- how does this sit with trends towards body positivity?



China power shift

China's status as an economic, political and cultural center will continue its meteoric rise. The US will continue its downward spiral. Chinese consumption patterns will set the tone⁴ for the world.

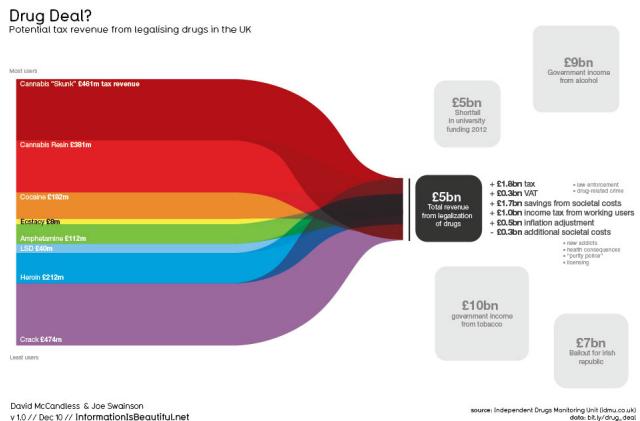
Consider

- Is it inevitable that China will take the USA's place as the leading global power?
- Is there only room for one, or can China, the USA and Russia exist peacefully as equals?
- China's culture is quite different to the USA's, what will that culture look like when it's overlaid onto the 'Americanised west'?





Legalisation of drugs



The Nutt report⁵ proposed a list of drugs in their order of harm to society. In this future, the discussion resurfaces and the Government decides that it needs consistent legislation.

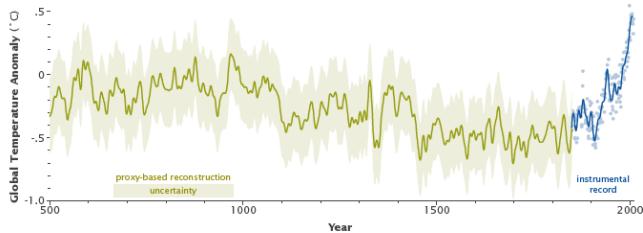
Proposals to ban alcohol are quickly put down by the drinks industry, and so to provide consistent legislation, all drugs from position 5 and below are legalised.

1. Heroin, 2. Cocaine, 3. Barbituates, 4. Street methadone, 5. Alcohol, 6. Ketamine, 7. Benzodiazepines, 8. Amphetamine, 9. Tobacco, 10. Buprenorphine, 11. Cannabis, 12. Solvents, 13. 4-MTA, 14. LSD, 15. Methylphenidate, 16. Anabolic steroids, 17. GHB, 18. Ecstasy, 19. Alykl nitrites, 20. Khat

Consider

- What else should be legal/illegal? What are you basing that decision on?
- What else could be legal or illegal in future?
- Why aren't these already legal?

Global temperature



This graph from NASA⁶ shows global temperature variation

"The paleoclimate record combined with global models shows past ice ages as well as periods even warmer than today. But the paleoclimate record also reveals that the current climatic warming is occurring much more rapidly than past warming events."

Future temperature rises differ by the model used to predict them^[^34] and by the way we act in the future^[^35]. These will lead to sea level rise. Partially from melting ice, but also from the water in the oceans getting bigger from thermal expansion.

Consider

- Who will warming be bad for?
- Who will it be good for?
- What will temperature increases trigger? And then what will those things trigger? and what will those things trigger? And so on.



Audio AR



Most Augmented Reality (AR) is

zombies, run! <<https://zombiesrungame.com/>>

thought of as visual, but there are significant technical hurdles in image processing and rendering to overcome before it has widespread adoption. Audio AR is already available; if you use google maps' walking directions through your headphones without looking at your phone then you've already tried it. (Many sports apps use audio cues to prompt performance too.)

For it to be audio, only the output needs to be audio, the input can be anything, GPS, accelerometers, microphones, even cameras.

"Hey Siri, who's that guy over there? Do I know him?"

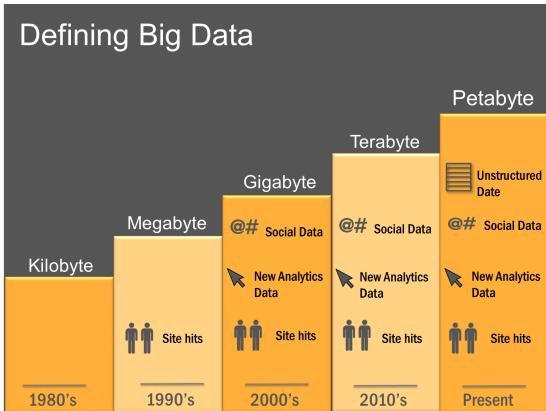
See the Ender's Game series for an audio AR, AI character.

Consider

- if you have an audio assistant that's able to understand the world, what would they need to be able to do for you to make it worthwhile?
- Historical characters like Jiminy Cricket or the angel and demon on your shoulders are prototypes for audio AR. What sorts of things could this system help you with?
- would it all be voice prompts? How else could you sonify the interaction?



Big data analysis



Big data analytics is the process of examining large data sets containing a variety of data types.

BIG DATA: to uncover hidden patterns, unknown correlations, market trends, customer preferences and other useful business information. The analytical findings can lead to more effective marketing, new revenue opportunities, better

customer service, improved operational efficiency, competitive advantages over rival organizations and other business benefits.⁷

The goal of analysis is for companies to make more informed decisions. They could use Web server logs and Internet clickstream data, social media content and social network activity reports, text from customer emails and survey responses, mobile-phone call detail records and machine data captured by sensors connected to the Internet of Things.

Consider

- How could this scale of information and its availability influence not just business but also society?
- Are there negatives to a society driven by 'big data' metrics?

Escape into fantasy worlds

Perhaps unsurprisingly, global uncertainty has led to a boom in escapism⁸, and all signs point to this continuing strongly into the next decade. Fantasy can and will take various forms, including long-form immersive gaming experiences, ketamine's recreational popularity and new acceptance as a clinical treatment, and increasing commercial emphasis on the worlds of young adult literature and its spin offs across media.

There has been an increase in people shutting themselves away, in Japanese, Hikikomori⁹, but at the same time the traditionally reclusive activity of gaming has become increasingly social, with streaming and multiplayer worlds.

Consider

- Virtual worlds could easily get interesting and immersive enough that people wouldn't want to go out into the world. Is that a bad thing?
- What would you need to inject into virtual worlds to keep their inhabitants function members of the outside society? Is that necessary?
- Virtual worlds don't need to be geographically bounded; would it ultimately break down the nation state?
- what things need to be done in the real world?



Tech platform exit

Consumer backlash against big tech has been heralded for years, but its widespread implementation finally seems likely. Mainstream awareness of the data power imbalance with big companies will make consumers happy to pay for things like search¹⁰, email and VPN instead of having companies use their data. Increasing attention to the power imbalances of this model will lead to the adoption of more niche services and platforms.

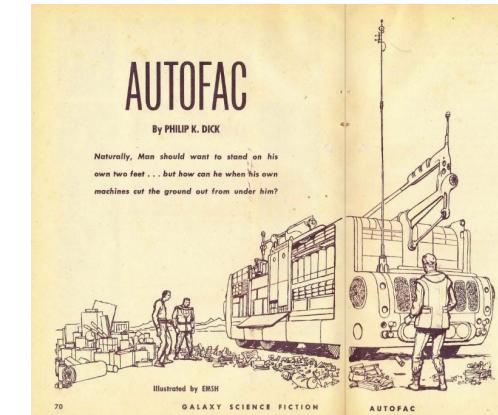
Twitter is investigating making itself somewhat obsolete by moving their platform across to a distributed protocol (like email is). This might become the future, but it's uncertain how it could be monetised with platforms running as businesses, rather than as utilities.

Consider

- Could you live without Facebook? Even Events and Messenger? What about Google?
- Could the fragmentation caused by exiting the platforms be overcome? Would it be a modern day Babel experience?
- what would fill the vacuum, how would it be different?
- Google and Facebook have threatened to pull out of countries with policies that are opposed to their operational policies, e.g. Australia and China. Do we see an unevenly connected world?



Amazon Nations



The relationship between enormous corporations whose resources increasingly dwarf actual countries and small countries in need of debt relief will lead to

unusually baroque tax-evasion schemes and complex international monopoly issues¹¹.

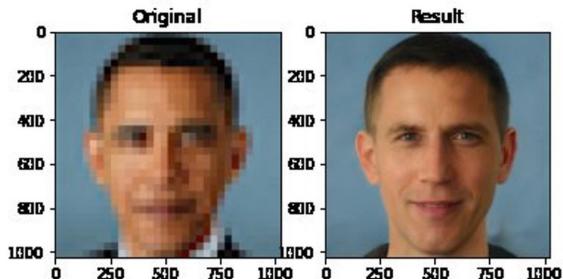
Philip K. Dick predicted this in *Autofac*¹², and there's precedent with the British and Dutch East India Companies, and Unilever in Nigeria¹³.

Consider

- Given how much more powerful global corps are than states, will we start to see them taking control of nations soon? Why would they get involved at that level?
- The nation is a relatively new concept; should we treat it as a permanent one? What other models could supersede it?



AI Bias



The PULSE algorithm takes pixelated faces and turns them into high-resolution images. However, it has a strong bias towards white faces. ∴ Obama -> white guy. *The Verge* <<https://www.theverge.com/21298762/face-depixelizer-ai-machine-learning-tool-pulse-stylegan-obama-bias>>

Bias can be built into algorithms in several ways. The obvious one is through the datasets used to train the system. If a dataset has only cats, it will classify a dog as a cat. It can also be introduced through the hyperparameters (the setup variables of the system).

Propublica¹⁴ showed widespread bias in sentencing based on an algorithm that baked in, amongst other things, geographical biases, e.g. if you live in a black neighbourhood, sentence more harshly.

Many ML algorithms are considered “black boxes” so can’t be explained. There is a lot of work on trying to make that not the case.

Consider

- Whose responsibility is it to make sure that algorithms don’t discriminate against particular groups of people?
- Is there an acceptable rate of failure? What is that relative to the human rate of failure?



Live shopping

Live shopping¹⁵, already extremely popular in China, is like Instagram Live meets the Home Shopping Network – influencers show-and-tell products live on

social media, which have particular discounts and promotions only while the feed is rolling. Forecasters predict this will become globally popular¹⁶ in the near term.

Consider



XYZ as a service



Anything you can do or own yourself can probably be provided as a service¹⁷ to you. Gmail is the most obvious example: email as a service. People tend not to have a well at their house, they get water as a service.

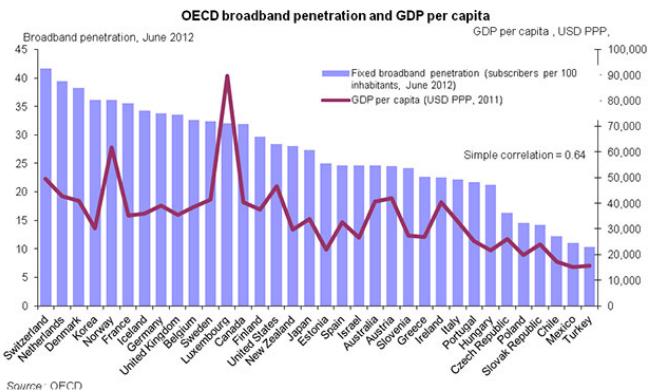
You can get computing and storage as a service from AWS. X as a service also applies in the physical world. Uber and GoGet are examples of transport as a service.

Consider

- What advantages are there for rolling your own?
(This mean not using x as a service, but making a version of that service for yourself.)
- What can't be turned into a service and why?
- What will people do when they have a service for everything?
- What do you own/do that could be provided as a service?



Ubiquitous broadband



Broadband internet unlocks so much of our urban economy in the developed world but that is a small part of the earth's surface.

What would access to broadband do for rural African farmers, or for Antarctic explorers?

Google had project Loon, Facebook tried giant autonomous planes that act as repeater stations to the ground. SpaceX *is* putting a network of toaster-sized internet-satellites into orbit and .

If everyone in the world has access to the same markets it would have a huge levelling effect. It might raise the incomes of the poorest, but it might well lower the incomes of the most well-off.

Consider

- What can you do with fast internet that you can't with slow internet?
- Could the world's best robotic surgeons operate on the cases that most needed their help, regardless of how close they were to a big hospital?
- Could low income Indian children get educated by the best teachers?
- Could Ethiopian graphic designers sell their expertise to Chilean wine producers?
- What are the exponential potentials with this card?
- If broadband is ubiquitous (e.g. available in national parks), will it be possible to get away from it? Is this a good thing? Is it a technology problem or a social problem?



Advert free internet



The dominant business model of the internet is making a service that people use, and then serving adverts to those people while they're there. If you could opt out of those adverts there would need to be some other kind of value transfer to make the service worth running.

Each time an ad is served (an impression), it costs the advertiser a tiny amount of money, more if it's clicked. These sums would be dwarfed by transaction fees as an impression is in the order of \$0.012 per impression and

a transaction fee is somewhere between \$0.03 and \$0.30. So the payments would need to be aggregated by another party before being passed to the banks.

Companies like Blendle¹⁸

Consider

- Would you pay money to avoid adverts?
- Adverts make you aware of products and services that potentially make your life better. Would you suffer without them?
- How would graphic design trends change if there was less to put on the page?
- If the wealthy paid not to see ads, would ads change? Wealthy customers are worth more to advertise to, would people need to pay a % of their wealth to avoid adverts?

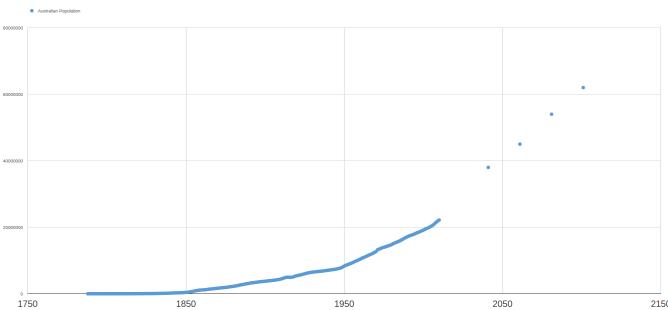


End of the open-plan office

Consider

Besides being notoriously difficult for concentration and privacy, an airborne pandemic has lessened the appeal¹⁹ of cramming big groups of people shoulder to shoulder in a single room.

Population growth rate



The world population is growing by 200,000 daily. 20
Population increases are expected to level out
globally between 2030 and 2100²¹, but that's an
aggregate value. Some countries will still be growing fast
whilst others will be shrinking (looking at you Japan).

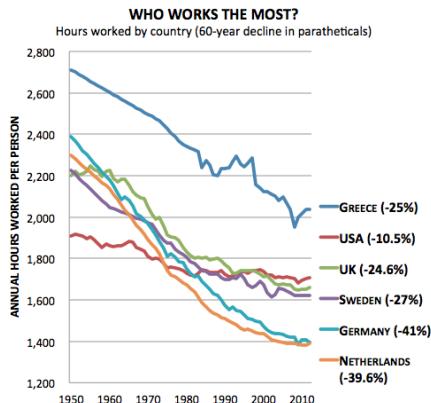
There are a lot of factors to population growth. Better
sanitation means fewer children die. Better access to
education for women means that fewer children are
born. People living longer means that people hang about
for longer. Wars push people out of countries, prosperity
pulls them in.

Consider

- What job will all these new people do?
- What will they eat?
- Where will they live?
- What factors will drive migration?
- What limiting factors are there on Australian population growth? What could we do to remove those limitations?



Working hours



Managers and professionals showed strong reductions in hours worked between 1996 and 2010 according to the ABS *Trends in Hours Worked* report[^27].

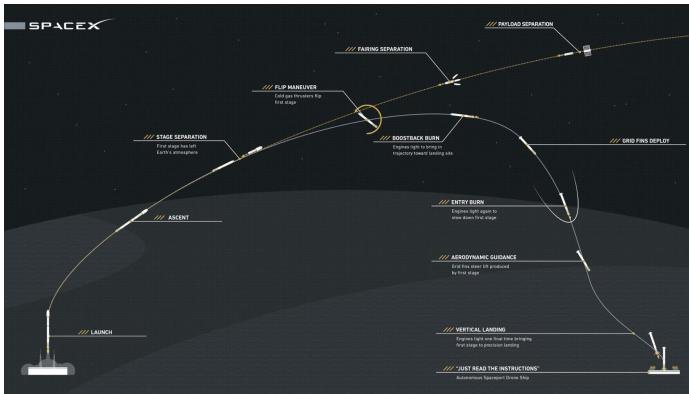
Although it might not feel like it to us, the trends seem pretty clear, assuming that some other force doesn't come into play in the future.

This doesn't cover people who work multiple jobs and/or work for themselves (which could be entrepreneurs, or it could be Uber drivers).

Consider

- John Maynard Keynes thought that we'd be working a 15 hour week by now[^28]. Will that come in the future? Will this downward trend continue?
- What else will affect working hours?
- Working hours only capture work in paid employment. What other kinds of work are there and how much of them are we doing? (volunteering, housework, etc.)

Cost of space travel



The average cost of traditional launch methods is about \$25,000/kg²³ but the SpaceX Falcon 9 can get that down to \$2,618/kg. The Falcon Heavy is expected to be able to launch 53,000 kg to Low Earth Orbit for \$90 Million or US\$2,350 per kg to LEO^{24/25}.

With fully reusable launch vehicles the cost of a launch will drop to almost the cost of the fuel. As rockets are fuelled with hydrogen and oxygen, this can be made in bulk by electrolysing water, potentially with solar power. Expect the cost to launch to continue to drop.



Consider

- What other mechanisms might we use to get things into space?
- What will the price drop in space travel mean for society?
- What limits the drop in cost of space travel?

Walking robots



Legs have lots of advantages over wheels. 2, 4 and more, legged robots are able to go places that wheeled and tracked vehicles can't²⁶. That means that

we can send robots to map remote places, or to navigate places designed for humans. (Or other legged things!)

Most of the current crop of robots have military origins, but they are also ideal of other types of hostile environments, like firefighting, rescue or space!

Consider

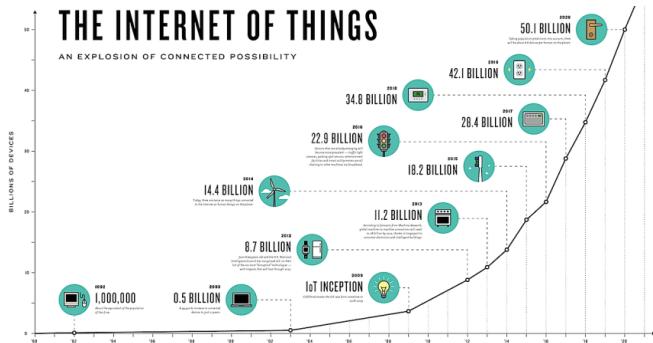
- What other sectors could these robots be used in?
- Wheels need smooth surfaces, legs don't. Will we need fewer roads?
- Does this have an outsized effect on humans' exceptional talent of mobility in difficult spaces? Will it affect employment?

Universal work from home policies

Consider

Remote work due to Covid-19 has exposed the inadequacies of compulsory office attendance; now that people are working from home, it will never go back to the way it used to be²⁷; geographical requirements around talent acquisitions will loosen or expand beyond urban centers.

Smart homes & internet of things



Legislation is already in place that all white goods will have wireless communication built in. That means that a central controller in your house will be able to tell your air conditioning to ease off a couple of degrees to reduce peak electricity loading.

The dream of smart refrigerators ordering more milk as you run out is getting closer. There are lots of other issues that are less obvious and less friendly about every

aspect of your life being instrumented. E.g. there have been lots of examples of smart home devices being hacked and used as spy cameras. Less frightening, but still annoying, a lot of smart devices stop working altogether if the parent company shuts down.

Consider

- Would you let a power company decide when you boil the kettle if it saved you money?
- Who would have access to data about your house? Who should?
- Would you like to be able to turn off your iron if you left it on at home? How about your lights?
- What if your smart lock company goes broke and you can't get into your house?
- How does this impact the built environment?

Indoor plant farming



Plants are green because they reflect the green part of the visual light spectrum; it turns out that plants need mainly pink light to photosynthesise. 1m of solar panels can generate more than 1m of pink light, so it's very resource efficient.

The plants are grown in racks, in a sealed warehouse. Each rack has lighting and a water supply with nutrients in it. Because the building is sealed, there's no need for pesticides because there are no pests. Because the plants are in racks, each square metre on the floor can produce tens of square metres of plants.

Consider

- If we do this, what will happen to the farming industry?
- What would happen to all the land that is currently used to grow plants?
- Not all plants can be grown like this. Plants that are tall are particularly unsuited, e.g. fruit and corn. How will our diets shift to reflect the price differences?





Rewilding



Depiction of some mammals common in northern Eurasia during the late Pleistocene, by Mauricio Antón. From left to right: wild horse, woolly mammoth, reindeer, cave lion and woolly rhinoceros. *Pleistocene Park* <[https://en.wikipedia.org/wiki/Pleis](https://en.wikipedia.org/wiki/Pleistocene_Park)

Cities and suburbs are looking for places to downshift development and add urban greenery²⁹ to compensate for rising CO₂ emissions. Especially if carbon sequestration is eventually monetized, this could have

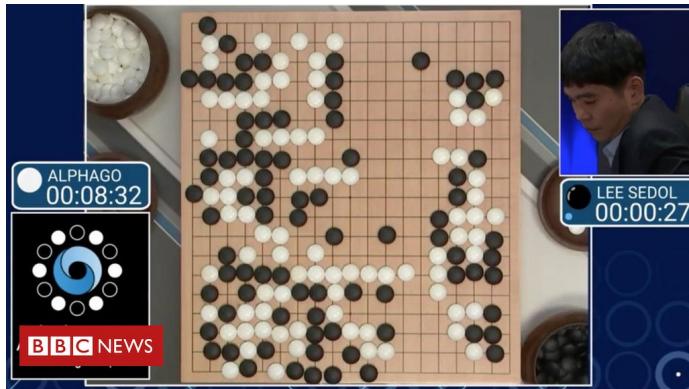
an impact on land use overall, since owning undeveloped forest land would be profitable. This permaculture land ownership.

Progress in ancient DNA recovery is leading some to suggest rewilding with currently extinct fauna³⁰.

Consider

- Will this lead to a sharper distinction between urban and wild?
- How will we interact with the apex predators (bears, wolves, etc.) that are needed for a functional ecosystem?
- Will governments need to compulsorily purchase the land from farmers, or will there be another way to incentivise rewilding? Maybe an emissions scheme, or fallow payments?

AI creativity



Artificial intelligence: Google's AlphaGo beats Go master Lee Se-dol Published 12 March 2016 [BBC <https://www.bbc.com/news/technology-35785875>](https://www.bbc.com/news/technology-35785875)

Algorithms like alpha go have been displaying signs of non-human creativity, i.e. they're doing things that their creators think are beyond the scope of their training.

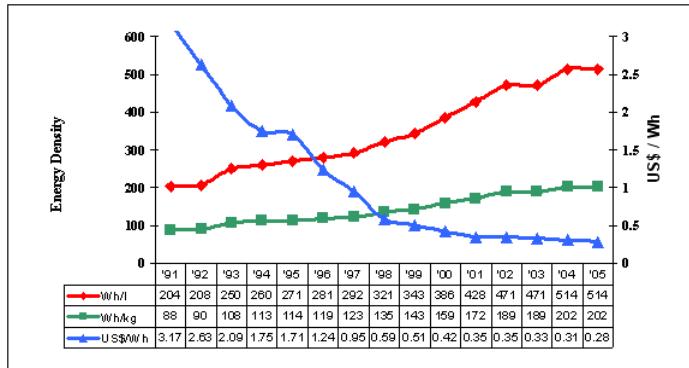
Other algorithms, like style transfer GANs, look creative, but are quite predictable. However they produce art-like outcomes which—it could be argued—is what most “creative” human “artists” do.

Consider

- What is creativity? Can it be defined in a way that doesn't involve humans?
- Can a machine think? If you take a pragmatist view, does that matter?



Battery density



battery statistics *battery university* <http://batteryuniversity.com/learn/article/battery_statistics>

The ability to store energy and then release it later has been a constant human obsession. Mill ponds are there to turn water wheels when it isn't raining and clocks run on weights and springs that release their energy slowly.

Chemical batteries make that energy portable in a way that was previously inconceivable³¹.

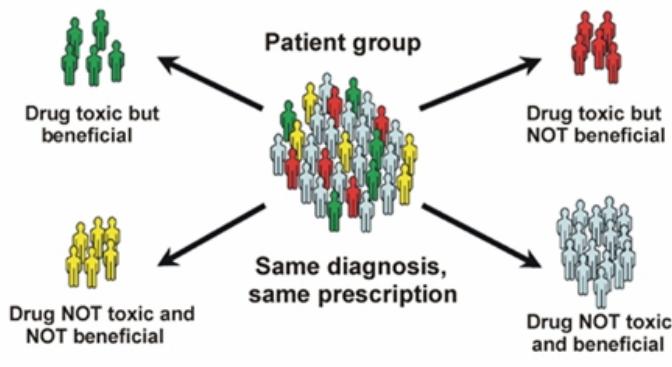
Tesla's PowerWall batteries allow solar power to be used at night, and the same batteries that are inside the power wall are used in cars. These allow the power providers to load balance/peak shave so that they don't need to turn on more power stations to handle peak loads.

Consider

- Peak loads cost power suppliers a lot of money, who else stands to gain from batteries apart from consumers?
- Will consumers prefer ever thinner phones or longer battery lives. What would life be like if you only charged a phone once a month?
- Will the distribution of metals that make up batteries change global trade/power?



Genetic medicine



Medicine has developed to a point where it is incredibly good at treating an imaginary, statistically normal person. Each variable that could be part of your health has a statistical range that is 'normal', perhaps subdivided by age, or sex, or race if you are lucky.

Genetic medicine is focused on treating each patient as an individual³². Those ranges would be hugely more specific. Based on your genetic markers you may need to keep your potassium levels between X1 and X2. This

leads to much more preventative medicine being possible. This ultimately reduces the spending needed to achieve a given level of health and also makes it possible to increase general health for everyone.

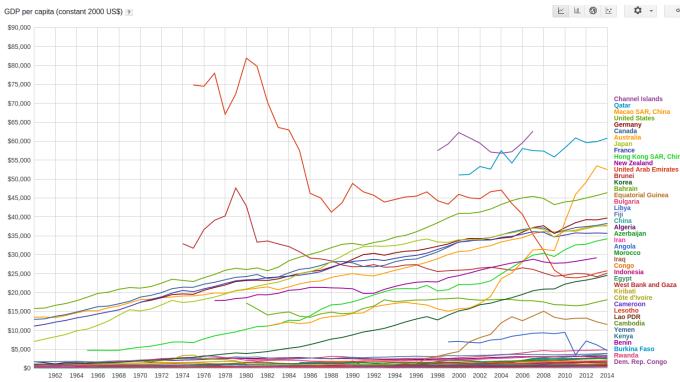
All that statistical specificity unlocks a dystopian side. Health insurers can make much more accurate predictions about the true cost of insuring a person. This means that people at risk of the worst diseases will also find it the hardest to get health insurance.

Consider

- Will this make us healthier?
- Will we choose mates who are genetically different to us, or to try to reduce the likelihood of complications?
- Will it lead to people being denied healthcare/insurance?



GDP



A lot of countries are getting richer. A few are getting poorer. A big slab of countries are staying the same.

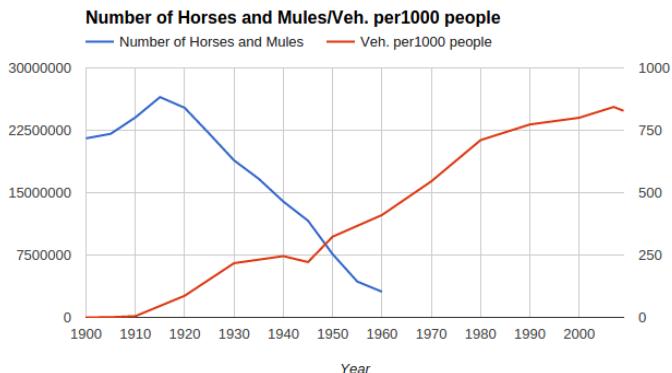
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Also, wealth distribution inside countries is changing.

Consider

- What causes there to be three groups?
- What do the countries in the three groups have in common? What do UAE, Brunei and Libya have in common?
- What leverage are the countries that are getting richer able to use that the countries that are static don't have access to?
- Is GDP even a useful measure? What would the world be like if we measured something else, or a range of things?

Horse population



The Horsepower was a measure of the work that one horse could do. The horse was the engine of most economies until the internal combustion engine displaced it. This was one of the first real examples of large scale disruption³⁴.

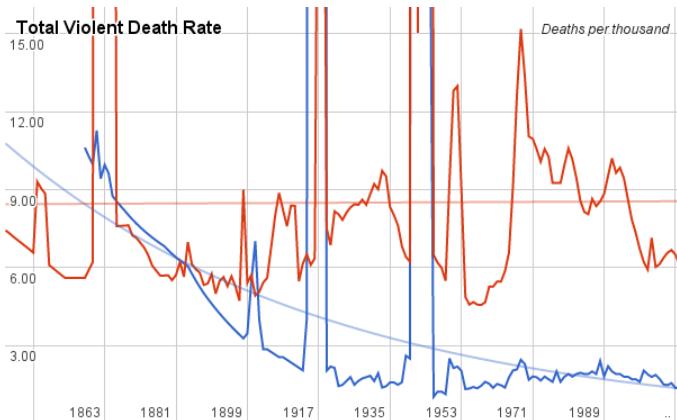
Horses were no longer a requirement, and people quickly moved over to engines to provide motive force. Horses stayed for recreational use, but in tiny numbers compared to their previous penetration.

This is interesting, but it's also a metaphor for a change from one entrenched technology to another. The disruption to the world can be huge.

Consider

- Why did people prefer engines to horses?
- What was the core function that the horse performed?
- If you think of this as a pattern, what might replace the car?
- What other historical technological revolutions fit the same pattern? What current technologies are vulnerable to it?

Crime/violence



Generally, crime and violence seems to be declining overall^{37 38}. This may be because of better policing, or more surveillance. It could just be that we are generally richer, and therefore we feel less

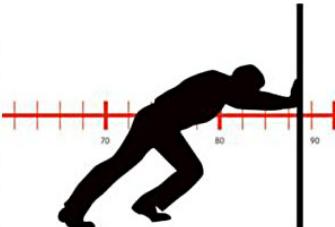
Australia is blue³⁵, USA is red.³⁶

compelled to risk committing crimes to obtain what we don't have.

Consider

- How much crime went unreported in the past? Has this amount increased or decreased?
- Has the Overton window moved to include new acts within the definition of *violence*?
- Are we less violent because we have ‘advanced’ as a society, or because we are more afraid of getting caught?

Radical life extension



The first children to get to 150 years old have already been born. Radical life extension advocates think that it's possible to push that number much higher.

Technically nobody dies of old age. They die of diseases that old age makes us more susceptible to. Life extension advocates extending the useful period of one's life to make 90 the new 40.

Immortal fictional characters often long for death, but usually because they are tired of their friends dying. If everyone lived a long time they would probably be pretty happy about it.

Consider

- What would you do with another lifetime?
- Which decade of your life would you like life extension to extend? Would you be in your 20s for 50 years? Teens? 40s?
- If you could push your healthspan, at the cost of your lifespan, would you? (I.e. live in a 25 year old body until you are 60, then drop dead.)

Digital commutes and forced mindfulness

Microsoft is introducing a “virtual commute” feature³⁹ intended “to create mental bookends for the remote workday”. It is also partnering with the meditation app Headspace to add a new “emotional check-in feature”.

Consider



Dark kitchens



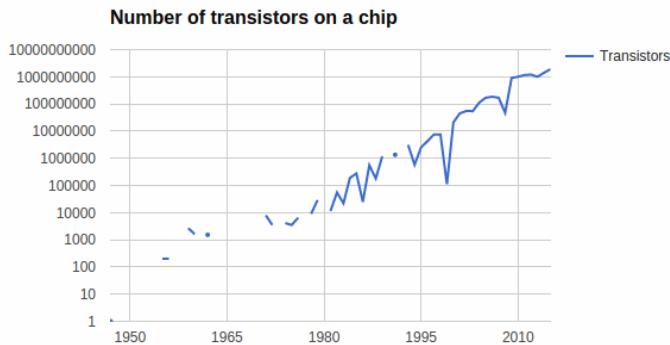
Dark kitchens create meals exclusively for the online delivery market⁴⁰. In the early pandemic many regular restaurants went dark only.

Dark kitchens have lower overheads, and can share a premises more easily, but they are at the whim of the delivery service for speed of delivery and the whim of the customer for presentation. This means that there will often be a significant overhead in packaging that can offset the savings from rent on the dining room.

Consider

- How much of eating out is about the convenience of not having to cook? Wash up?
- This increases demand for chefs, but decreases demand for waiting staff, what will those people do?
- Eating out is often a safe space for first dates, if the restaurant industry collapsed (or the low-mid price range did) what would that do to dating?

Compute power



The number of transistors on a microchip has doubled every 18 months or so since transistors were invented. This was first spotted by Gordon Moore, and the phenomenon is named after him: Moore's Law⁴¹. More transistors means more calculations can be done in a given time. That means that computers can do more of what we want, feel smoother and more responsive.

Not only is each computer more powerful, but there are also more computers in the world. We all have computers in our pockets. There are giant data centres

anywhere that a source of electricity or cooling can be found⁴². Put simply, there is a massive amount of raw computing power in the world, and the rate of its increase is increasing⁴³.

Consider

- Does more power unlock answers to new kinds of problem? Google search wouldn't be possible without a certain level of computer power. What new kinds of activity will be unlocked by more power?
- More compute power needs more electrical power. Where will this electricity come from?
- Does everyone have equal access to this compute power?
- Will we ever have *enough* computer power?



Wearable/implantable technology



Apple watches have FDA approved ECG capabilities, but its usefulness is disputed [9 to 5 mac <https://9to5mac.com/2019/07/30/apple-watch-ecg-2/>](https://9to5mac.com/2019/07/30/apple-watch-ecg-2/)

We are in the first flush of the wearable technology boom⁴⁴. The quantified self⁴⁵ that knowing your steps and heart rate allows for means that people can make more informed choices about their behaviour.

We are currently in a very naïve period of this trend. The things we measure aren't the important things, they are the things that are easy to measure. The feedback we get is distracting and doesn't allow us to be more present in our lives. In the next generation of wearable, or even implantable, technology, we'll be able to use it to maximise our health and wellbeing, and to be far more present than we currently are.

In vet science, there are sensors that sit in a cow's stomach that can relay back to the farmer the health of each cow. Humans have pacemakers, but non-therapeutic implantables are almost unheard of⁴⁶.

Consider

- What else could you measure and what would be the best way to do it?
- What would you do with that data?
- Who else would like to know that information about you? What information would you worry about if it was leaked?

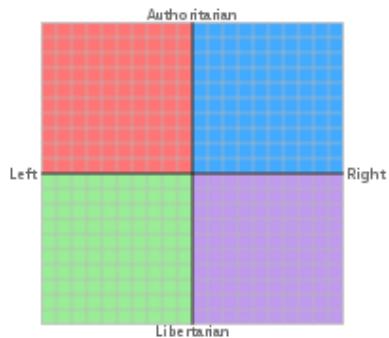


“Conservative” policy dominance



Right wing parties are usually characterised as being pro-business, and/or upholding traditional, often religious, values.

Consider

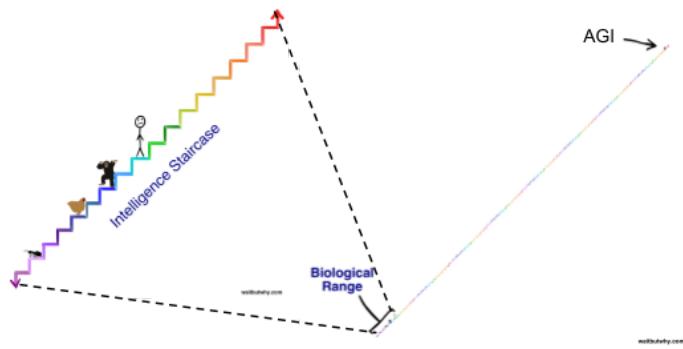


- What if Fox News became the only source of news?
- Most people take a view on what traditional values are good and should be kept, and are bad and should be thrown out. How do you draw this line yourself? Why do you think you hold these views?
- What is the correct pace of progress? Should we be radical or conservative with our choices? Do you apply that to all issues?

What if parties on the right had control? [Wikipedia <https://en.wikipedia.org/wiki/The_Political_Compass>](https://en.wikipedia.org/wiki/The_Political_Compass)

Many countries have a system of government that is split between right and left wing factions. It's increasingly difficult to say what these factions generally represent, but they are often captured on the political compass.

AGI fast take off



Specific—or weak—AI is useful for things like image recognition, or playing chess. Artificial General Intelligence (AGI) is different because it can solve general problems.

One of the problems that it is likely to want to solve is making itself more capable. In an AGI fast take off scenario, the AI will put all its effort into improving its ability. It may well start at dog level intelligence, and maybe over the next week or two it'll get to chimp level

intelligence. Within another day or so it'll get to a stupid human, and within a minute or two will have become far smarter than the most intelligent human ever to live.

This card gives you the choice of whether you want to assume that the AGI will try to kill us all, or if it'll think of itself as a loving parent to us.

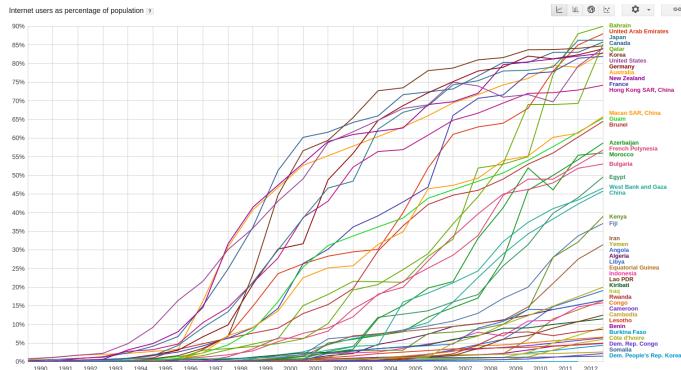
Consider

- Who “owns” a greater-than-human intelligence?
- Is it unethical to turn it off?
- What impacts would AI/AGI have on a future city or workforce?
- What if the AI’s motivations don’t align with ours? It’s much smarter than us, should we treat it as a god?





Internet coverage



In the last quarter of a century the internet has changed the way the world operates. Access to the internet isn't ubiquitous. A large part of the world can't access what we take for granted. Projects like Facebook's

[^30] Data from <<https://goo.gl/L3TER1>>

internet.org⁴⁷ and Google's Project Loon⁴⁸ were trying to change that but their parent company's deemed them unprofitable.

Those unconnected people stand to gain from internet access and are also a giant market. The countries at the bottom of this graph have little in the way of fixed infrastructure, so may leapfrog the countries at the top of the graph if satellite internet becomes the norm.

Consider

- What could a society do if the penetration was 100%? Online democracy? Compete in a global job market?
- What is preventing the last few % from being connected? Is it choice or something else?

Coworking and Cohousing

A significant proportion of effort in an office or a house is directed towards non-core activities. I.e. maintaining the photocopier or doing laundry.

co-x offers a more highly serviced environment with the opportunity to mix with other, in theory, like-minded people.

Those other people are the selling point and the major downside to this model. If you don't get on with your co-people then hell will be other people.

Consider

- What coordination benefits are there from sharing?
What can you do better in house?
- The inducements to co housing and working are often quite expensive, and counteract the efficiency gains. Is this something that you'd go for?
- The opportunities for increasing the service level are almost endless, how far can you imagine pushing it?



Death of music genres

Consider

Spotify's move toward mood-driven instead of genre-driven playlists has been successful to the point of suggesting that musical genres themselves will be increasingly outmoded⁴⁹ in the coming years – or at least completely illegible.

Drones



Let's define drones as a class of robots that are able to do a human's bidding with *some* level of autonomy. That might just be the ability to hover level, or it might be full autonomy over an assassination mission.

There are drones deployed in military situations, drones do the vacuuming, drones do aerial filming. The list of things that drones can do is only limited by how far we can imagine at the moment.

Most drones only have limited autonomy, but that is changing in military applications and will change in commercial and domestic ones too.

We can send drones to dangerous or inaccessible places. Wriggling into pipes to look for leaks, or flying over cliffs to count sea birds.

Drones were used to attack the Saudi Aramco oil refinery; this was consumer tech, used in a military context.

Consider

- What if drones get so small that we can't see them?
- Could warfare become entirely autonomous?
- What new types of jobs or applications might emerge for drones?
- Will drones displace a significant part of the labour force?



Self driving cars



From a long shot dream in 2004⁵⁰ driverless cars are now more of a *when* than an if.

Humans need a lot of tolerance to account for their imperfect driving skills. That means that the lanes need to be wider, cars need more impact protection, cars need to drive further apart.

Cars also represent freedom for a lot of people. Owning a car means that for a large proportion of the day each car is idle. When cars drive themselves it's unlikely that anyone will own a car. Cars will provide mobility. That

means that parking will be eliminated, freeing up almost half of the current road network and many structures currently dedicated to parking.

While not driving, people will be free to do other things. They could sleep, have meetings, eat, relax, etc.

"To generations of Americans, owning a car represented freedom. To the next generation, not owning a car will represent freedom."⁵¹

Consider

- Will this replace mass transit?
- Current cars are styled to face forwards, and to be a little bit like racing cars. What will future cars be like?
- What will this do to ownership models? Will it be transport as a service?
- What effect will this have on moral standards (drink driving) or sexual freedom?



5G/_n_G

How long to download a two hour film?



Wildly optimistic speeds, but in the rough orders of magnitude. *Do Yourself A Favour – Don’t Get A 5G Phone Just*

Yet <<https://whatphone.com.au/guide/dont-get-a-5G-phone-just-yet>>

Each increase in G brings a connectivity speed, and changes the types of things that you can do while connected to that network. 3G allowed full webpages rather than just WAP⁵².

5G untethers broadband speeds from the geographical constraints of fibre optic or copper networks. Once there's a 5G network in place, high tech applications can be set up with no digging, it also allows for easy reconfiguration of data rich robotics in warehouses (for e.g.).

Conspiracy theorists think it's a mind control mechanism.

Consider

- In the 2030s 6G will bring even faster connections, what will that allow
 - If you don't need to re-cable, what will this mean for factories? For offices?

Discovery of extra-terrestrial beings



You have one of the lucky-longshot cards!

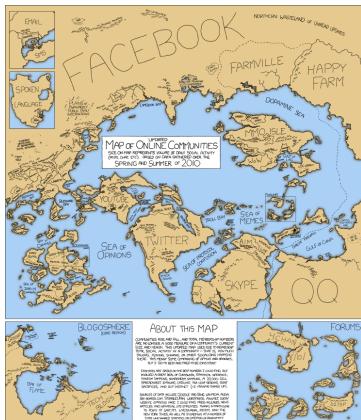
There's a lot of scope with this card.

Consider

- What would it mean to encounter an extra-terrestrial life form?
- Would it be sentient? Would it just be bacterial?
- Would it be friendly, aggressive, or maybe even just unconcerned about humans and other earth life?
- Would they give us new technology?
- Are there other ways to be alive? Think about slime moulds, trees, bees, the earth computer from Hitchhiker's Guide...



Private internet



Until the world wide web (www) became the dominant part of the internet there were lots of different ways that content could be shared. (Most of these still exist, but have comparable very small traffic.)

The internet is built out of open standards⁵³. The idea of a private internet is that a company with enough power will develop a rival information network with closed standards. The most likely candidates are Apple, Google and Facebook. For example, imagine that Apple

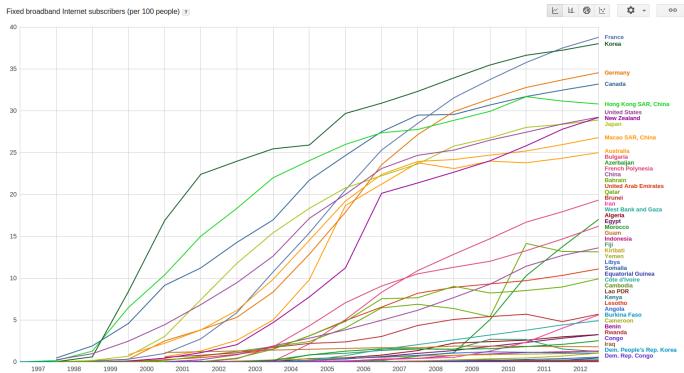
developed a fast data-transfer protocol that you could only access from an apple device. They would go on to create a walled garden of content that only apple users could see.

This would impede the flow of information that the internet allows, but it may create a better experience for a subset of the population[^46].

Consider

- Who would gain from a private internet?
- What would be bad about companies developing private protocols?
- Would it be safer and more secure?

Broadband access inequality



This is important because access to the internet gives citizens knowledge and power.⁵⁵ These numbers⁵⁶ are mainly growing across the board with a few exceptions.

- They may have reached saturation for developed countries. In these countries it may even start to drop as people start to use wireless internet instead.
 - In totalitarian countries access to the internet is restricted so they may not have the option to connect.

- In some developing nations they may skip wired internet all together and go straight to ubiquitous wireless internet.

Having access to the internet unlocks economic and trade goods, education, political information (that may contradict official sources) and generally raises quality of life.

Consider

- Will wired broadband still be needed if we have fast satellite connections?
 - What would getting broadband to the countries at the bottom of this list do to their politics?
 - If developing countries skip wired internet completely, what impact will this have?
 - Why are France and Korea so far ahead of everyone else?

Breakdown of traditional education paths

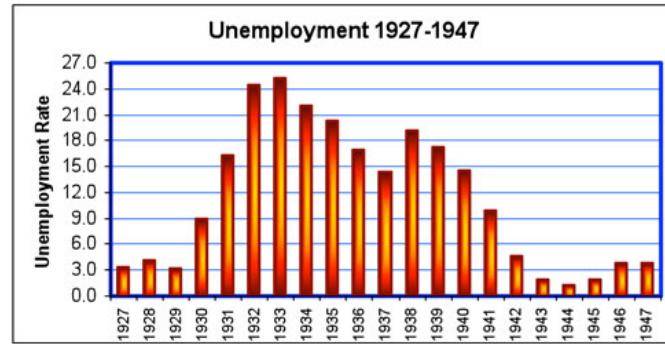
As the pandemic has interrupted schooling⁵⁷ for millions, new relationships to online learning will continue to flourish, in addition to trends like unschooling, which will penetrate new demographics (beyond the fringe). The weight of student debt and continued class conflict will also draw people away from the traditional path of college education.

Consider

- What is the value proposition of universities? Why not just move somewhere extremely cheap and do MOOCs for 3 years?
- Is education about getting smarter, or about conforming, and signalling that conformance?
- As we live longer what is happening to the proportion of our lives we spend in education?
- Why do we generally educate in one block? Is that better than, for example, 2 years a decade?



Economic crash



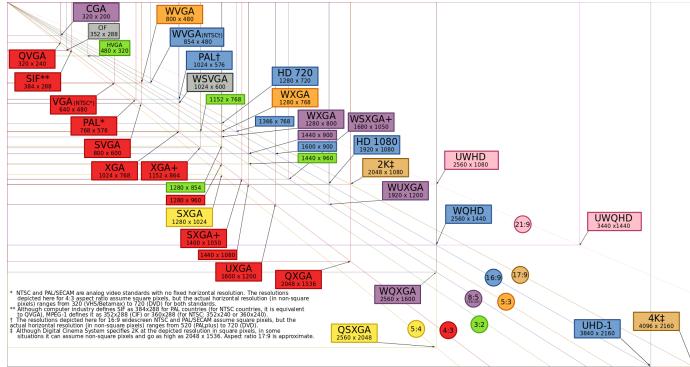
Some event might lead to broad unemployment. In the great depression around 20% of people were unemployed for about 10 years. This was in an age of much lower female labour force participation so the real figure would have been much higher.

If this were to happen today we would be in much more trouble. We are far less able to grow our own food, and to make our own clothes.

Consider

- In the GFC the economy bounced back, but employment levels didn't. Would another recession be the way-in that full robot automation needs?
- Our logistics systems, and homes are much more *just in time*. If you had no money coming in and no other support, how long could you survive on what you already have at home? Then what?

Screens



Screens have become bigger and denser. ‘Retina’ screens mean that we can get up close and not see pixels. “Don’t get too close or you’ll get square eyes” doesn’t apply anymore.

Being able to get close to a screen means that we can change the relationship with them. Touch screens mean that we can interact directly with images.

We’re seeing flexible screens making a tentative step onto the market. Soon we might see screens that feel like they have a texture (buttons, roughness, etc.). We’re also seeing screens in more places: on watches, as car dashboards, as billboards, inside VR headsets.

Consider

- What other interface methods might supplant screens?
- Will screens continue to get bigger and denser?
- What will happen if screens stop being personal and are about shared experiences?
- where else could we have screens?



Cashless biometric payments

Since NFC payments—tap and go—became the norm, it has become increasingly unusual to actually make contact when you pay (i.e. insert or swipe). As this capacity has moved to phones people carry their wallets even less.

You know how iPhone's Face ID can trigger Apple Pay's contactless payments? Now imagine⁵⁸ this technology being available in many retail settings, and in various implementations outside of the Apple ecosystem.

Consider

- If you don't need your wallet to pay now because it's on your phone, then if you don't need anything, will people leave the house without their phones? Or is there too much other value wrapped up in the phone to let it go?
- This will need some very broad scale facial/fingerprint/iris recognition, will society value convenience over privacy again, or will this be the step too far?



Concentration of functions into smart phones

Since smart phones emerged by merging personal digital assistants (PDAs) and telephones, they've been capturing more functions. Now films and documentaries regularly contain smartphone footage. You can pay with your phone, and keep your driving licence, so they've usurped wallets. Most online shopping is done on a phone. They are all round music players and controllers for our smart homes.

Consider

- What else could end up on a phone?
- Is this concentration causing a single point of failure? If your phone goes flat away from home are you totally powerless? (No pun intended)
- Does it even make sense to call it a phone any more?
- What other form factors could it take? What's stopping this?



Architectural team size



Life as an intern, Paris, 1935 (*via Fondation le Corbusier*)

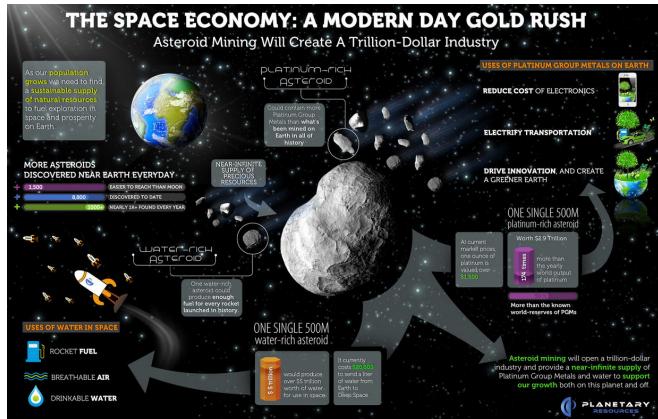
Design Technology has long promised a world of increased productivity. BIM is supposed to decrease the amount of work that design teams do to get given outcome.

However, scope of work is going up; soon teams may need to deliver an *as built* model to the client's facility managers. How do these trends balance?

Consider

- What were Architectural teams like in the past?
- How have Architectural teams of past the coordinated with builder, client and consultants?
- What is the Architectural team now?
- What is the Architectural team size of the future?
- What does the future Design Team look like?
- What are the implications of a Design Team who are all from the same company?
- What happens if there is no design team?
- What if resourcing within the Design Team was a matrix of availability on a weekly/daily/hourly basis? (based on task, skill, expertise, training)

Asteroid mining



Asteroids are mainly made of nickel iron or frozen water. They also contain a lot of platinum group metals. They are easy to mine because they don't have big gravity wells that need to be overcome.

Water is important to space travel because humans need to drink it, but unmanned missions need water too because it can be split into rocket fuel. Launching things

into space is really expensive, so if it's possible to build spacecraft from things already in space it's much cheaper.

The availability of precious metals in asteroids could upset the world economy in the same way that the influx of silver from South America caused massive inflation in the 15th-17th century⁵⁹.

Consider

- If you hollow out an asteroid what could you do with it?
- Platinum is used as a catalyst in chemical reactions. Making it a lot cheaper would make a lot of these applications more viable. What sorts of things could we do if the cost of platinum went down?
- What could you do with a million tonnes of water in space?
- Getting raw materials into space is expensive. What could you use the iron in an asteroid for?



Carbon labelling for consumer goods

Like nutrition facts on food, listing carbon expenditures⁶⁰ related to various products on their packaging or in marketing materials will become a norm. This could be used to justify higher prices⁶¹ for certain more “carbon-responsible” items.

Consider

- Is there space on the packaging? Packaging itself has a CO₂ cost.
- Does the public have the topic-literacy to understand carbon labelling? What other comms would need to accompany this?
- How would it account for varying CO₂ quantities by season and location of end consumer? E.g. a Summer cheese would make less CO₂ because the cows don't need heating and eat grass, but if it was flown from France to Australia it would have a high CO₂ quantity. Where would the labelling be done?



Cost of domestic property



Housing is more expensive (in real terms) than ever. As a proportion of the money that people have to spend, we are spending more of it on housing.

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This might be because there isn't enough supply of housing where people want to live. It might be because housing is a safe asset class.

Low interest rates make it easier for those with wealth to buy more houses, and house values go up much faster than most other asset classes. Are we in a bubble?

If owning stops being attractive, wealth concentration will increase, but maybe a new *safe as x* asset class will emerge for renters to spend their money on.

Consider

- How did we get to the position that we're in now?
- What other explanations could there be for these trends that aren't the obvious ones?
- What would reduce the pressure on the market?
- Is expensive housing desirable?
- Is the current model of how we live going to survive the rise in price?



Zoom fashion

Fashion designers and retailers will create markedly different strategies⁶³ for fashion that appears on the upper body, ie above “the Zoom line” compared with the bottom half of the body, which isn’ usually visible on screen.

Many fashion houses have been embracing comfort and loungewear. Tracksuit bottoms have become the defacto cool weather bottoms of the pandemic.

Consider

- Now that we’ve had a taste of comfort, will we go back?



Centralisation of web companies



Amazon is now bigger than Walmart [Quartz <http://qz.com/462605/amazon-is-now-bigger-than-walmart/>](http://qz.com/462605/amazon-is-now-bigger-than-walmart/)

Amazon is now bigger than Walmart. The internet allows companies to centralise services. This is a long running trend; in 1850 your village would have a singer and someone who played an instrument for entertainment, but with the introduction of music

recording the wealth from entertainment was concentrated into the very best entertainers. The same is happening to education and news providers.

This has also enabled the “long tail”, catering to ever more specific groups of people, but the bulk of everyone’s needs can be fulfilled by Amazon.

With increasing globalisation, more and more services will be provided by a centralised organisation, even if that organisation is coordinating others (e.g. Uber and AirBnB).

Consider

- Companies like Amazon and Ebay provide marketplace services to smaller companies; connecting them to consumers. What are the impacts of this?
- Do we have all our eggs in one basket?
- Do we (consumers) stand to gain from an arms race?
- Politicians talk about “breaking up big tech”. What effect would this have?

Quantum computers



Quantum computers are able to solve a particular type of problem incredibly fast. Unfortunately, that particular type of problem is the one that the world's encryption systems are based on.

Quantum computers are currently a research curiosity, if they become a real world technology then all internet transactions will fail. (Unless credit card companies and banks take action before then to upgrade to quantum encryption.)

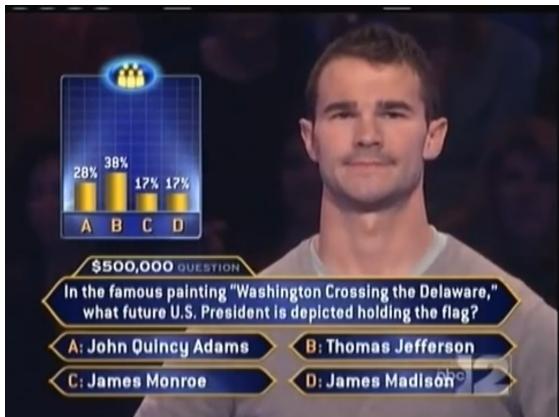
From a more optimistic angle, once computer scientists work out how to phrase their problems in the way that quantum computers like, lots of

very hard problems become quite easy!

Consider

- How much disruption would it cause if electronic money, and other encryption methods, stopped working?
- If protein folding was solved, what would it mean for the pharma industry?

Betting markets



On *Who Wants To Be A Millionaire*, the *Ask the audience* option is almost always accurate. The problem is that if you don't really know, then there's no incentive to keep your mouth shut!

Classical economists like markets because of their information aggregating capacity. People who know something are incentivised to share that information with the world through the market.

Betting markets, or Prediction markets are the same, but for ideas and questions. E.g. there was a question: *Will Greece declare a new national currency in 2015?*⁶⁴ The PredictIt market said that there was only a 14% chance that it would happen; it didn't.

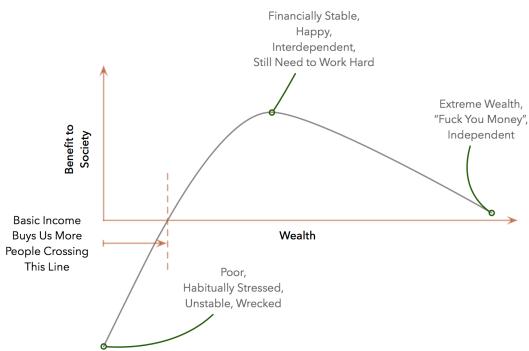
These sorts of markets are generally very accurate, but have had negative press because they can be seen as “betting on terrorism” etc.

Consider

- Will being a knowledge aggregator become a profession?
- Will a track record of accuracy be a mark of social status? A hiring criteria?
- Are there things that are unacceptable to bet on?
- Does this create perverse incentives to manipulate the world to win bets?



Universal basic income (UBI)



Simple graph showing what Universal Basic Income is doing for society [u/canadaduane](https://www.reddit.com/r/BasicIncome/comments/6z728w/simple_graph_showing_what_universal_basic_income/) <https://www.reddit.com/r/BasicIncome/comments/6z728w/simple_graph_showing_what_universal_basic_income/>

UBI is the idea that everyone in a society gets paid a stipend by the state. For example everyone gets \$1000 every month, and any money you make on top of that (after tax) is yours.

There is a lot of discussion about what *universal*, *basic* and *income* actually mean in this context. Is *universal*: everyone inside the state's boundary, all citizens, all citizens over a certain age, all male landowning citizens? Is *basic* enough to not starve, enough to have a living wage?

It's popular across the political spectrum, for different reasons. Small government advocates like it because it'll reduce reliance on the welfare state, big government advocates like it because it's a universal safety net.

Consider

- What would you consider universal to mean? Basic? Income?
- If you need more than the basic amount (e.g. disability allowance) will society look after you?
- Would getting “free money” encourage people to not work?



Psychedelia

Shrooms are the new weed, commercially speaking, as new firms and funds scramble to monetize⁶⁵ psilocybin in advance of its extended clinical

applications. Psychedelics as a class of drugs continue to be destigmatized, relative to other drugs. Forecasts see this reaching a new level of mainstream saturation in coming years.

Consider



Cottagecore and Waldenponding

As our daily activities become more screen based and virtual, there is a movement that embraces tradition. Some see it as a healing way to slow down, others see it as anachronistic LARPing.

Bread baking, clothes making and mending and wood carving are typical cottage core activities.

Waldenponding is an explicit method of cutting one's self off from the social computer of email, Twitter and Instagram etc.⁶⁶

Consider

- Is there an ideal ratio of connected and disconnected? Why not stay connected all the time?
66
- Many people are quite performative in their cottagecore/waldenponding, posting their bread to Instagram, or announcing that they're taking a digital detox. Is this a good thing, or a symptom of the problem?
- Will there be something coming that replaces these trends? Another, higher/lower tech wellness trend?



Virtual reality



Current virtual reality gives us a glimpse of how we'll experience it in the future. There's a lot between us and fully believable, totally immersive virtual environments. As we solve more and more of

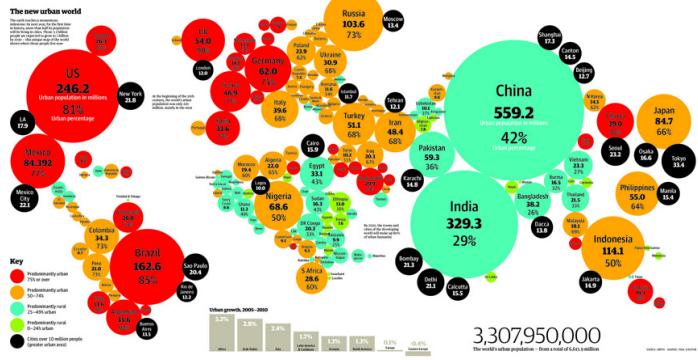
those problems, VR will become more useful. Breaking out of gaming to be the standard method for video conferences, for virtual site tours and for shopping.

Consider

- If VR was perfect, would people still prefer the “authentic experience”⁶⁷
- Do crimes committed in VR have moral status? Killing? Rape? ⁶⁸
- What could VR never simulate? Are you sure?
- Is VR just a step on the road to AR, or do they have different applications?



Urbanisation



Populations and urbanisation percentages by *Hannah Ritchie and Max Roser, Our World in Data* <<https://ourworldindata.org/urbanization>>

The NSW Department of Infrastructure Planning and Natural Resources estimates that 60% of the world's population will be living within cities by the year 2030 and about 91.1% of the Australian population will live in cities. They expected the population in the Sydney Region alone to grow by a net increase of 40,500 per year.

The forecast demand for new residential development to support Sydney's current population is 25,000 dwellings per year over the next ten years, with 25% of that growth located in Greenfield sites on the urban periphery and Greater Metropolitan Region corridors.

With the enlarging population and increasing urbanisation the demands on resources will contribute to further degradation of the Australian environment and Sydney's ever expanding urban sprawl.

Consider

- Is it inevitable that the urbanisation trend will continue?
- Can we bring traditionally rural activities into cities too?
- What benefits could come from even greater urban density?
- What mistakes are cities making right now that we might not make in the future?

TikTok/K-pop activism



Wikipedia <https://commons.wikimedia.org/wiki/File:Korea_KPOP_World_Festival_2018_01_13.jpg>

Apps and subcultures that consist of almost entirely young people are able to self-organise and do things that seem surprising and impossible to the older population that aren't involved. E.g. the overbooking of a Trump rally by K-pop fans.

The capacity for a group of under-enfranchised people to self-organise like this is new, and its power is not well understood.

Consider

- This is inherently global, the Arab Spring was similar, but had local effects, where could this go next?
- Is this just Gen Z using TikTok? Might we see a coup led by the Peppa Pig fan chat brigade?

Full-filter reality

Consider

Immersive, photo realistic imagery in the form of Instagram-style filter layers will become widespread beyond just phones when applied via increasingly mature augmented reality systems⁶⁹, forcing people to question the relationship between the visual and the real, and potentially fragmenting consensus reality even further.



Bee population crash



Bee populations are declining.

In recent winters, in Europe alone, bee losses up to 53% became a reality.

Plants rely on insects like bees to reproduce. Plant reproduction is vital for our food supply. If the bees die, then we die too!

This dramatic decline in bee populations is the result of multiple factors such as diseases and parasites, climate change and wider industrial agricultural practices.

Consider

- What would we need to do to support bee populations?
- Could we come up with a technology solution to replace bees? What would the risks be?



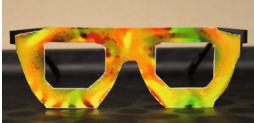
Facial recognition



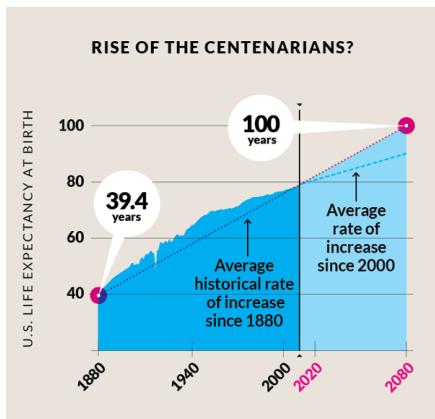
Computers can now recognise faces almost as well as humans can. They are more susceptible to tricks like face paint or sunglasses than we are, but that's probably not going to take long to solve.

Strong facial recognition will mean that security agencies can track you wherever you appear on a CCTV feed. It means that advertisers can personalise billboards to your particular buying habits.

Consider

- How might these ideas of surveillance influence other systems to become more intuitive?
- Will fashion embrace it or resist facial recognition⁷⁰?
- What, other than faces, can be “recognised”?
- Will the bans on facial recognition get more severe, or will they be lifted? Is there a middle ground?

life expectancy



Life expectancy continues to increase⁷¹ in contrast to Hobbes' idea of life, which was "Nasty brutish and short". We are comfortably on track to hit an average life expectancy of 100. There is a lot of variation in global life expectancy. That average of 100 means that there will be a global reduction in lifespan inequality, or that some nations will see huge lifespan increases. It's not uncommon to see claims that some children alive today will live to be 150⁷² or 200⁷³!

Life expectancy is measured at different ages. These days, in 'developed' countries the difference between life expectancy at birth and at five years isn't substantially different. Some believe that prehistoric humans could expect to live into their mid fifties⁷⁴ if they made it through childhood.

Consider

- Will life expectancy rise equally all over the world?
- Will people work for longer in their life?
- Will people maintain a single career? Does their degree from 1990 have any validity in 2050[⁸]?
- Will there be a modern equivalent to coopers and farriers needing to find new careers during their lifetimes?

Non-sovereign currencies



Money developed as a special case of any unit of exchange. That could be sheep, cows and camels, or silver and gold. At some point someone made an object that stood in for the direct value of those objects and that became the money that we recognise today. 75

Most money these days is backed by a national bank. Non-sovereign currency means that it isn't backed that way by a government. This could be Linden Dollars⁷⁶ that are spent inside the game Second Life, but the first

thing that most people think of is Bitcoin. Bitcoin is the most famous of a whole class of cryptocurrencies. Cryptocurrencies are 'mined' through cryptographic algorithms that control the production rate of the 'coins'.

If currency is decoupled from national borders and from governments it takes away one of the most powerful levers that governments have to affect their country. It results in a much 'purer' expression of market forces. The positive or negative effects of this are unknown.

Consider

- If nations don't control money, how will they generate trust?
- What will it mean for taxation?
- What does this mean for markets?
- What will it mean for crime? Black and grey economies often operate on a cash only basis⁷⁷.
- How will we manage the volatility?



Climate migration

Climate crises will increasingly force huge populations⁷⁸ to relocate, causing strain over resource allocation, border issues, culture⁷⁹ and the overall safety of millions.

Climate change in the past caused the collapse and migration of the Greenland colony, and was one of the reasons that the Germanic tribes moved on Rome, contributing to its collapse. In other words, this is not a new problem, and it's happened a lot before.

The modern world has much more structured mechanisms for dealing with refugees, but was overwhelmed by a relatively small crisis in Syria. If all

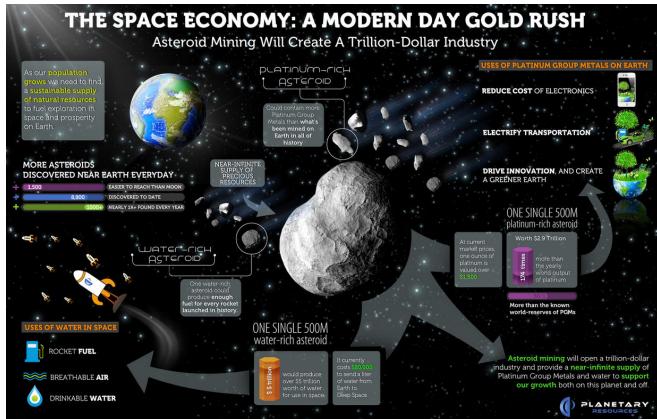
the pacific islands become uninhabitable, or North Africa gets too hot, there will be a movement on a scale that will overwhelm the current system.

Consider

- How do we define crisis? Are people moving because “the weather is better here” or because there’s a genuine need to get away from their origin?
- If the climate is causing migration, people will be moving from uninhabitable to almost-uninhabitable areas. Will this trigger a cascade failure?
- Can we get around this with technology? Texas’s cold weather infrastructure totally failed in February 2021, what would happen if there was a major power cut in Dubai?



Private space exploration and asteroid mining



Asteroids are mainly made of nickel iron or frozen water. They also contain a lot of platinum group metals. They are easy to mine because they don't have big gravity wells that need to be overcome.

Water is important to space travel because humans need to drink it, but unmanned missions need water too because it can be split into rocket fuel. Launching things

into space is really expensive, so if it's possible to build spacecraft from things already in space it's much cheaper.

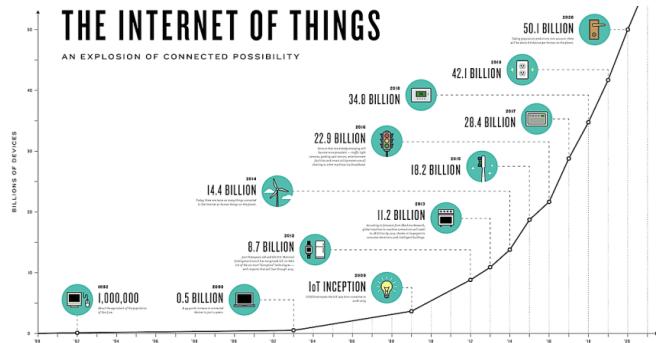
The availability of precious metals in asteroids could upset the world economy in the same way that the influx of silver from South America caused massive inflation in the 15th-17th century⁸⁰.

Consider

- If you hollow out an asteroid what could you do with it?
- Platinum is used as a catalyst in chemical reactions. Making it a lot cheaper would make a lot of these applications more viable. What sorts of things could we do if the cost of platinum went down?
- What could you do with a million tonnes of water in space?
- Getting raw materials into space is expensive. What could you use the iron in an asteroid for?



Smart homes & internet of things



This is an image of an xxx by YYY <<http://idisrupted.com/disrupted-electronics-internet-things-may-create-moores-law-steroids/>>

Legislation is already in place that all white goods will have wireless communication built in. That means that a central controller in your house will be able to tell your air conditioning to ease off a couple of degrees to reduce peak electricity loading.

The dream of smart refrigerators ordering more milk as you run out is getting closer. There are lots of other issues that are less obvious and less friendly about every aspect of your life being instrumented. E.g. there have been lots of examples of smart home devices being hacked and used as spy cameras. Less frightening, but still annoying, a lot of smart devices stop working altogether if the parent company shuts down.

Consider

- Would you let a power company decide when you boil the kettle if it saved you money?
- Who would have access to data about your house? Who should?
- Would you like to be able to turn off your iron if you left it on at home? How about your lights?
- What if your smart lock company goes broke and you can't get into your house?
- How does this impact the built environment?

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