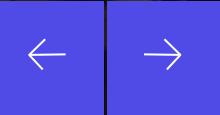


AI Industry Adoption Approaches

LECTURE 2



ARTIFICIAL INTELLIGENCE PRACTITIONERS COURSE



< JOURNEY >

AI Landscape – Lecture 1



AI Industry Adoption Approaches – Lecture 2



→ Lab 1 – Setting up your Cloud Account

NLP and Virtual Assistants – Lecture 3



→ Lab 2 – Gain Insights from AirBnB reviews

Computer Vision – Lecture 4



→ Lab 3 – Creating an AI Virtual Assistant

Machine Learning and Deep Learning – Lecture 5



→ Lab 4 – Training AI to Host Customers

Future Trends for AI – Lecture 6



→ Lab 5 – Building your own Translator with AI

→ Lab 6 – Analyze, Classify, & Detect Objects

→ Lab 7 – Classifying Images Using Node-RED

→ Lab 8 – Fraud Prediction using AutoAI

LECTURE 2

AI INDUSTRY ADOPTION APPROACHES

OBJECTIVES

- Understand the effect of the global industry adoption of Artificial Intelligence
- Explore the existing trends for Autonomous Vehicles
- Explore the adoption strategies for Smart Robotics
- Understand the impact of AI in the future workforce



► 1. AI Industry Impact

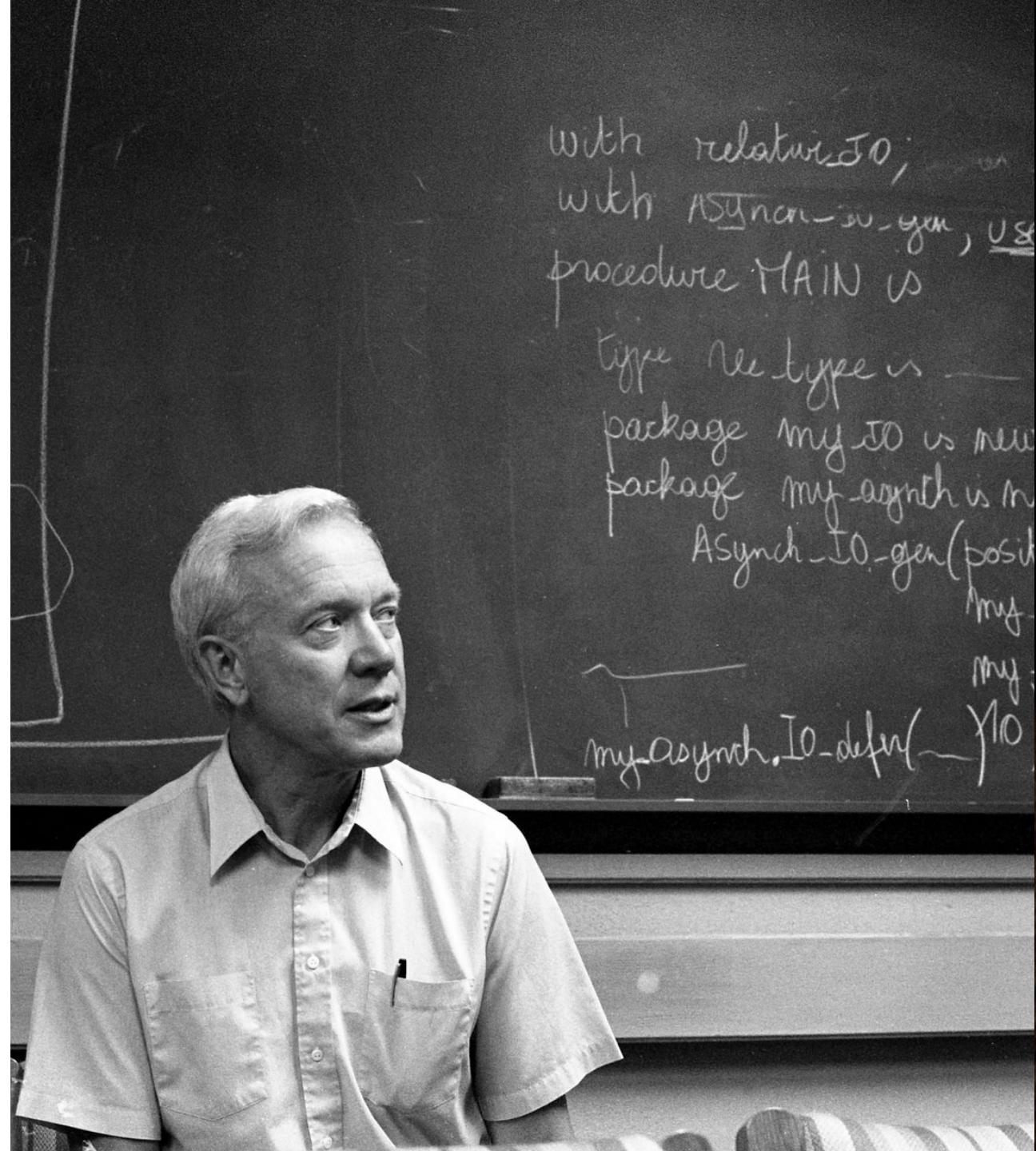
2. Autonomous Vehicles
3. Smart Robotics
4. Future Workforce and AI
5. Summary & Resources



“In the future AI will be diffused into every aspect of the economy”

Nils J. Nilsson

Founding researcher, Artificial Intelligence & Computer Science, Stanford University



Mainstream press confirms AI as a key part of the disruptive forces in business today

Why artificial intelligence is enjoying a renaissance - *Economist*¹

How Cognitive Systems Could Redefine The Way Governments Work - *Forbes*²

Artificial-Intelligence Experts Are in High Demand

- *The Wall Street Journal*³

Artificial Intelligence Swarms Silicon Valley on Wings and Wheels

- *The New York Times*⁴

March of the machines

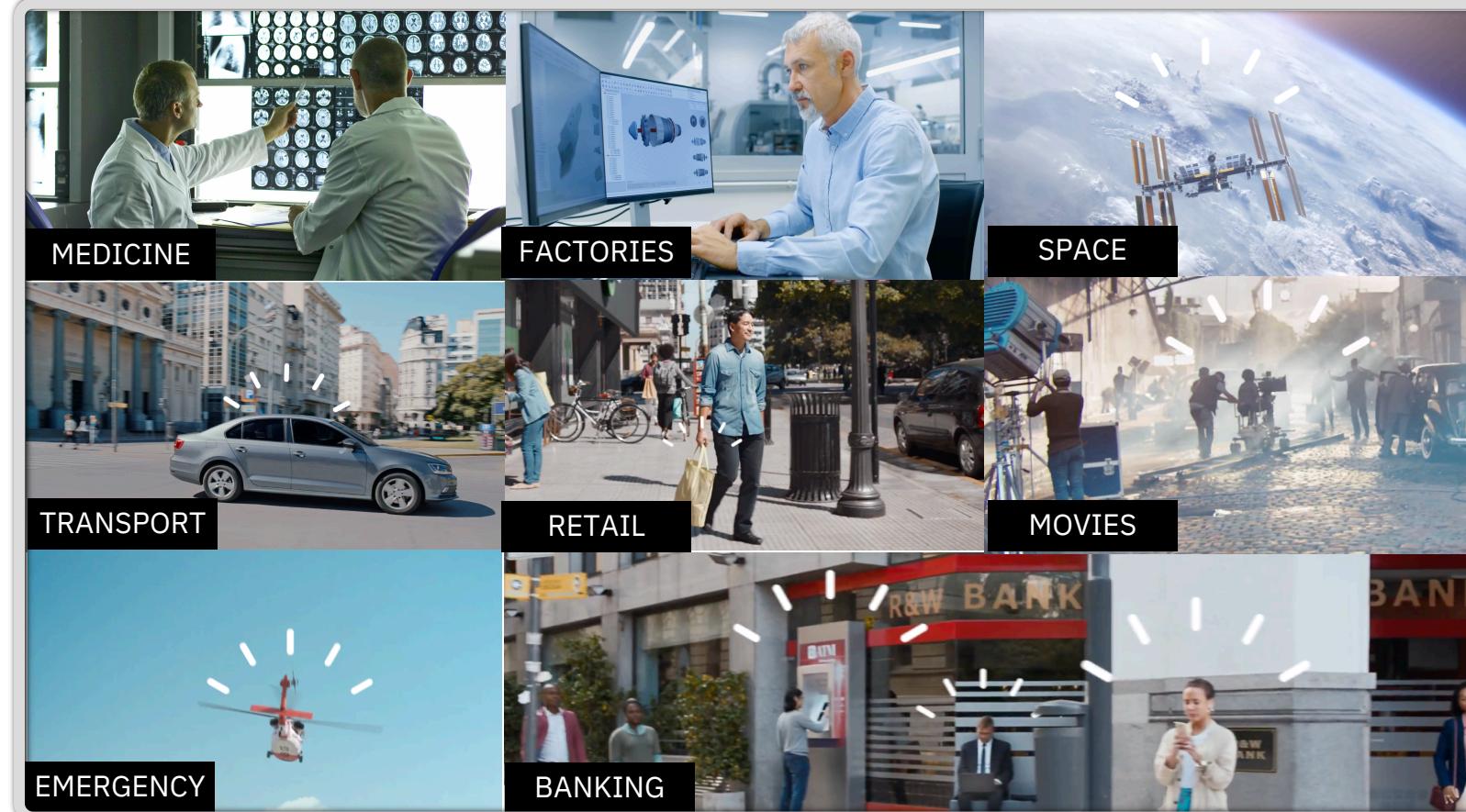
What history tells us about the future of artificial intelligence—and how society should respond - *Economist*⁵

We have to upgrade our skills to match intelligent machines - *Business Insider*⁶

We are now at the brink of the 4th Industrial Revolution.

AI is one of the biggest facets of this revolution

It will affect almost all sectors, as did previous Industrial Revolutions



Common areas where AI provides business value

Engagement Reimagined



AI Engagement & Personalization

Personalized healthcare, finance and learning, Micro-segmentation, Targeted marketing, Augmented reality, Global trade logistics, Blockchain for payments, Robotics

Deeper Insights



AI Insights & Knowledge

Data-centric systems, Distributed Deep learning, Neuromorphic systems, Quantum computing, Homomorphic encryption, Machine foresight, Cognitive discovery

Agility and operational efficiency



AI Automation & Optimization

Robotic process automation, NLP, rule-based decision making, Cognitive Agents, Real-time tracking of handoffs between systems and people (smart workflows)

AI Engagement

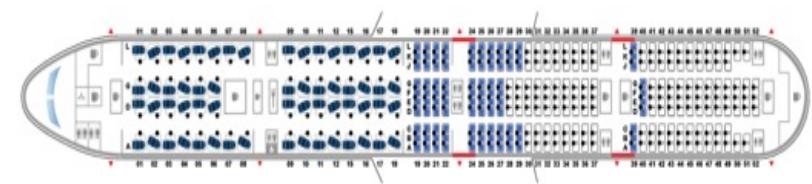
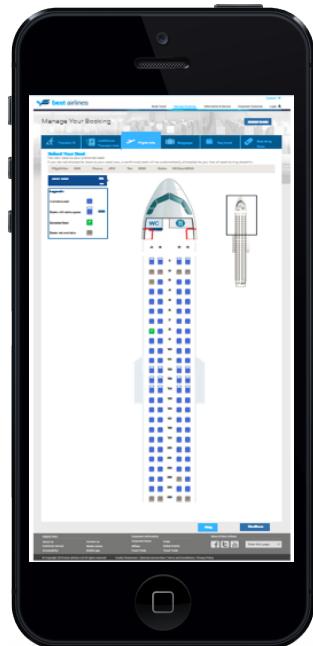
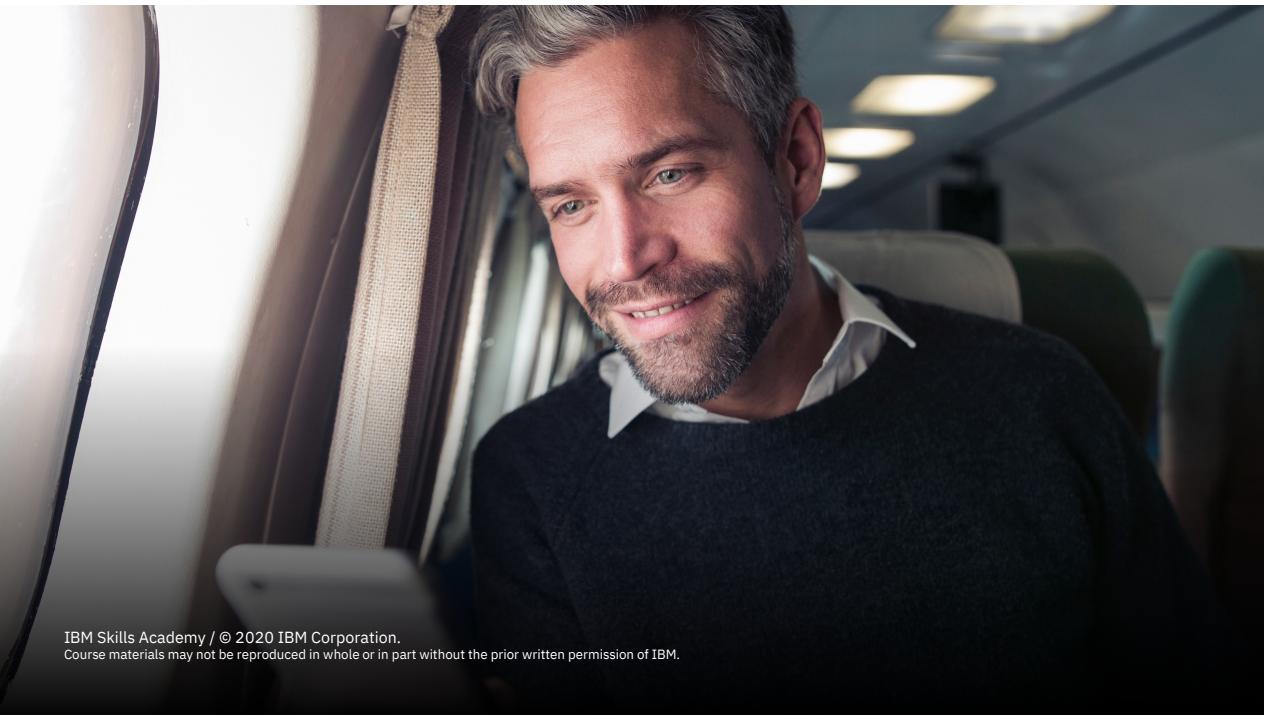


Personalized pricing using Deep Learning algorithms

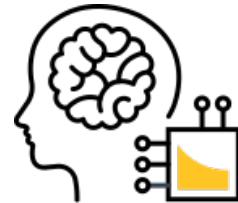
Set prices on what the software believes passengers will be willing to pay.

What is the best personalized offer out of 460,800,000 possibilities?

AI algorithms that understand travel context, apply past learning to select optimal offers, and constantly learn from offers and previous orders.



AI Insights & Knowledge



Radiology powered by AI

Aims to provide crucial perspective that can be time-consuming to find in the EMR by presenting clinical context from a variety of data sources in seconds

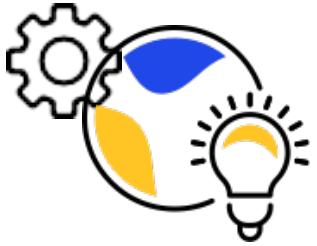


Expanding the physician's view with AI

So they have greater confidence in their diagnostic and treatment decisions for their patients

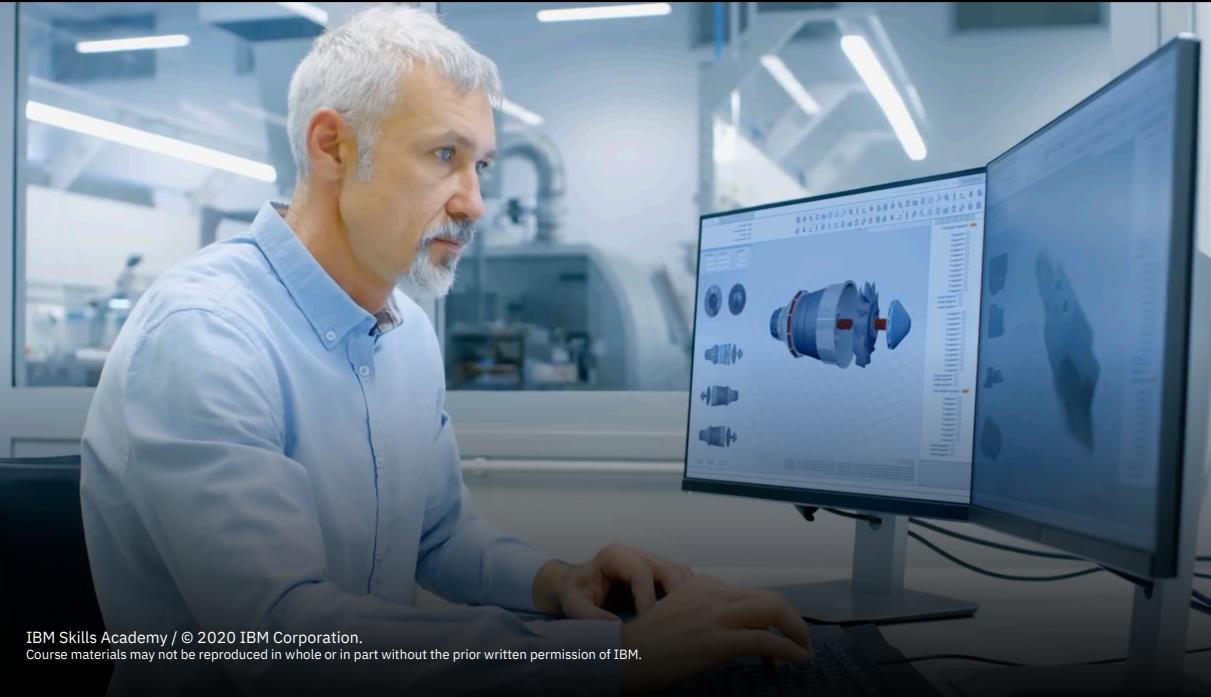


AI Automation



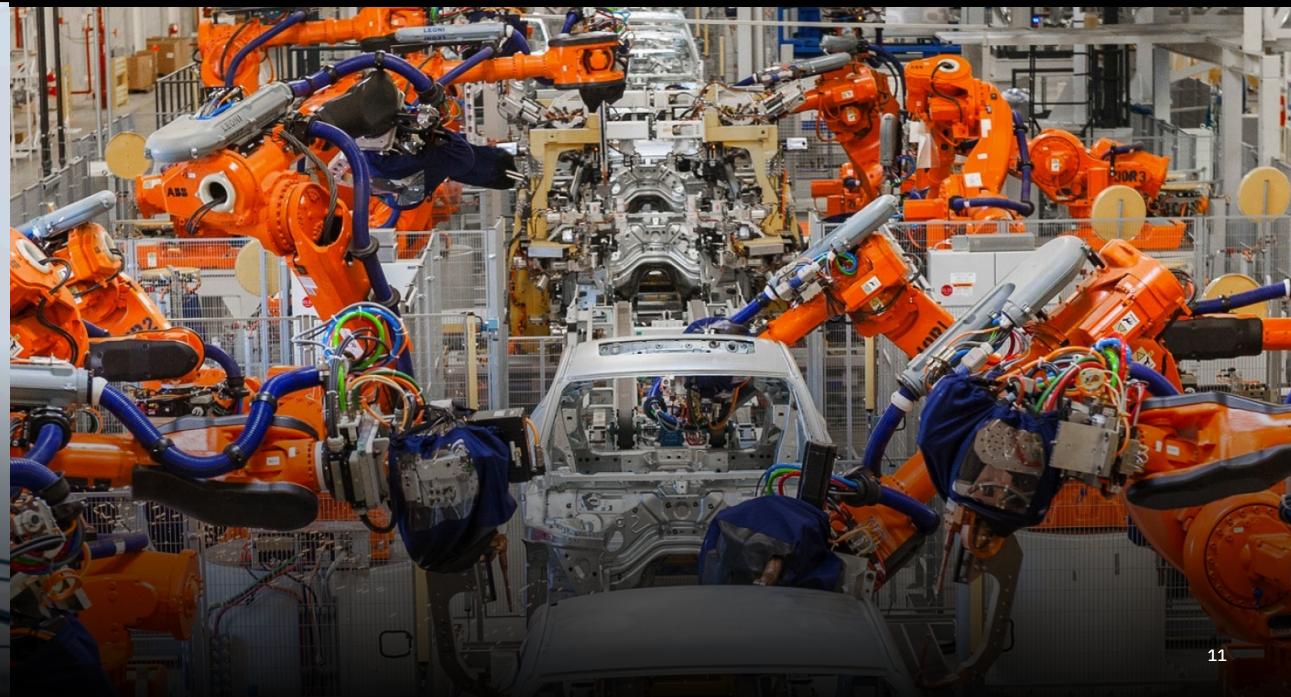
Engine anomaly detection using a neural network

Anomalous sensor readings are highly predictive of pending engine failures.



Welding robots predictive failure detection and maintenance assessment

Supervised learning techniques provide early failure warning based on system messages and sensor readings that streaming from the production line



Bringing it all together

AI can tackle city-wide issues

- Installing new real-time traffic speed detectors
- Identifying bottlenecks and continuously tweaking the signal timing, making each intersection efficient and increasing the number of cars throughput



Managing traffic in a major metropolitan area is a key challenge that can be addressed with AI involving:

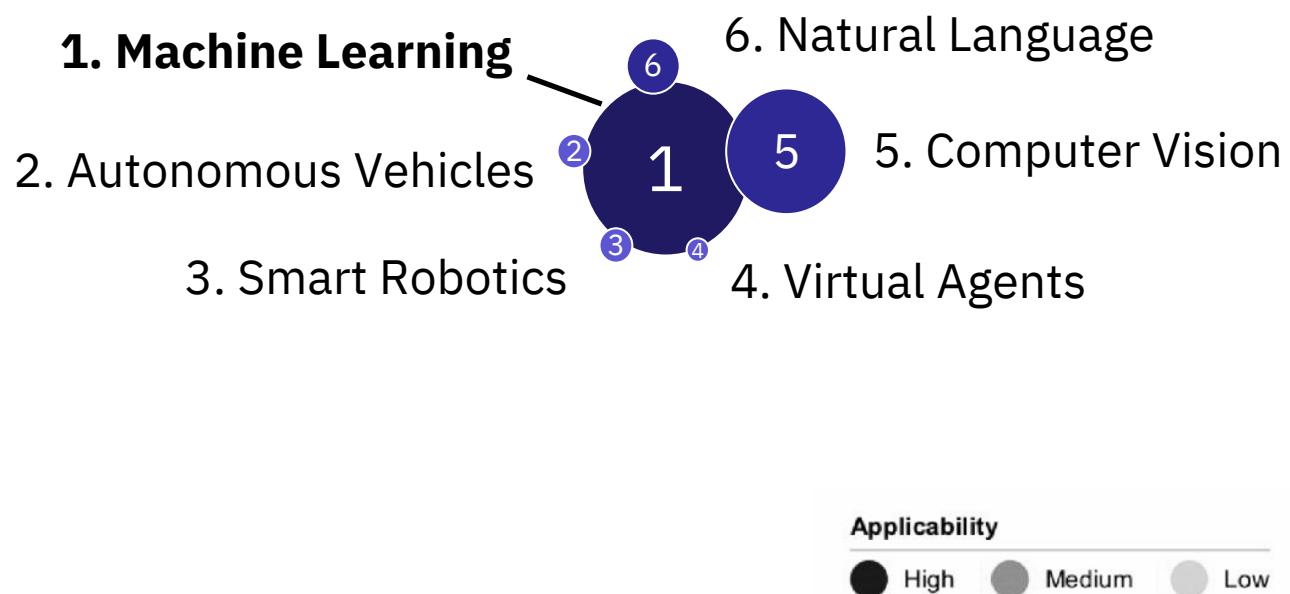
ENGAGEMENT | INSIGHTS | AUTOMATION



Source: Forbes and IBM – Intelligent Automation

Six key AI technologies across the value chain

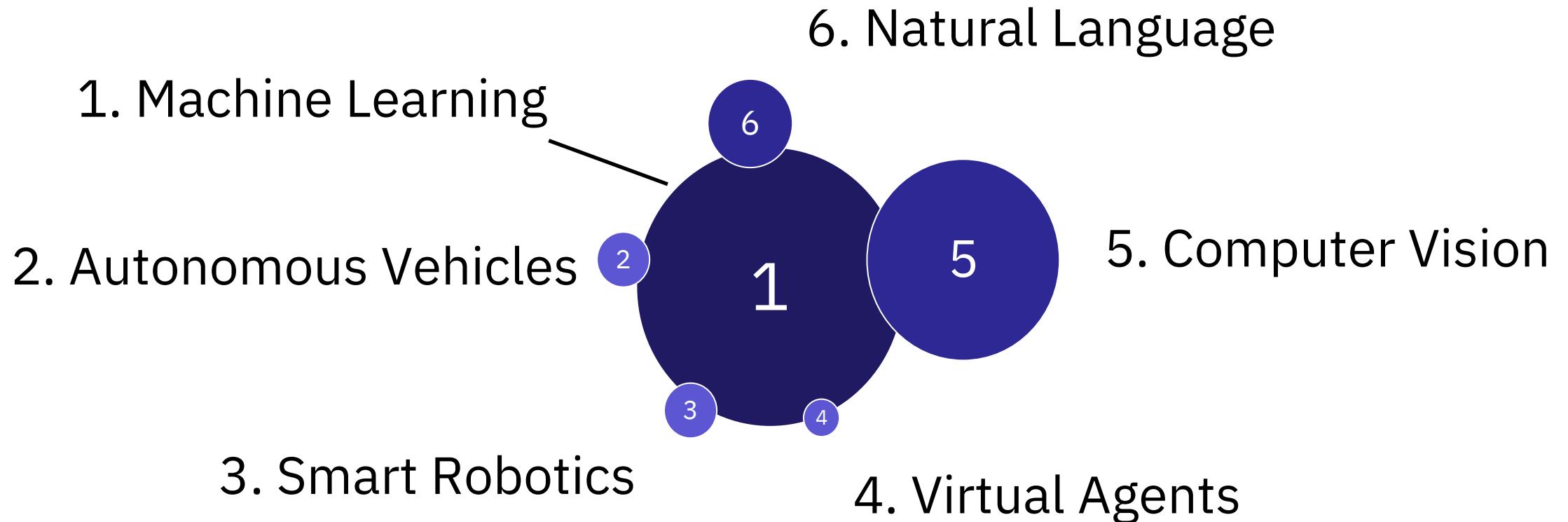
From Retail to Education, these 6 AI technology areas play an important role in reinventing industries and transforming our world



	Project	Produce	Promote	Provide
Applicable technologies	Enlightened R&D, real-time forecasting, and smart sourcing	Operations with higher productivity, lower cost, and better efficiency	Products and services at the right price, with the right message, and to the right targets	Enriched, tailored, and convenient user experience
Retail		Anticipate demand trends, while optimizing and automating supplier negotiation and contracting	Automate warehouse and store operations; optimize merchandising, product assortment, and microspace	Optimize pricing, personalize promotions, and tailor website displays in real time
Electric utilities		Enhance demand and supply prediction, assess reliability of integrated generation assets, and automate demand-side response	Optimize preventive maintenance, improve electricity production yield, reduce energy waste, and prevent electricity theft	Optimize pricing with time-of-day and dynamic tariffing; match producers and consumers in real time
Manufacturing		Improve product design yield and efficiency, automate supplier assessment, and anticipate parts requirements	Improve processes by the task, automate assembly lines, reduce errors, limit product rework, and reduce material delivery time	Predict sales of maintenance services, optimize pricing, and refine sales-leads prioritization
Health care		Predict disease, identify high-risk patient groups, and launch prevention therapies	Automate and optimize hospital operations; automate diagnostic tests and make them faster and more accurate	Predict cost more accurately, focus on patients' risk reduction
Education		Anticipate job market demand, identify new drivers of performance to assess students, and help graduates highlight their strengths	Automate teachers' routine tasks, identify early disengagement signs, and optimize group formation for learning objectives	Personalize learning, shift from stop-and-test model to continuous learning cadenced by virtual coaches and tutors, and build student self-awareness

Source: McKinsey – Global Institute Analysis

Lets understand in detail these technologies



1. AI Industry Impact

► 2. Autonomous Vehicles

3. Smart Robotics

4. Future Workforce and AI

5. Summary & Resources



Driverless Cars

Video 6:57 minutes



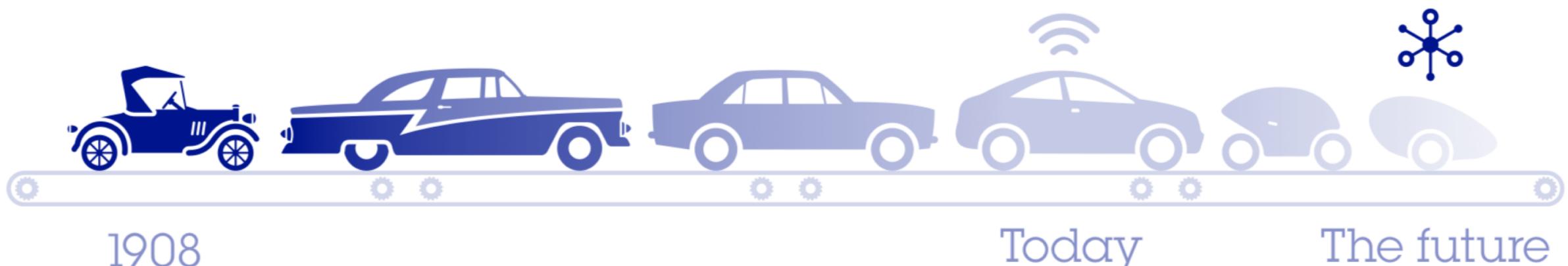
The Autonomous Car

Driverless or fully autonomous vehicles – has increasingly looked within reach

Cars will ultimately communicate, socialize and collaborate with other things, including other vehicles, traffic lights, parking bays and retailers

“The auto industry is poised for more change in the next five to ten years than it’s seen in the past 50.”

—Mary Barra, CEO, General Motors ¹

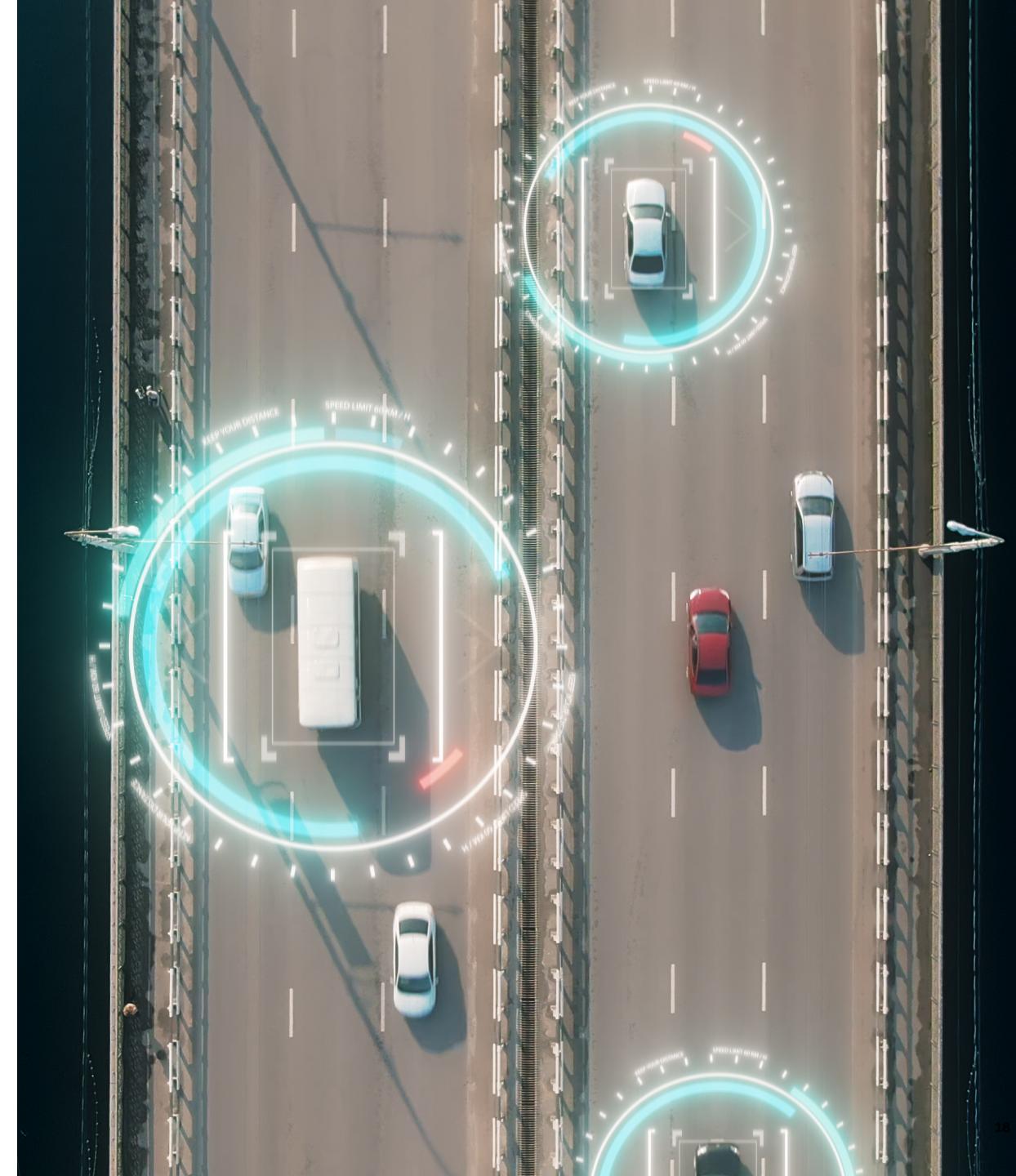


Connected Car Today

Holds **1 million lines** of software **code** and produces up to **25GB of data** every hour

Connected with:

- Manufacturer to share alerts and performance logs
- Internet to provide a unique passenger experience



AI technologies will address top concerns from consumers

Vehicle Safety



An estimated 1.25 million deaths worldwide in the year 2015. That is one person killed every 25 seconds.

Security/Data Privacy

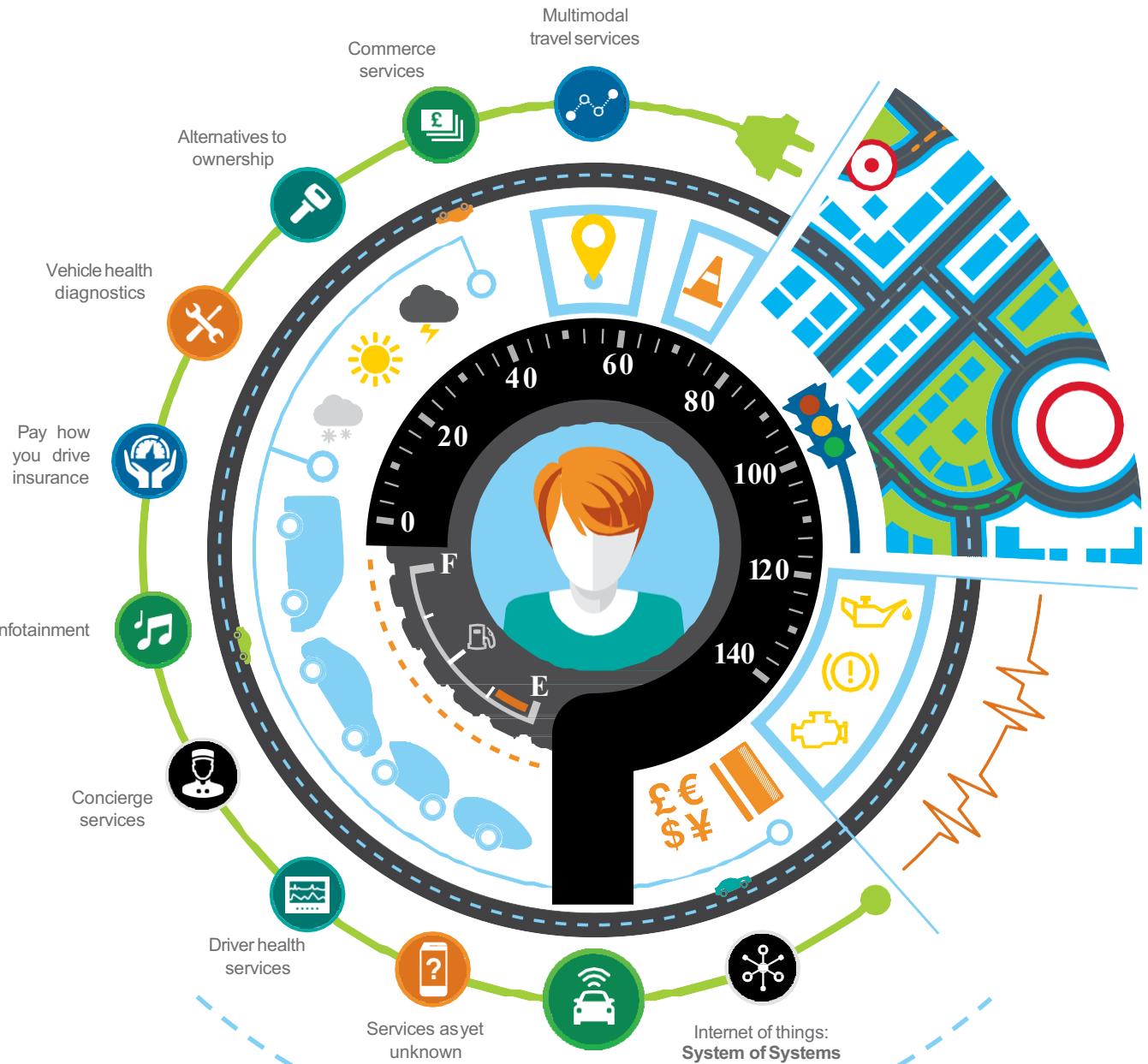


Cars today have up to 100 ECUs and more than 100 million lines of code — a massive attack surface.

Disrupting the Auto Industry

Array of new digital services created out of the vast amounts of data this connectivity will unleash

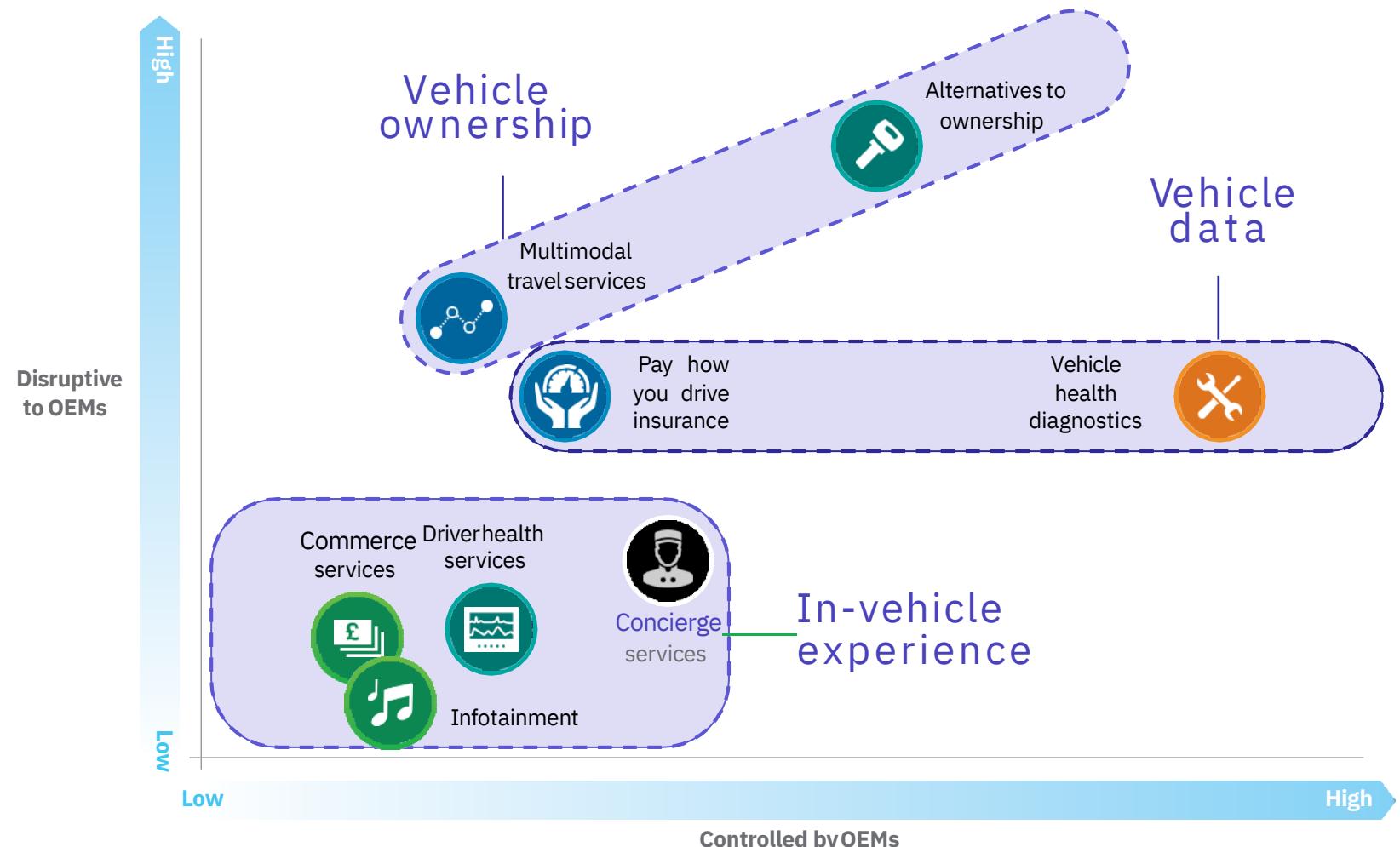
Reinvent business models, change the auto ecosystem and redesign customer engagement and expectations.



Future control points and value for connected cars

Connected car focus areas:

1. In-Vehicle Experience
2. Vehicle Data
3. Vehicle Ownership



Audi uses Machine Learning in their manufacture plants



Audi uses robots to independently transport cars from production to shipping positions.

Data is collected from sensors to determine position and dimensions of the car and then adjusts to it. Machine learning optimizes the movement of the cars and optimal space usage



LECTURE 2

AI Industry Adoption

1. AI Industry Impact
2. Autonomous Vehicles
- 3. Smart Robotics**
4. Future Workforce and AI
5. Summary & Resources



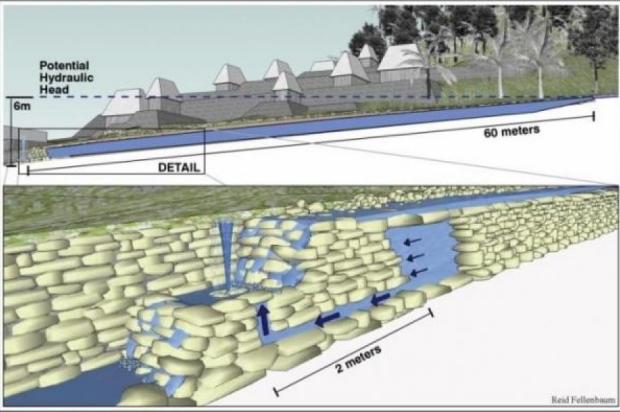
AI & Robots

Video 2:20 minutes



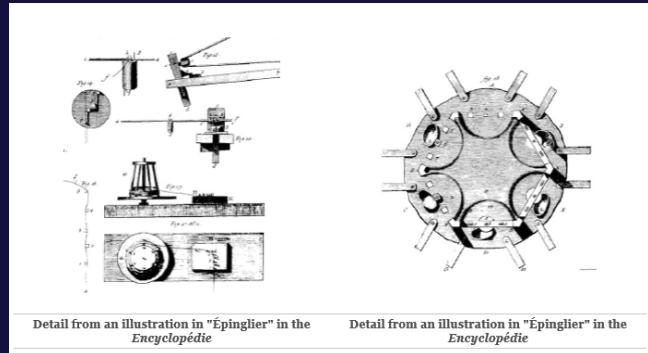
Automation of human tasks has a long history

Mayan aqueducts for water transportation



www.sciencedaily.com

Adam Smith's nod to the hat pin maker dilemma



www.oll.libertyfund.org

Henry Ford's automation of the assembly line



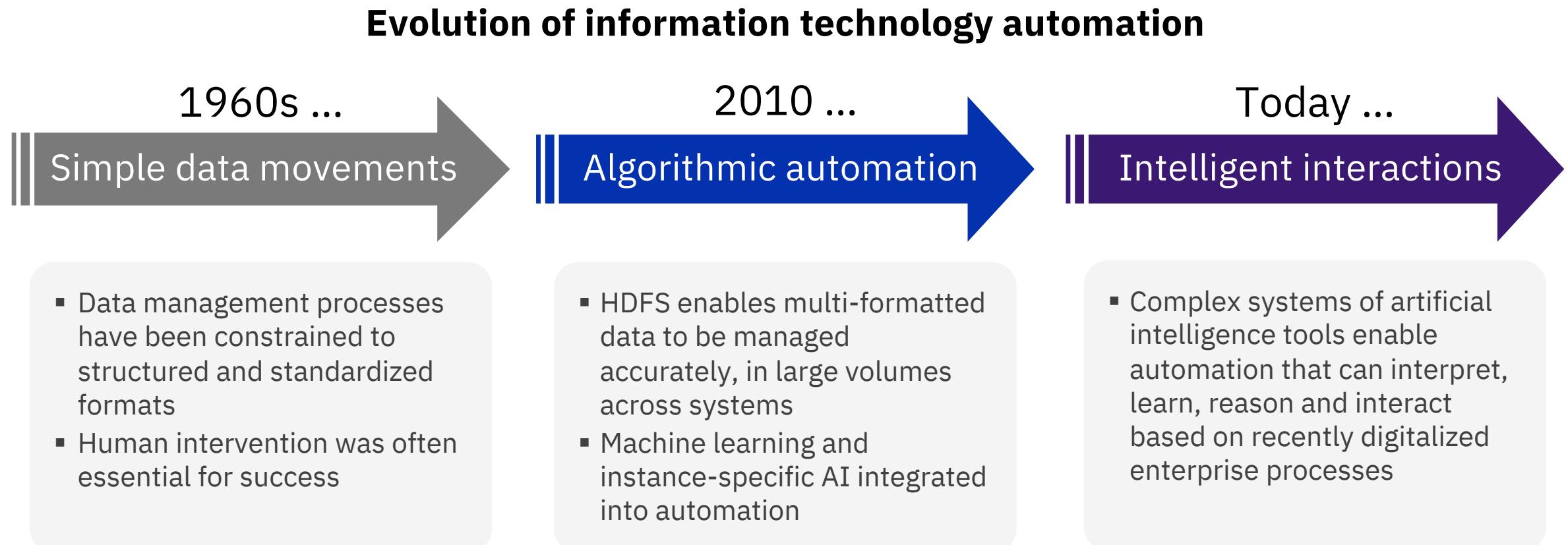
www.history.com

The Information age

Automation of data-driven enterprise tasks started in the 1960s with the introduction of enterprise resource planning systems and now has evolved to include **robotic process automation** (hence, the term “bots”).



The advent of complex data processing and artificial intelligence (AI) is driving automation's evolution



Early adopters, like UBS Group, see the intersection of tech, data and AI as an opportunity

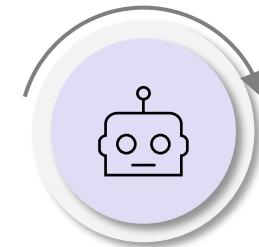


<https://www.ubs.com/magazines/innovation/en/into-the-future/2017/ai-and-financial-services.html>

“The availability of unprecedented amounts of data (much of it unstructured), the exponential increase in computer processing power, the declining price and growing convenience of data storage solutions, and recent advances in machine learning algorithms, all provide a powerful toolset for making significant strides in **intelligent automation.**”

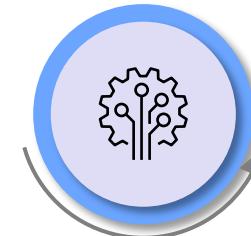
Field of dreams: AI and financial services
UBS Group Innovation

Automation Process Levels



Basic process automation

- The “robot” is taught to drive applications like a human
- Performs prescribed actions



Advanced process automation

- The “robot” follows predetermined pathways, conducts complex calculations, performs actions, etc.
- Uses AI to complete specific tasks
- Accesses a base knowledge repository into process flows



Intelligent process automation

- The “robot” reasons and learns through data discovery
- Interacts with humans through a combination of AI
- Records every action which makes it auditable and accountable

No level of automation

% total respondents

52%

27%

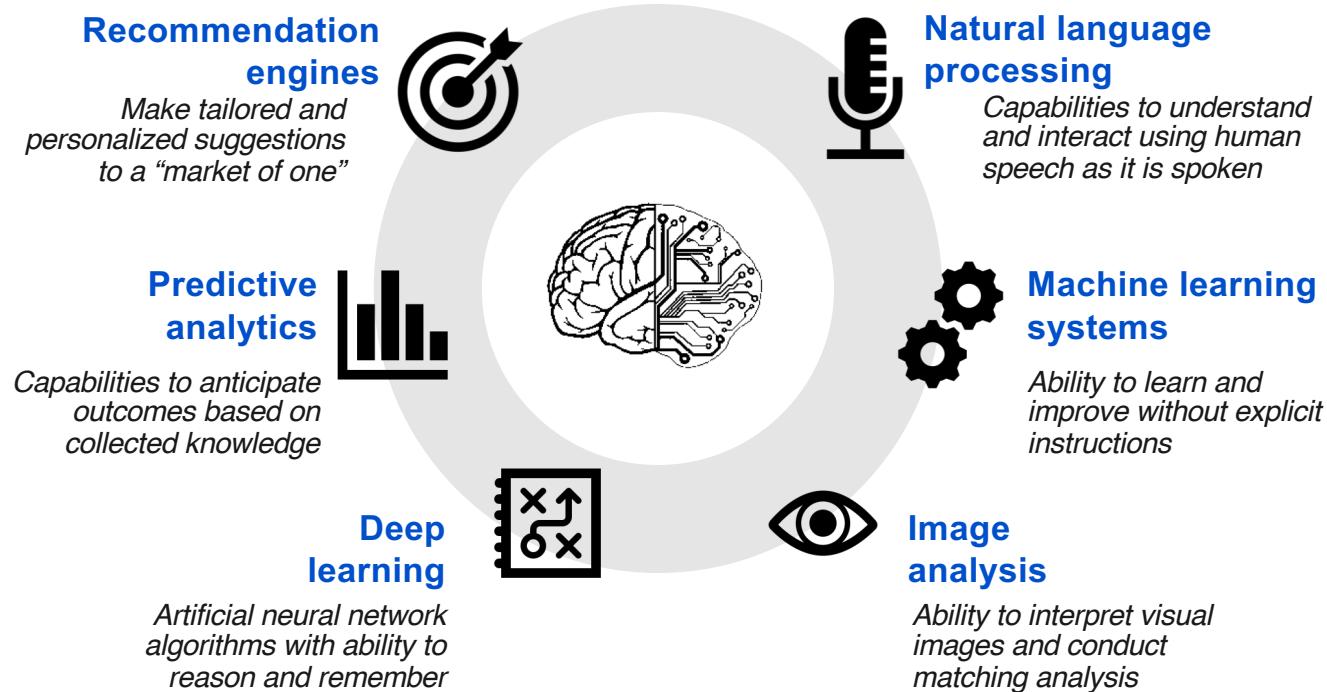
12%

9%

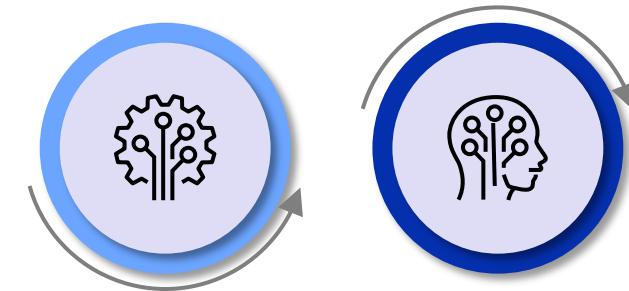
n = 2,985

AI technologies underpinning automation are readily available

Technologies affiliated with AI for the simulation of human intelligence processing



Advanced automation users *may* and Intelligent users *do* use AI technologies



LECTURE 2

AI Industry Adoption Approaches

1. AI Industry Impact
2. Autonomous Vehicles
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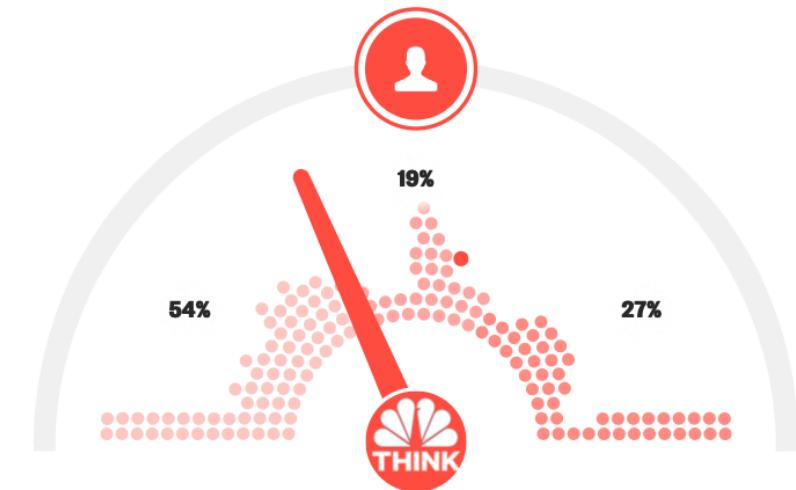
ARTIFICIAL INTELLIGENCE In the Job Market

“half of the American workforce is at risk of being replaced by robots in the next decade”

Source: The Washington Post

Will robots take your job?

Humans ignore the coming AI revolution at their peril.



Yes, they are easy to manipulate and unregulated.

No, the threat is overblown but the potential is real.

Source: <https://www.nbcnews.com/think/opinion/will-robots-take-your-job-humans-ignore-coming-ai-revolution-ncna845366>

AI Impact on Future Jobs

Video 8:17 minutes



Discovery
CHANNEL

Technology
It's impossible to say exactly what the future holds, but we can make some educated guesses.

Robots will

Once confined to the pages of science fiction, robots promises to be the most profound part of the automated revolution. While some experts including the automotive and aerospace industries now predict that a tipping point is near, others believe that much of the developed world will have to undergo a transition.

Many of us recognize robots as the future of work, however, in a classic example of optimism vs. pessimism, two-thirds of Americans believe they will never be replaced by robots. Some believe that robots will take over their current jobs, while others believe that robots will never replace them.

Somehow, we believe that the commercial sector will survive the transition.

For example, the future of the food industry is

Workforce transformation is the key to successful AI technology adoption

ACCEPTANCE, SKILLS, AND RESOURCES ARE THE BIGGEST HURDLES TO AI ADOPTION

Greatest challenge to your organization's use of AI⁸

Lack of skills and resources to execute effectively

43%

Difficulty aligning strategy and execution plans

35%

Incorporating advanced analytics and AI into workflows

29%

Lack of trust in automated decisions

24%

New categories of risk tied to machine responsibility

24%

Securing our IoT platform and devices

22%

Immature technology

20%

Employee resistance

19%



60%

Optimizing business processes for automation



28%

Changing risk model

WORKFORCE TRANSFORMATION



47%

Training humans to work with machines



27%

Changing employee behaviors toward machines



31%

Incorporating machines that adapt and learn to make recommendations

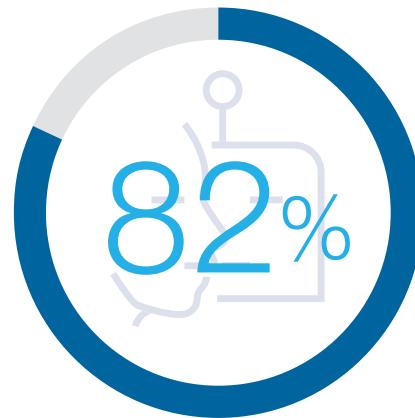


18%

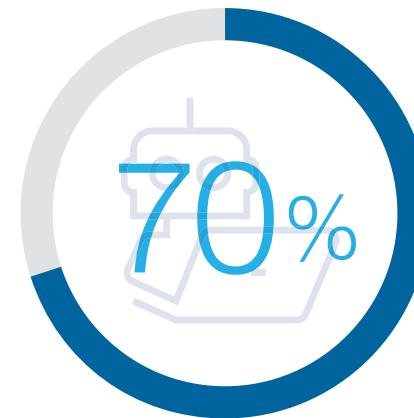
Increasing use of natural language processing²

Teaching humans to work with machines begins with “feeling” comfortable

Teaching humans to work with machines begins with “feeling” comfortable



Employees need training and encouragement to feel comfortable working with intelligent machines



Intelligent machines will lead to higher-value work for our employees



Intelligent machines will have a meaningful impact on job descriptions and activities in the next three years

Best practices to successfully implement AI within an organization

Let's discuss what you need to do before implementing AI

Here are a few steps you need to take:

1. Develop an AI strategy and roadmap
2. Establish AI capabilities and skills
3. Start small and scale quickly

Develop an AI strategy and roadmap

Steps:

1. First, it's important to understand AI and to research what it can and can't do for your organization
2. Once AI is understood, the next question you should ask yourself is: "What specific problem do I want to solve, or what opportunity do I want to take?"
3. Prioritize the use cases into a transformation roadmap that covers both a long-term vision as well as concrete feasible quick wins.
4. Think about what data you have available.

Establish AI capabilities and skills

AI requires a completely new set of capabilities and skills which may be in short supply in an organization

Assigning a dedicated team is important, but you also need to assure the right mindset and way of working in the rest of the organization.

Start small and scale quickly

Start with minimal valuable products (MVPs)

In this phase you want to bring in experts to help quickly develop solutions to your business problems.

Set understandable key performance indicators (KPIs) These KPIs will help you evaluate whether a project is successful. In general, we suggest taking a second look at these KPIs after an appropriate duration to decide whether the project is successful or if you should discontinue it. If your business can't pinpoint the right KPIs to measure success, the project is too complex.

Roll-out through company (culture)

Once agreement is reached about which projects would be worth working on, it's time to implement the MVP within your company. It's important that the way you implement it is looked at from both the business and the technical side.

LECTURE 2

AI Industry Adoption Approaches

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Summary

- AI is a cross-industry phenomena
- Three major areas of impact are customer engagement, insights and automation
- Autonomous cars and smart robotics leverage deep learning algorithms
- AI will impact significantly the job market creating new job roles
- Successful AI adoption requires establishing AI capabilities and skills

Resources page 1 of 4

- [1] Beyond the hype: A guide to understanding and successfully implementing artificial intelligence within your business
<https://www.ibm.com/downloads/cas/8ZDXNKQ4>
- [2] A Practical Guide to Building Enterprise Applications: by Tom Markiewicz and Josh Zheng – Feb 2018 O'Reilly
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- [3] The New York Times - Nils Nilsson
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Resources page 2 of 4

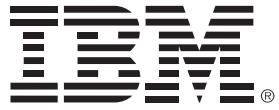
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- [14] This is A.I. Discovery Channel and IBM TV Show
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- [20] CIO – Will AI Really Replace All Our Jobs?
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- [21] Washington Post – Yes the Robots Will Steal Our Jobs
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