



# GERD LEONHARD

## FUTURIST AND CEO THE FUTURES AGENCY

### AUTHOR OF TECHNOLOGY VS HUMANITY



[techvshuman.com](http://techvshuman.com)



[gerd.cloud](http://gerd.cloud)



[gerdtube.com](http://gerdtube.com)



[@gleonhard](https://twitter.com/gleonhard)



[futuristgerd.com](http://futuristgerd.com)



**The Future is  
already here – we  
just have to pay  
more attention!**





**Humanity will change  
more in the next 20  
years than in the  
previous 300 years**





Some things may take much longer than we think, but when they finally happen they are more impactful than we ever imagined





**90% opportunity**  
**10% threat**

**But:**  
**linear thinking**  
**will be**  
**DETRIMENTAL**

Quantum Computing  
Leaps in Material Sciences

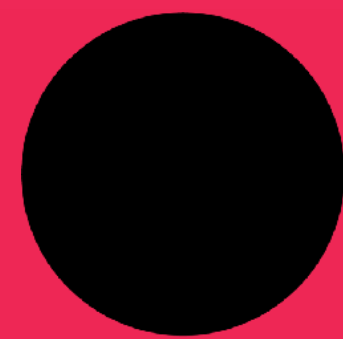
AR / Virtual Reality / MR

Smart-everything & AI

The Internet of Things

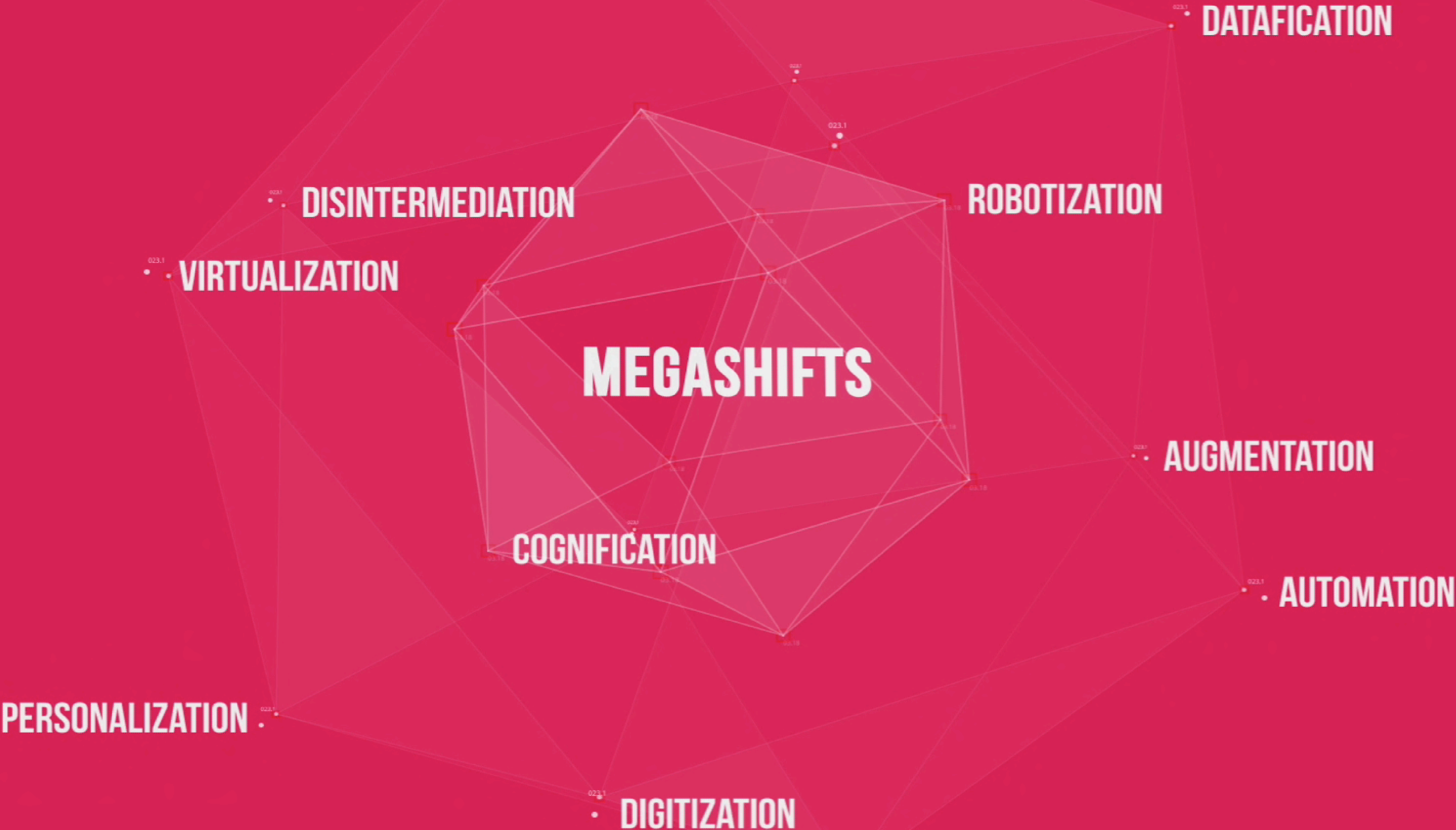
Big<sup>x</sup> Data + Cloud

Hyper-connectivity



1 2 **4** 8 16 32 64 128













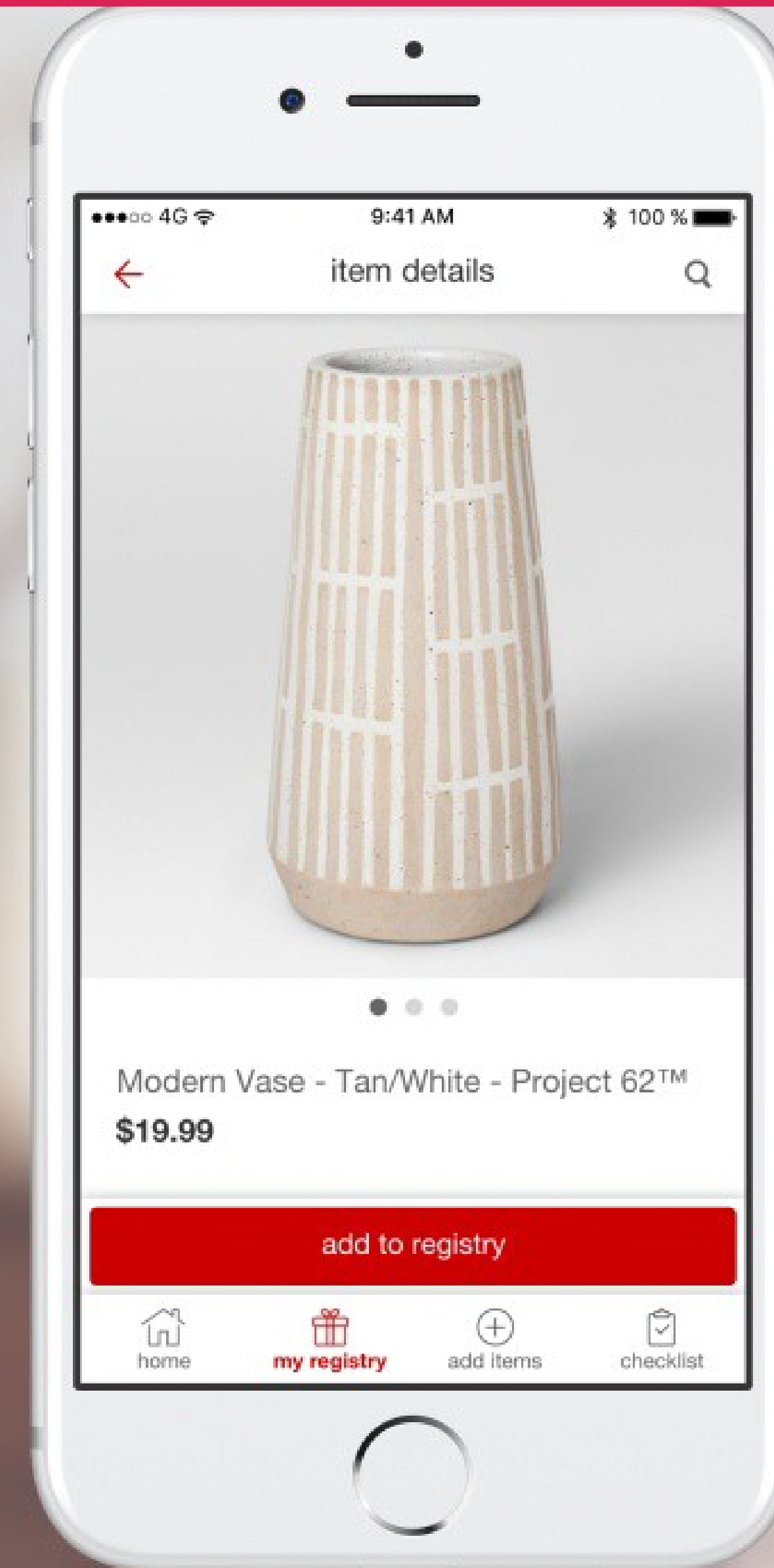








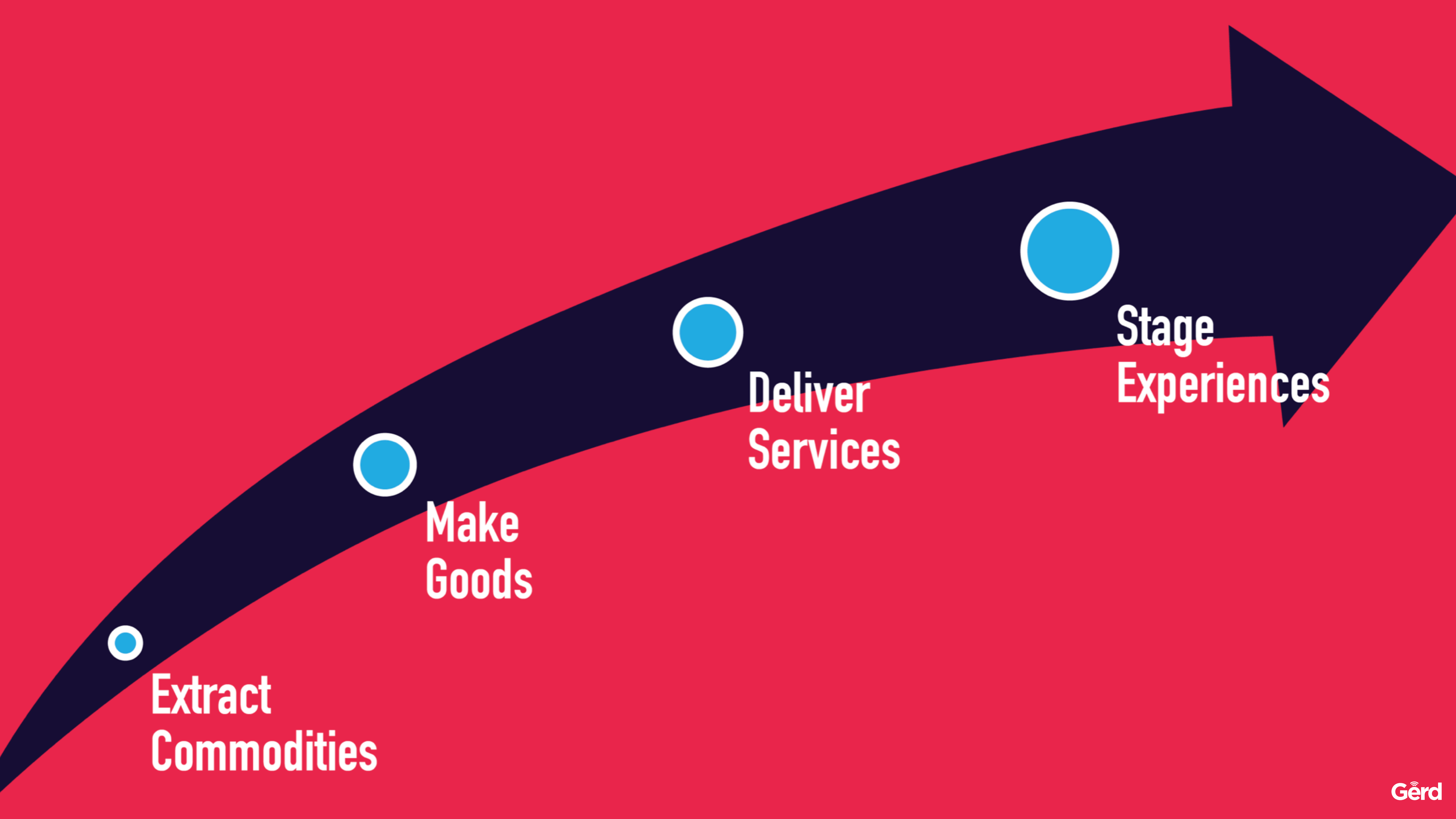












**Extract  
Commodities**

**Make  
Goods**

**Deliver  
Services**

**Stage  
Experiences**

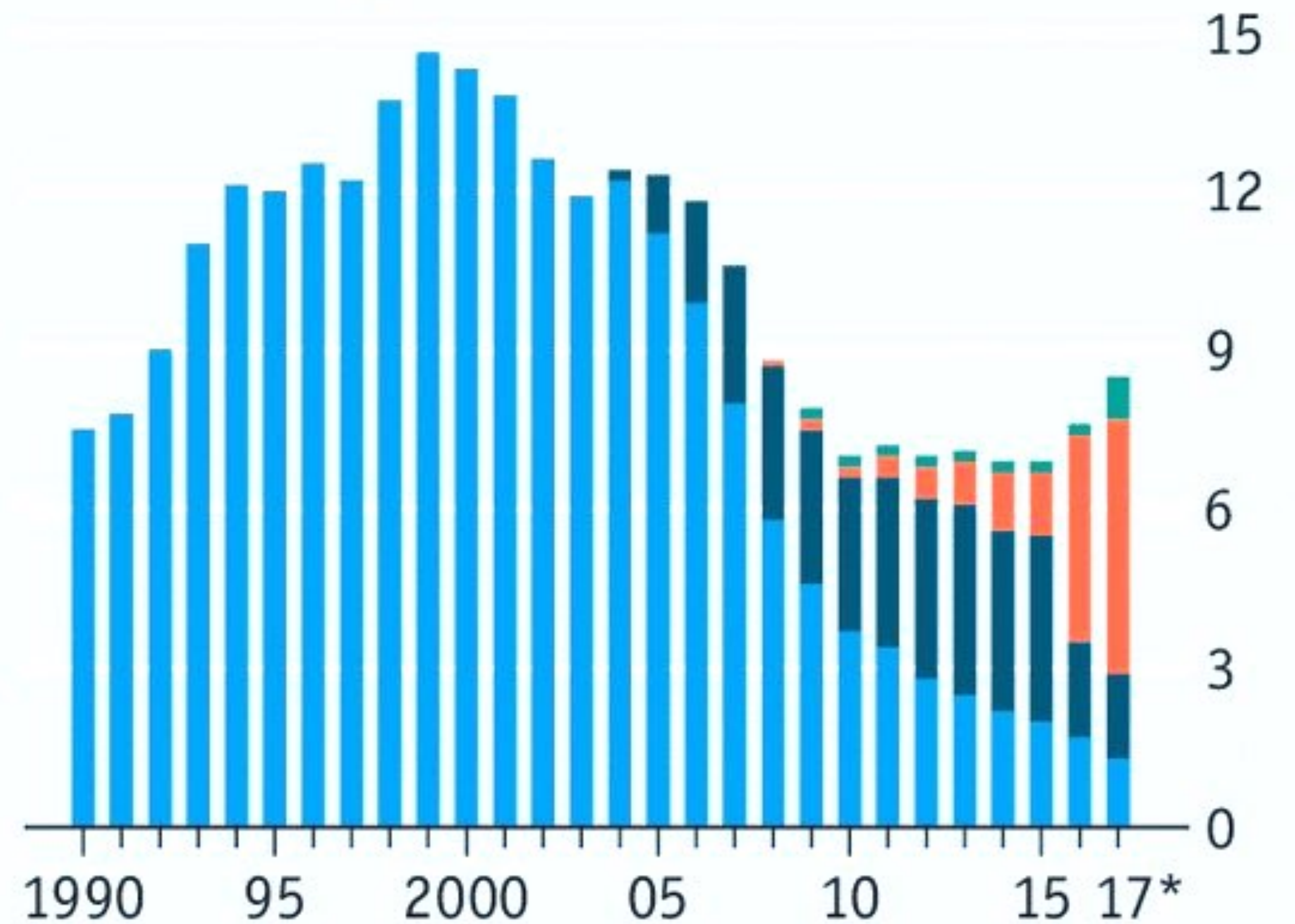


**‘Gradually,  
then suddenly’  
is the new normal!**

## A stream becomes a river

United States, recorded music revenues, \$bn

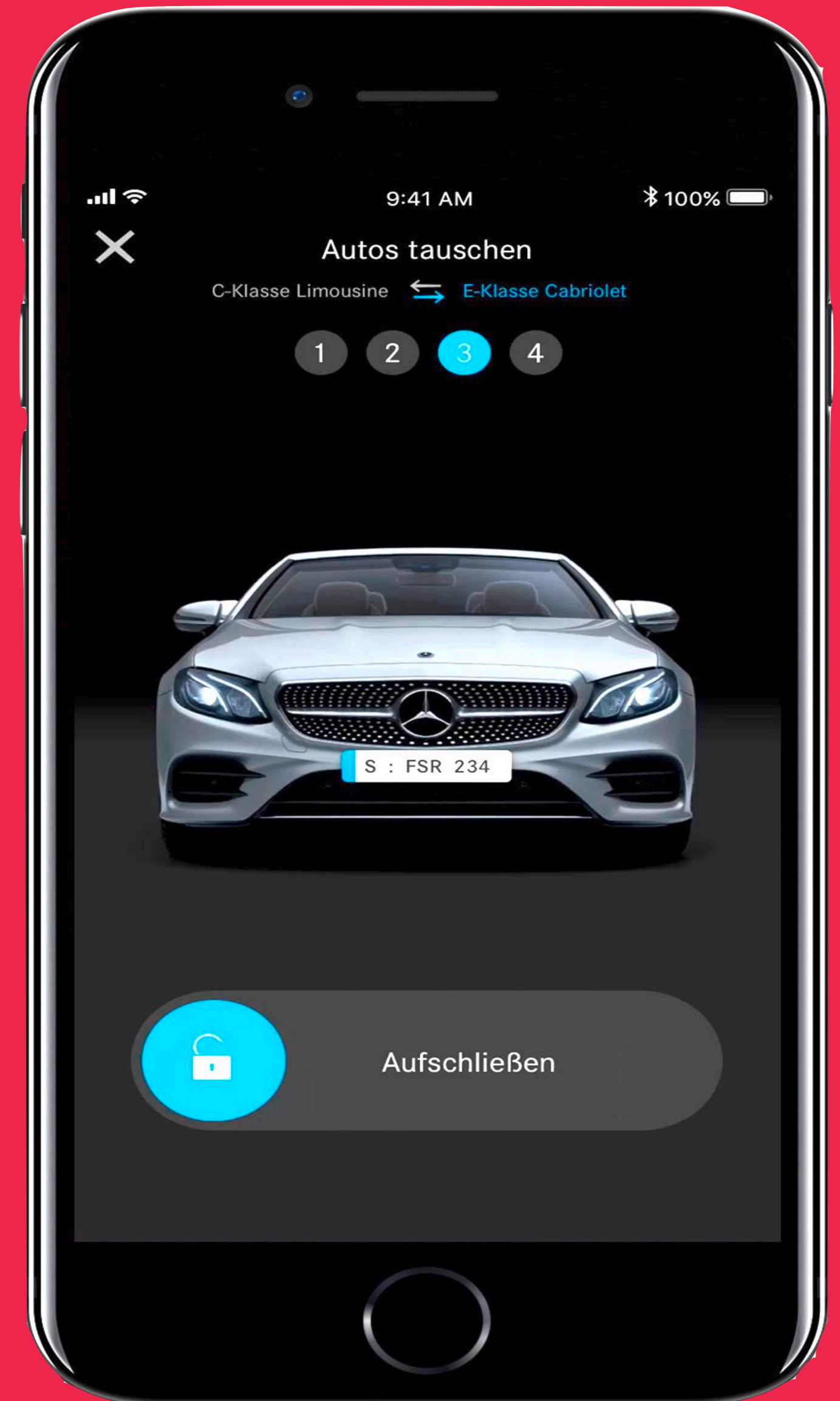
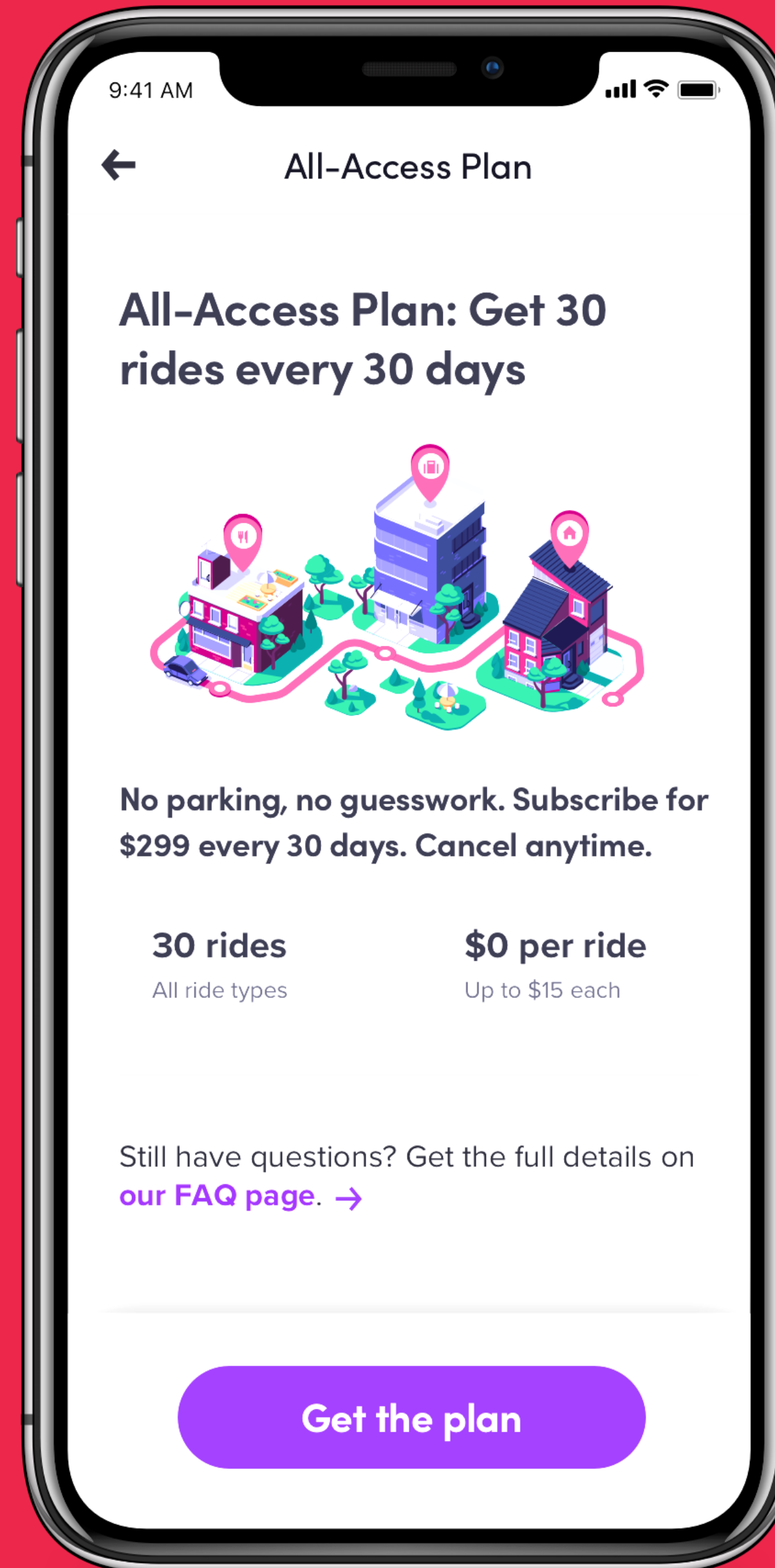
Physical Digital downloads  
Streaming Other



Sources: RIAA; MIDiA Research

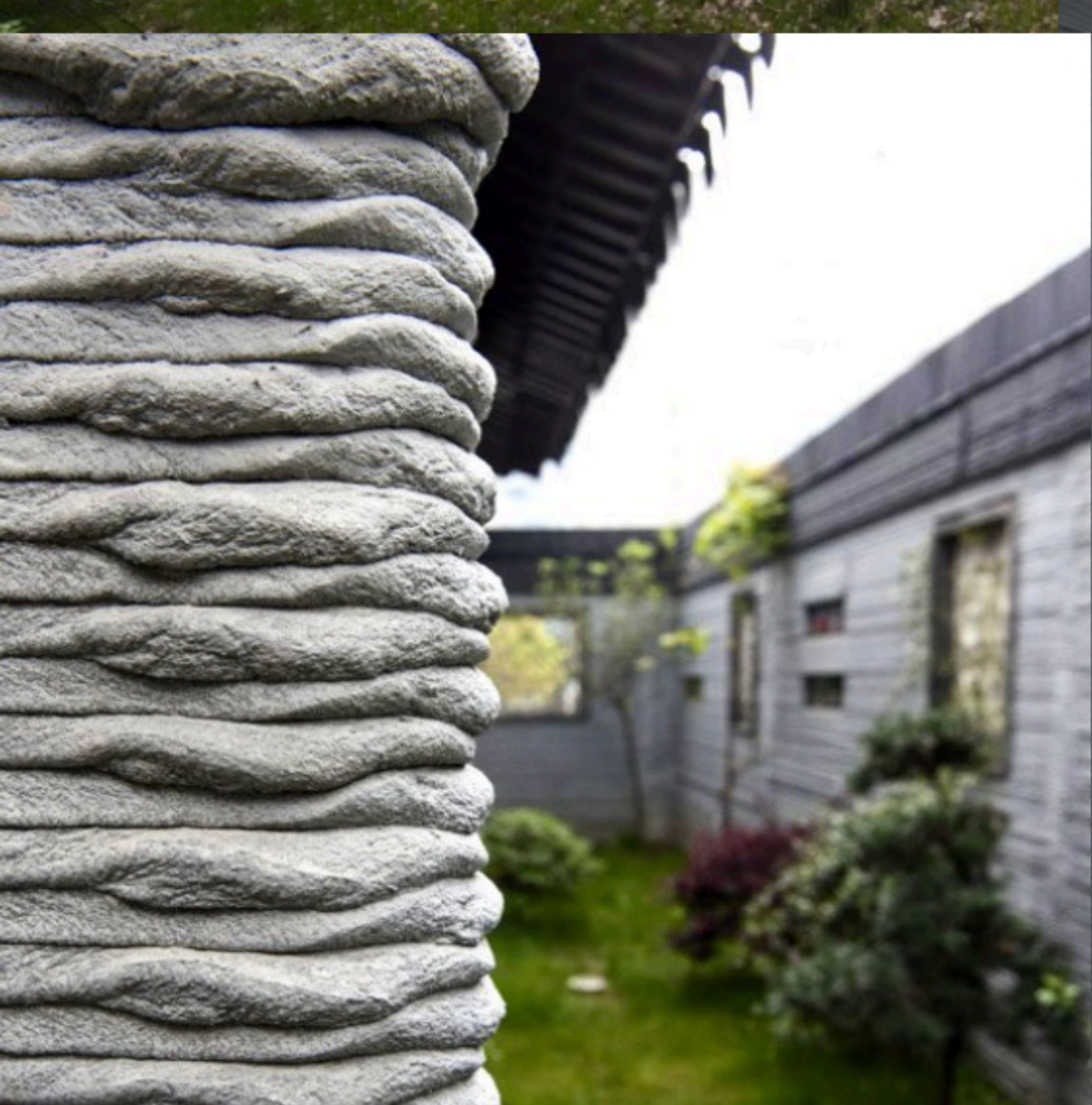
\*Estimate

**‘Gradually,  
then suddenly’  
is the new normal!**





Science fiction is increasingly becoming science fact: imagination required!



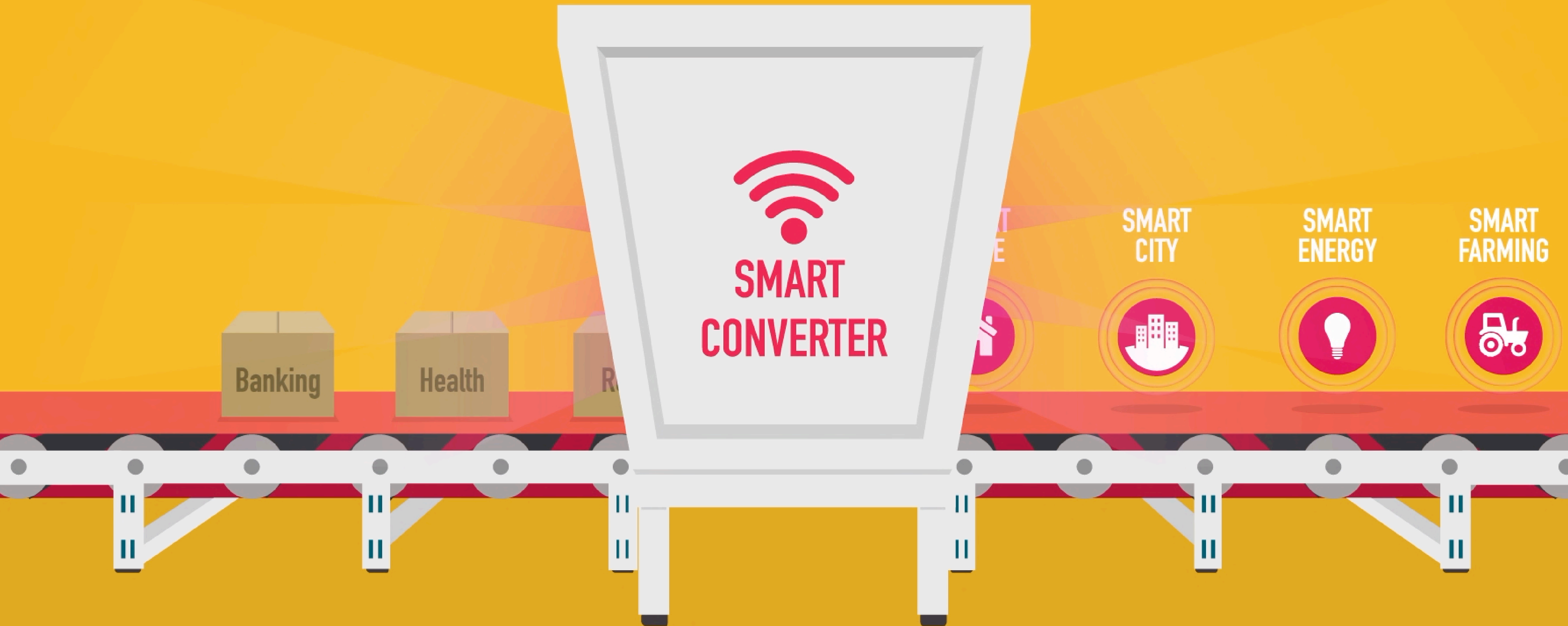


Science fiction is increasingly becoming science fact: imagination required!





# Smart everything, everywhere, anytime: IA (not AI)

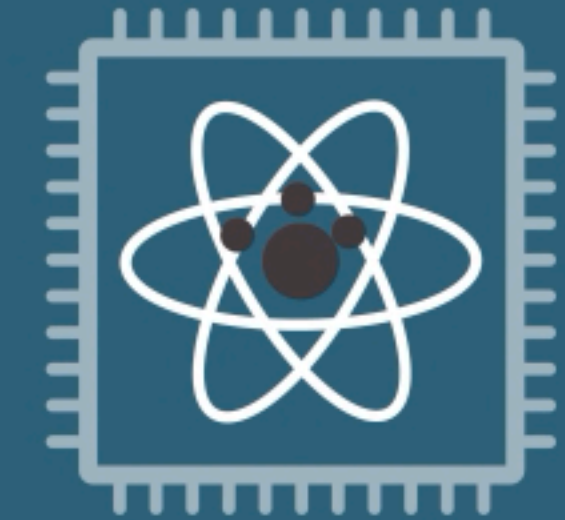


**Note: smart everything does not mean 'no humans' – but routines are for machines!**

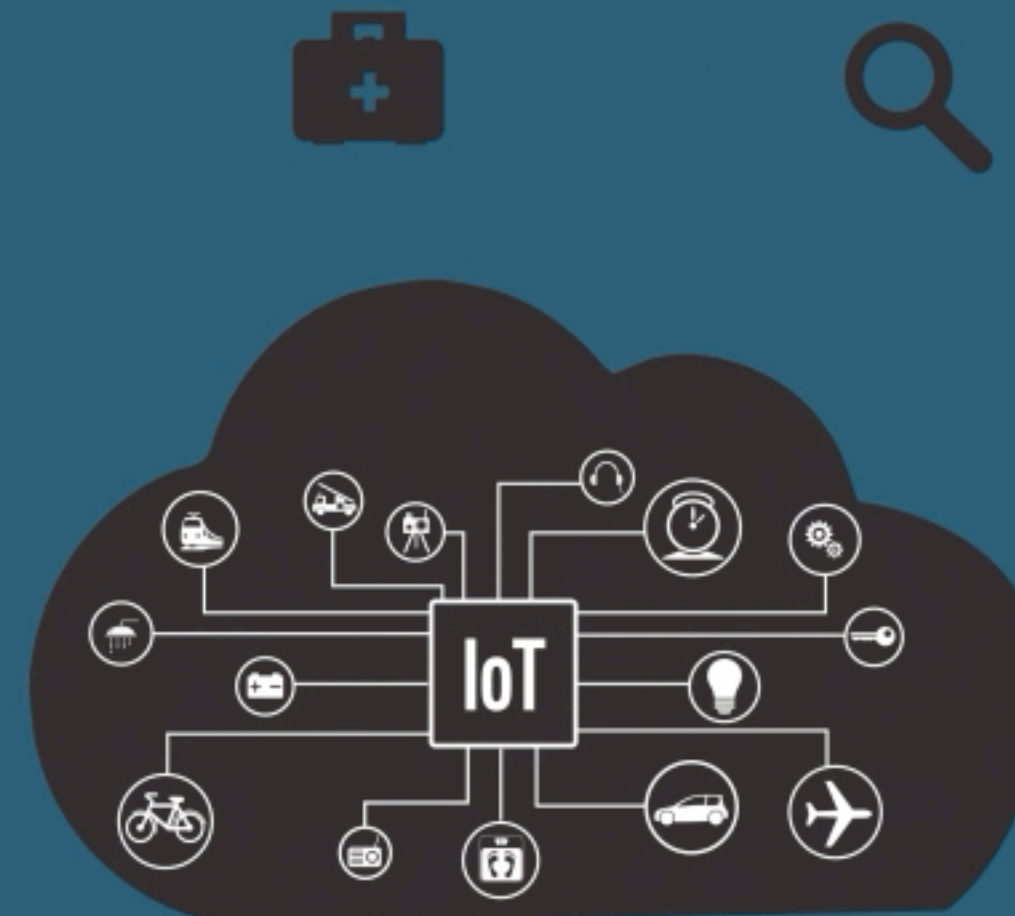


# The 8 technological game-changers

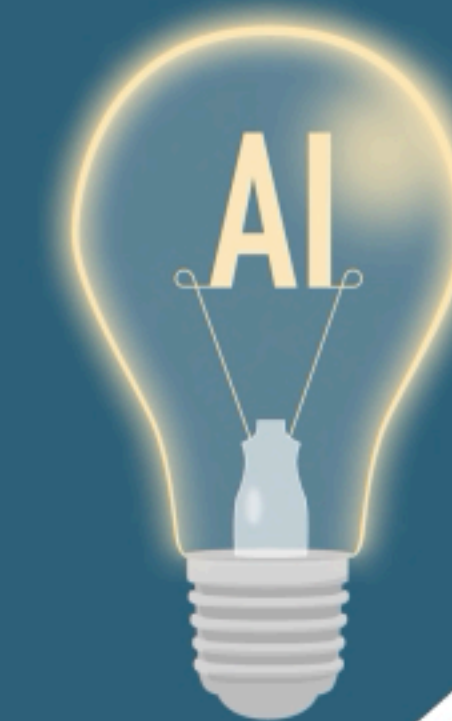
COMPUTE EVERYTHING



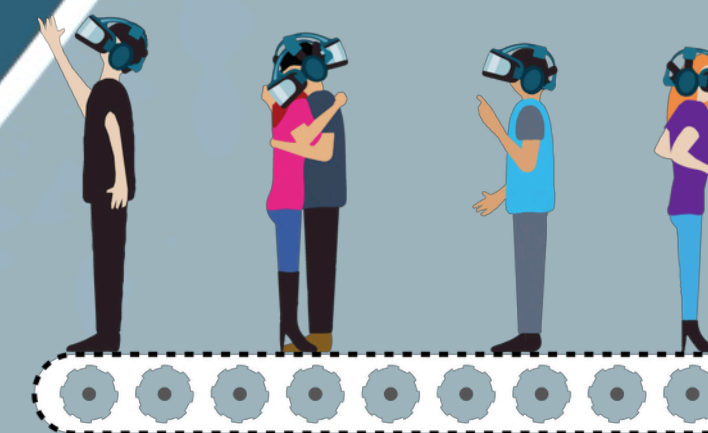
NETWORKED EVERYTHING  
CLOUD EVERYTHING



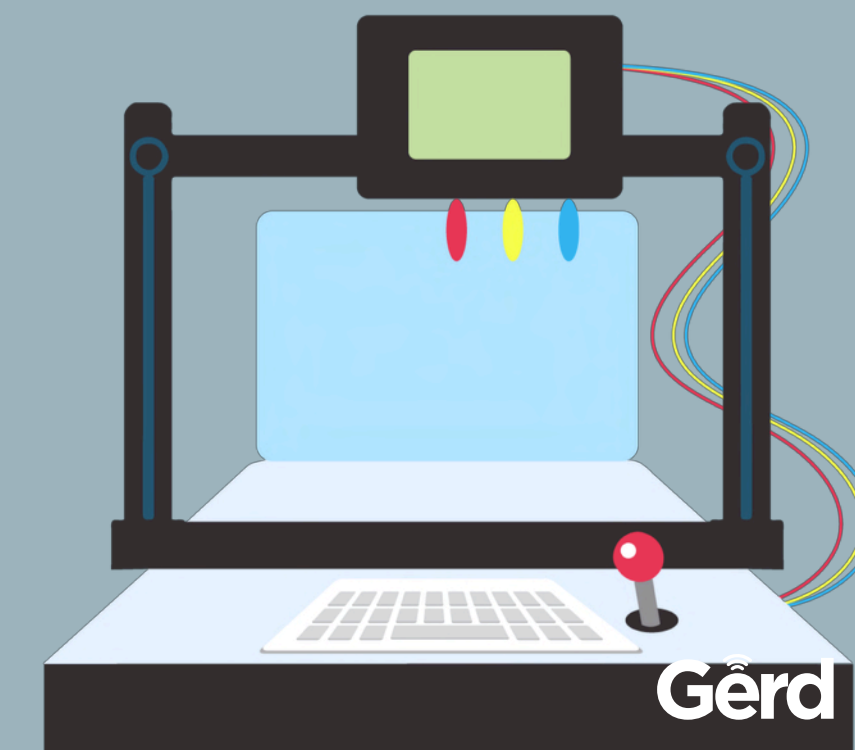
SMART EVERYTHING



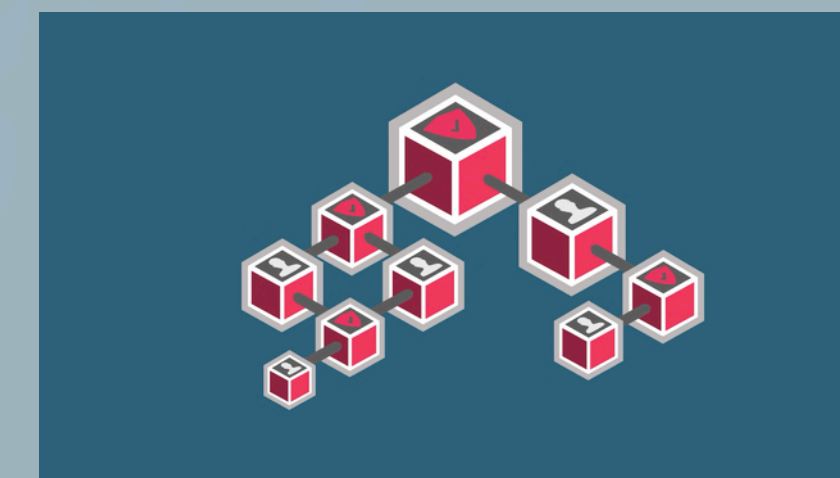
SEE ANYTHING



MAKE ANYTHING



TRANSACTION ANYTHING

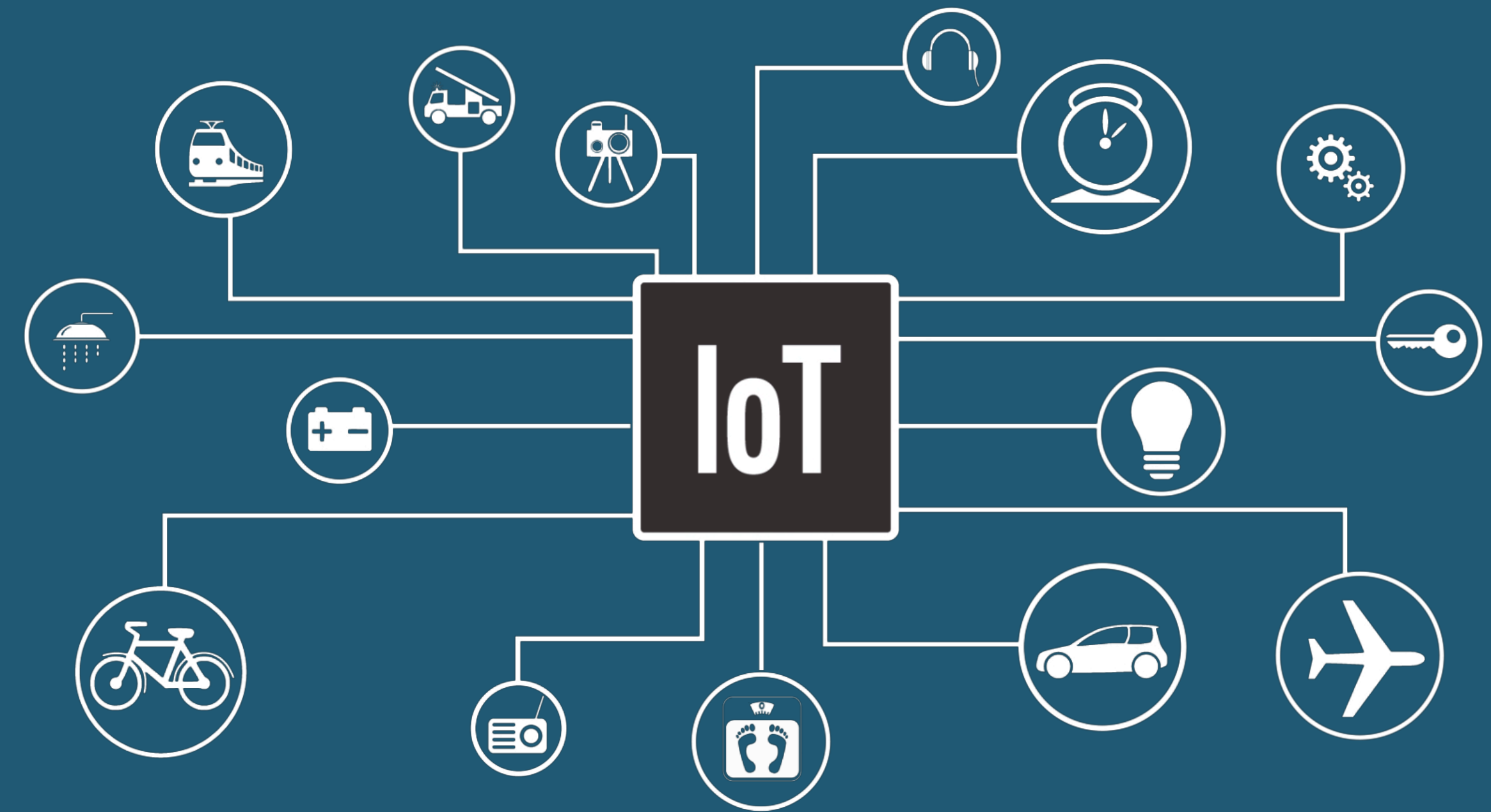
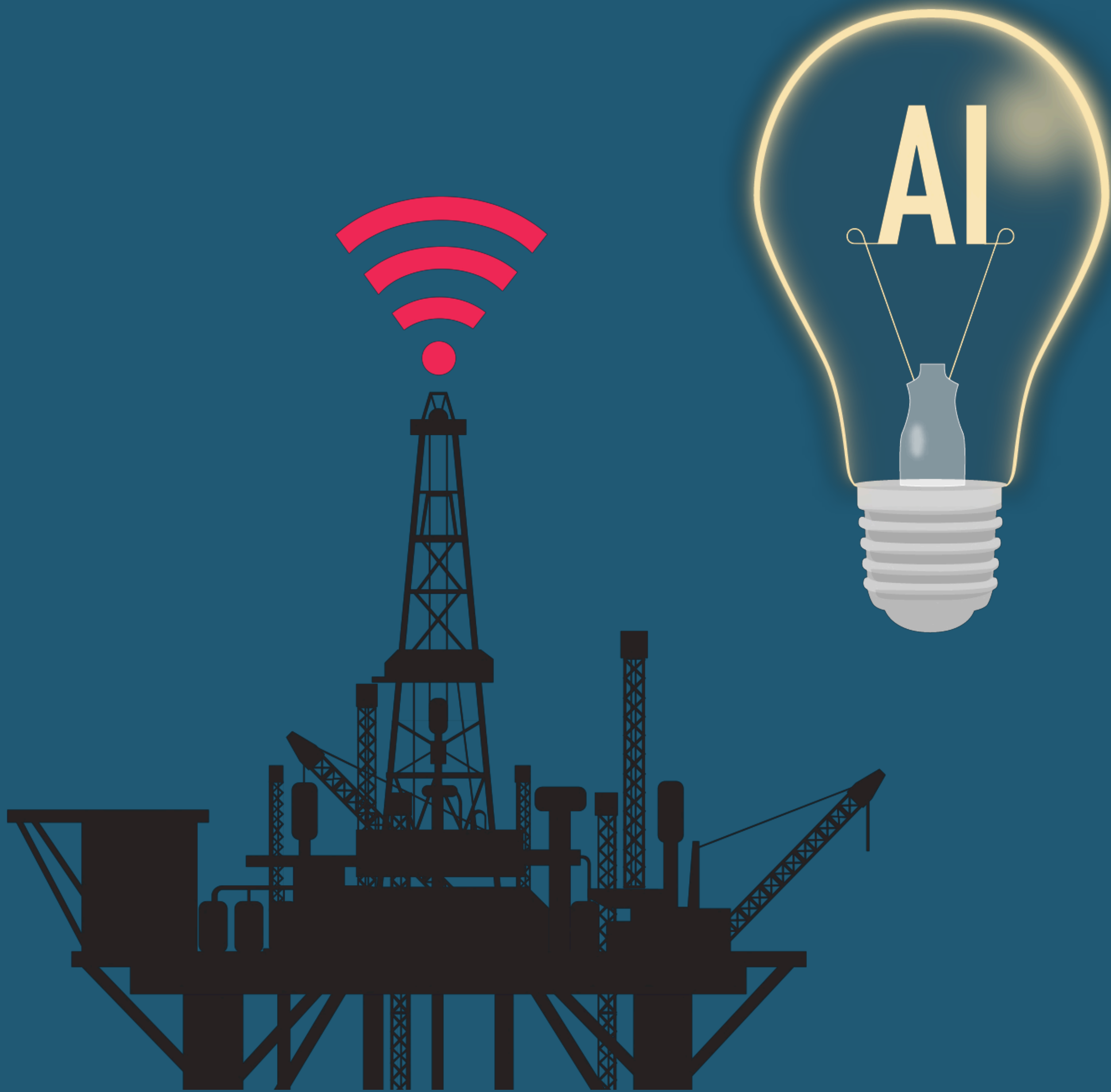


DATA EVERYTHING





Data is the new Oil. AI is the new electricity. The IoT is the new nervous system.

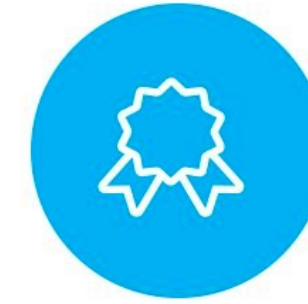




# Blockchain enabled Supply Chain Platform

## Key Features & Enabler

Value Add



Digital  
Ownership  
Certificates



Asset &  
Assembly  
Tracking



Proof of  
Origin



Trusted  
Maintenance  
Tracking



Integrated  
Financial  
Transactions



Collaborative  
Product  
Master Data

Enabler



Integration in existing  
manufacturing  
process



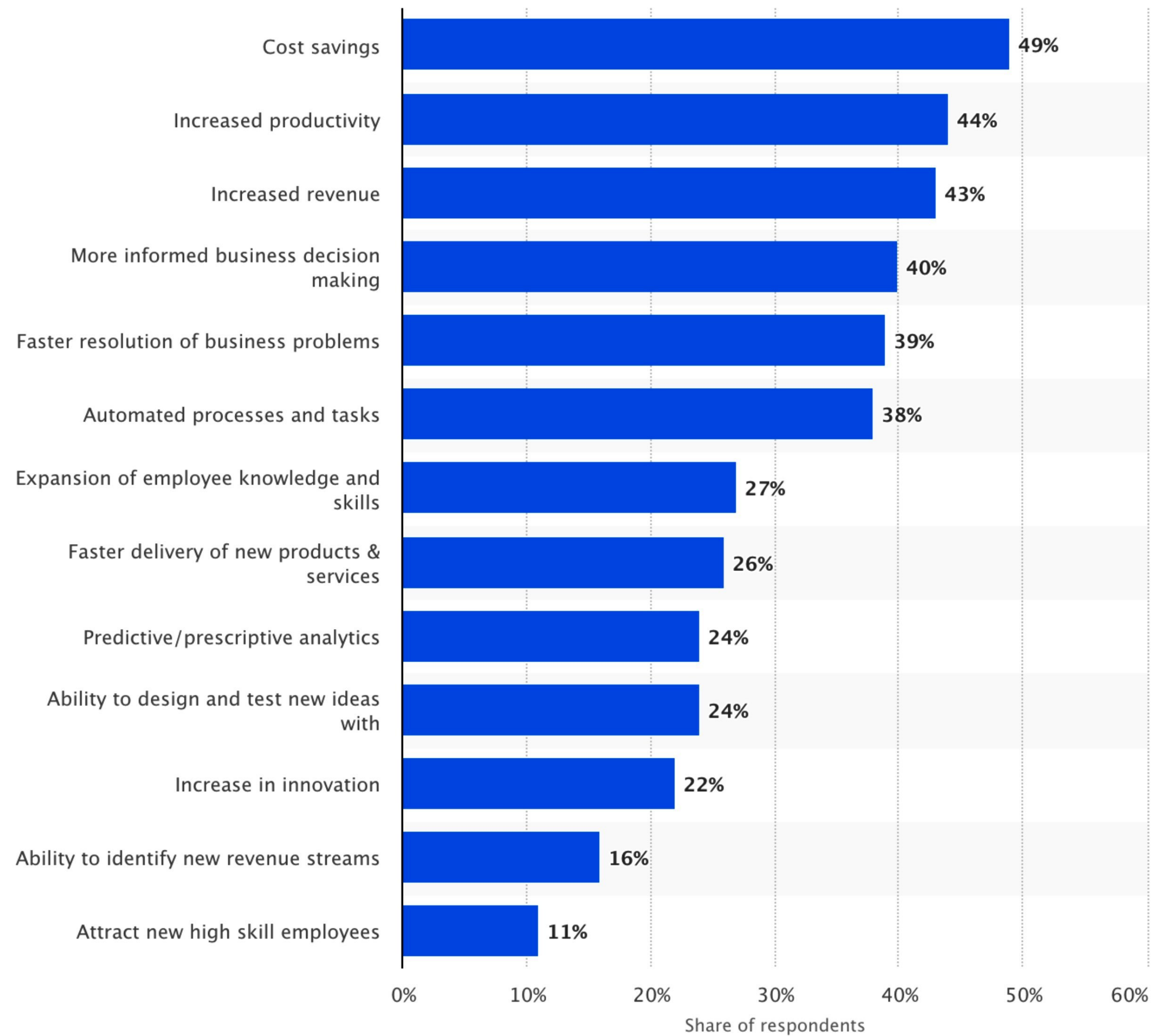
Trusted Devices



Asset  
Management  
System



In the  
field  
interface

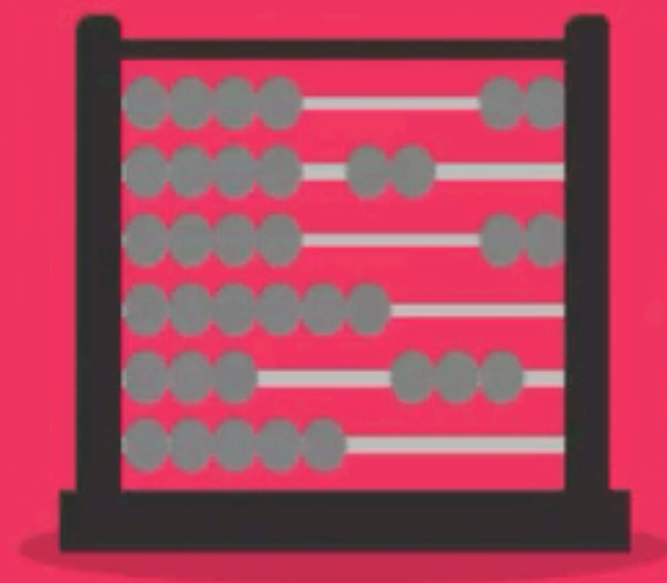


Benefits of AI for Retail (Survey). Statista (2018).



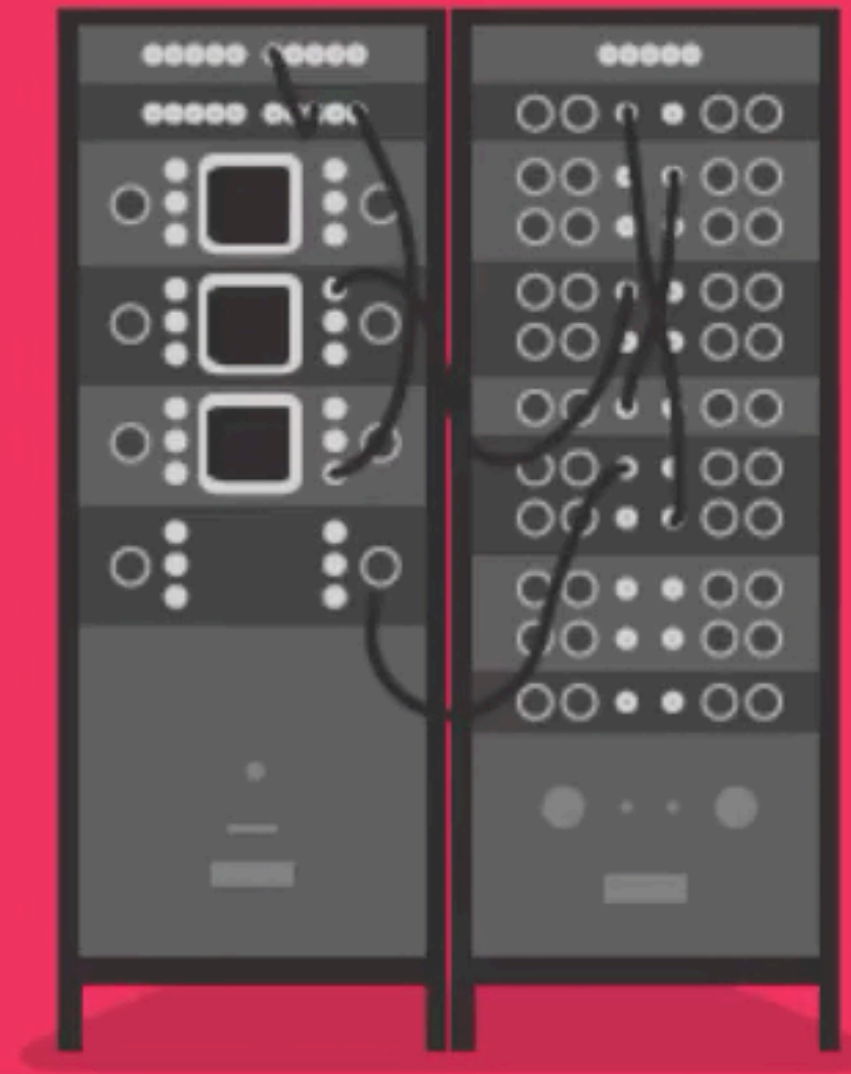
# AI: Computer systems that turn information and data into KNOWLEDGE

(Demis Hassabis, CEO, DeepMind)



*Tabulating  
Systems Era*

1900



*Programmable  
Systems Era*

1950



*Cognitive  
Systems Era*

2020

# AI: Computer systems that turn information and data into KNOWLEDGE



**MED MATCH**

**MEN'S VORTEX TRICLIMATE® JACKET**  
\$280.00




**MED MATCH**

**MEN'S THERMOBALL™ SNOW TRICLIMATE® PARKA**  
\$349.00



**MED MATCH**

**MEN'S MARSELLUS TRICLIMATE® JACKET**  
\$280.00



**HIGH MATCH**

**MEN'S POINT IT DOWN HYBRID JACKET**  
\$380.00



**MED MATCH**

**MEN'S GATEKEEPER 2.0 JACKET**  
\$299.00



**MED MATCH**

**MEN'S APEX STORM PEAK TRICLIMATE® JACKET**  
\$299.00


**WHAT FEATURES DO YOU WANT IN YOUR JACKET?**

*e.g. "I NEED IT TO BE PACKABLE"*

RESTART ↺ SKIP →



# “Machine learning is the science of giving computers the ability to learn and find insights without explicitly programming the machines on what to do”

 San Francisco, CA, United States

Dates

09/02/201609/09/20161 Guest

Room Type

Entire home/apt

Private room

Shared room

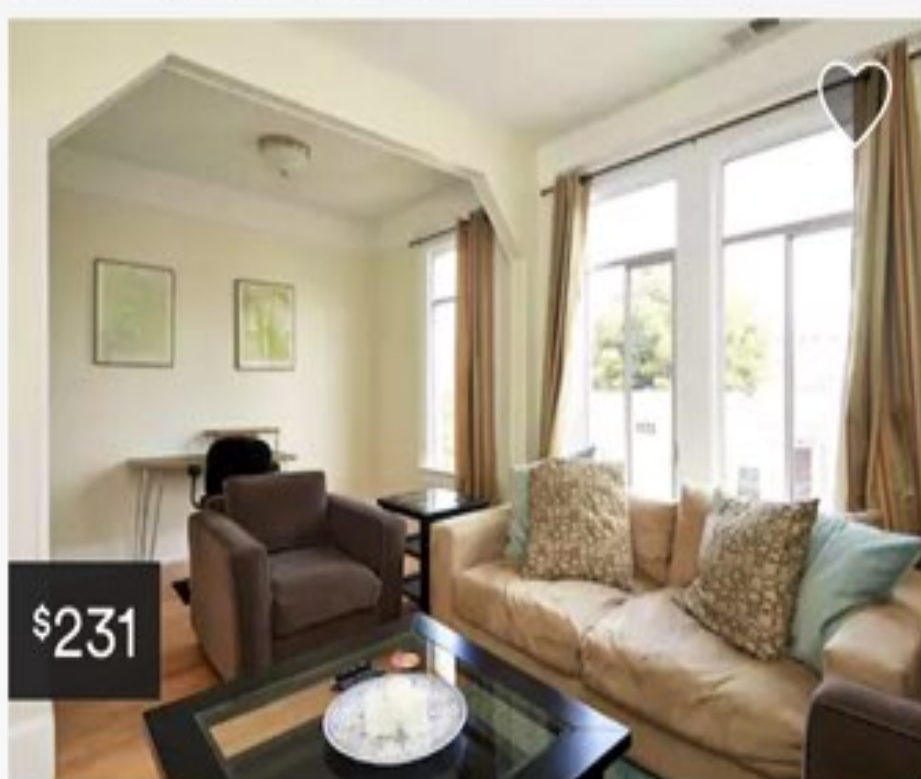
Price Range

\$10\$216 Average\$452

Filters

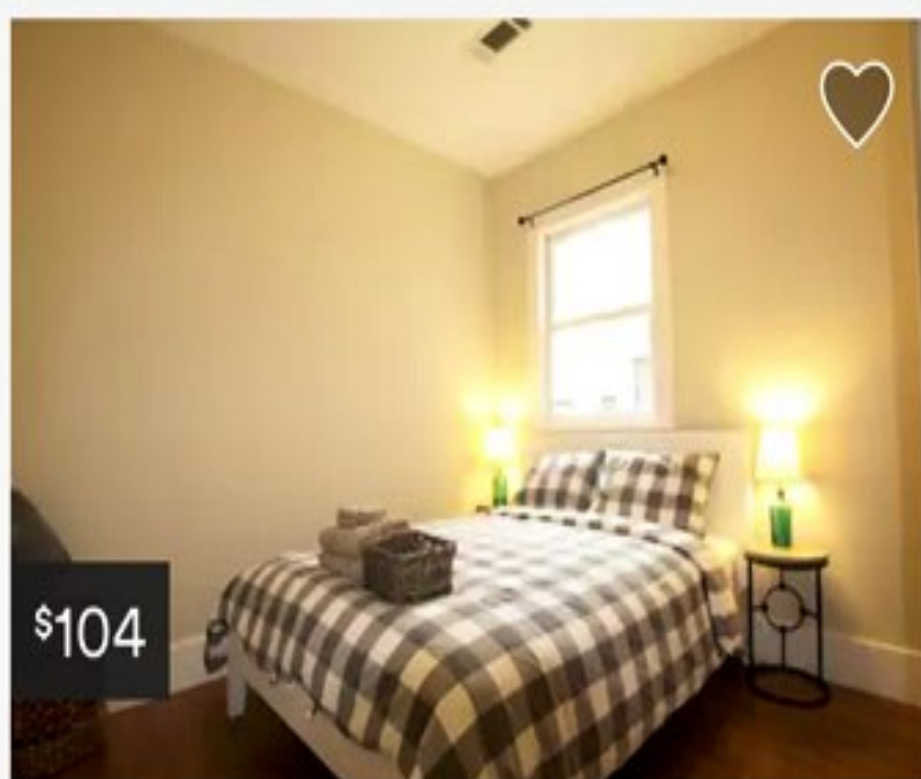
Only 10% of listings are left for these dates.  
We recommend booking soon, or trying different dates.

Additional fees apply. Taxes may be added.




\$231


Renovated elegant Victorian w/ yard  
Entire home/apt · 4 guests · ★★★★★ · 148 reviews

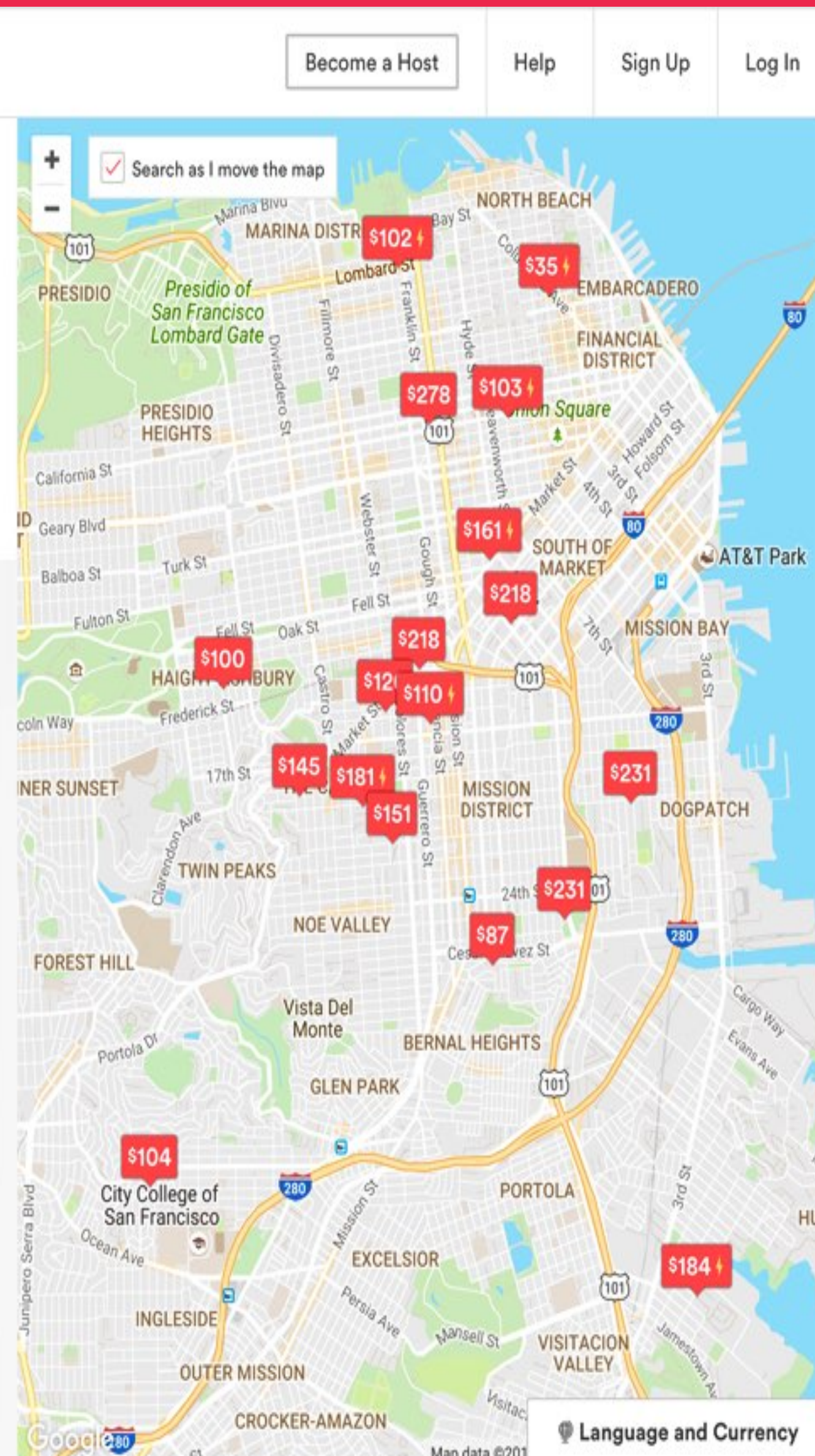


\$104

NEW Private room near CCSF, easy parking, quiet...  
Private room · 2 guests



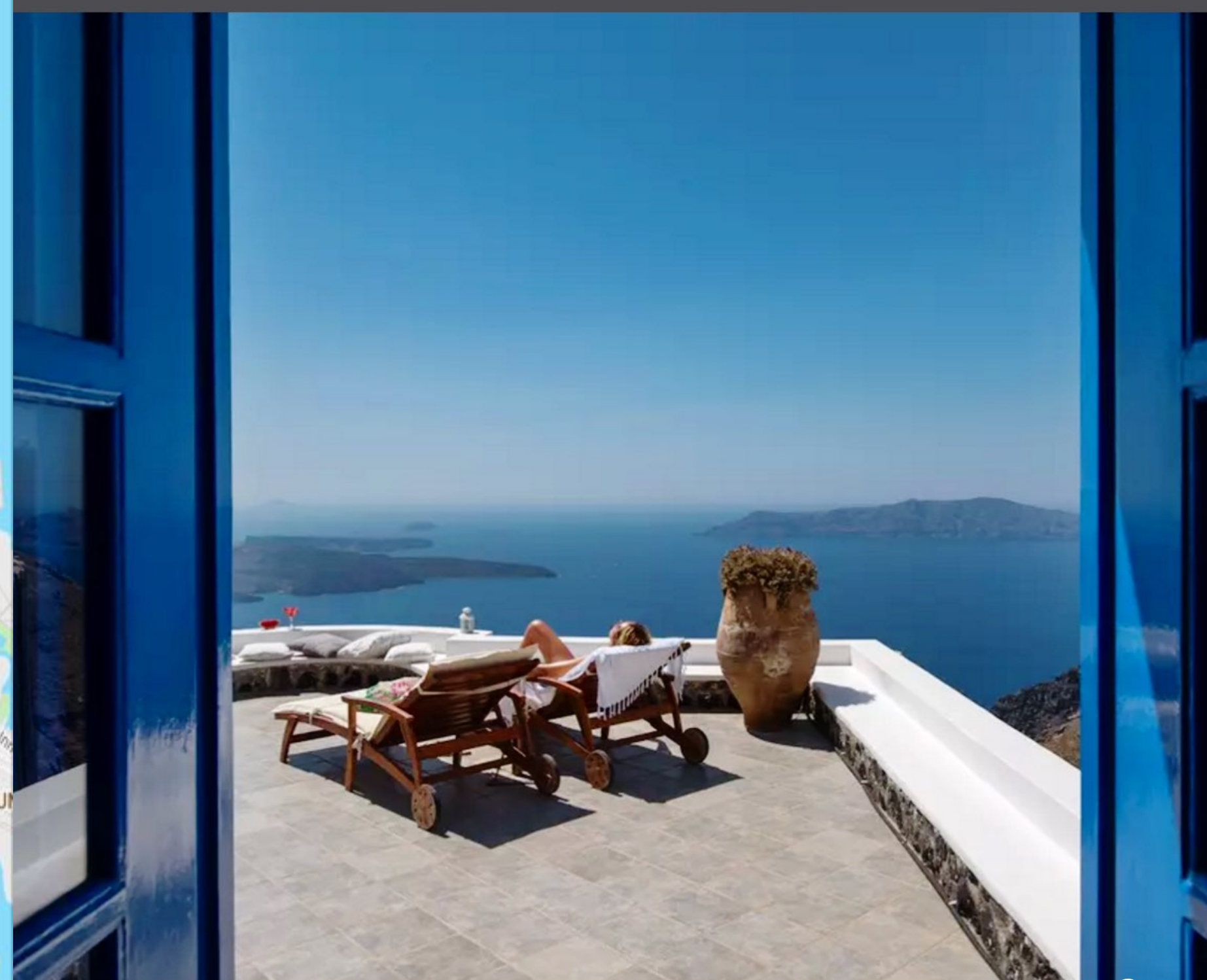




## Using Machine Learning to Predict Value of Homes On Airbnb

by Robert Chang  
Robert Chang · Jul 17, 2017

Data @Airbnb, previously @Twitter. Naturally opinionated, but opinions are my own



Amazing view from a Airbnb Home in Imerovigli, Egeo, Greece



**“Machine learning is the science of giving computers the ability to learn and find insights without explicitly programming the machines on what to do”**





# How AI is spreading throughout the supply chain

2 hours ago

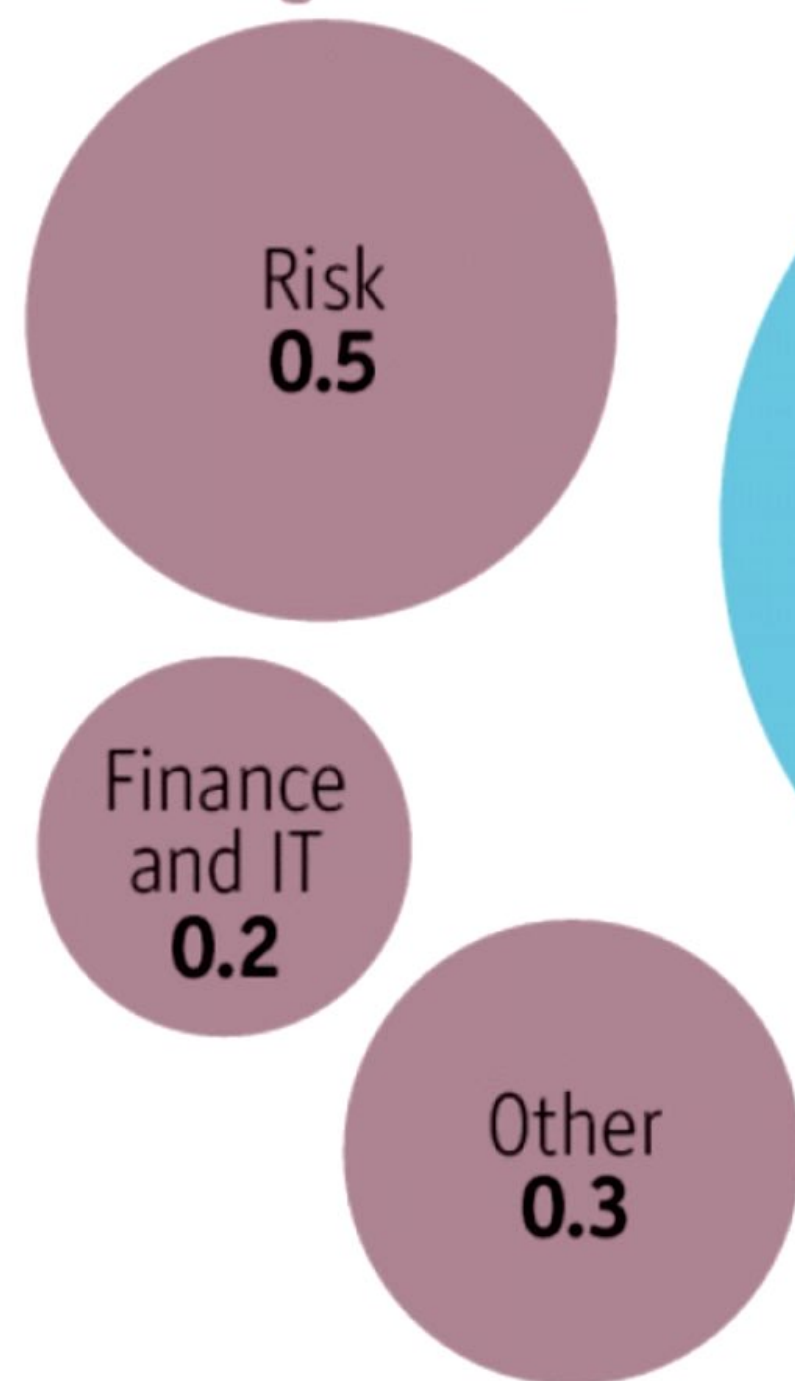
*AI is making companies swifter, cleverer and leaner*

## Ballooning

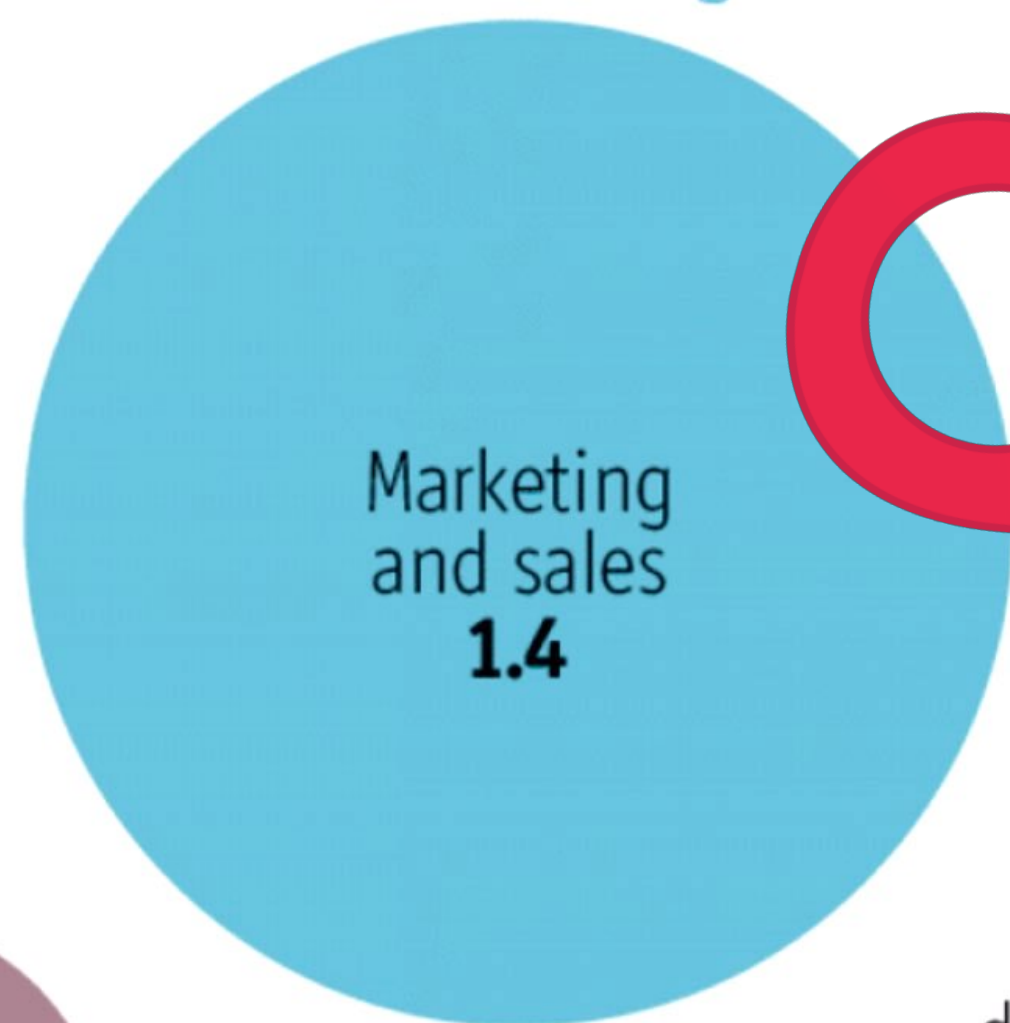
Potential economic-value creation from AI in the next 20 years

\$trn

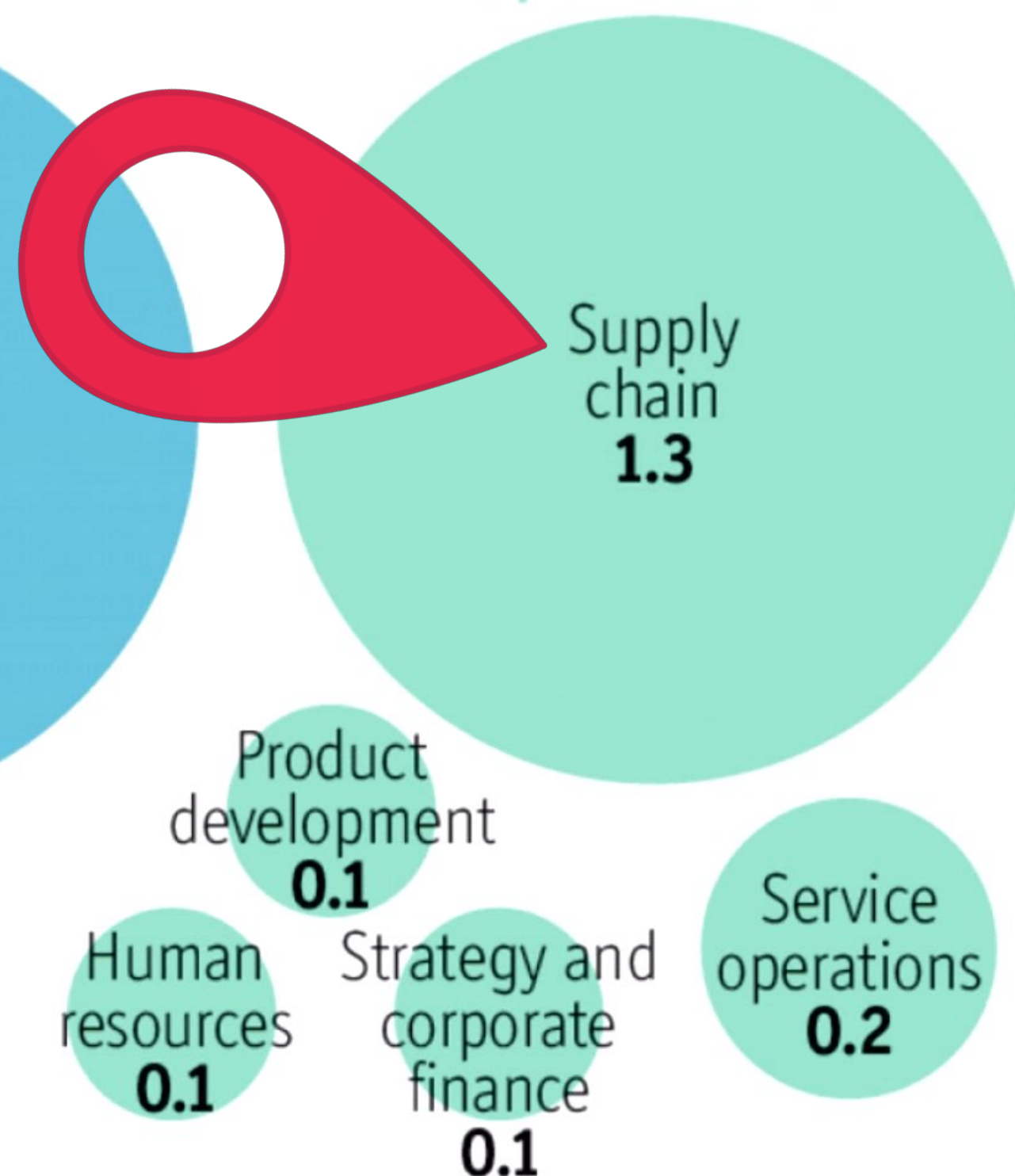
### Management



### Marketing



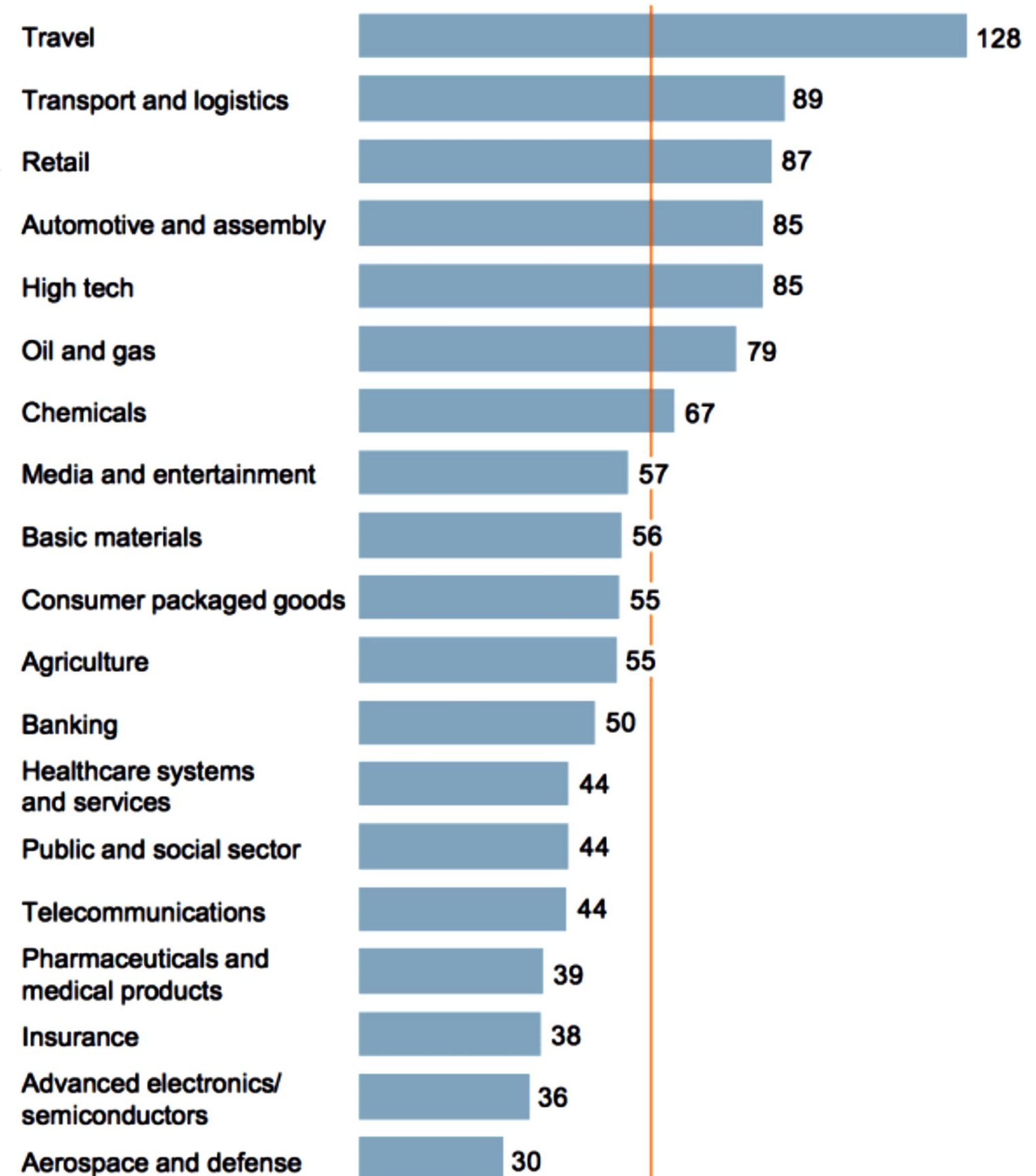
### Operations



Source: McKinsey

Economist.com

## Potential incremental value from AI over other analytics techniques

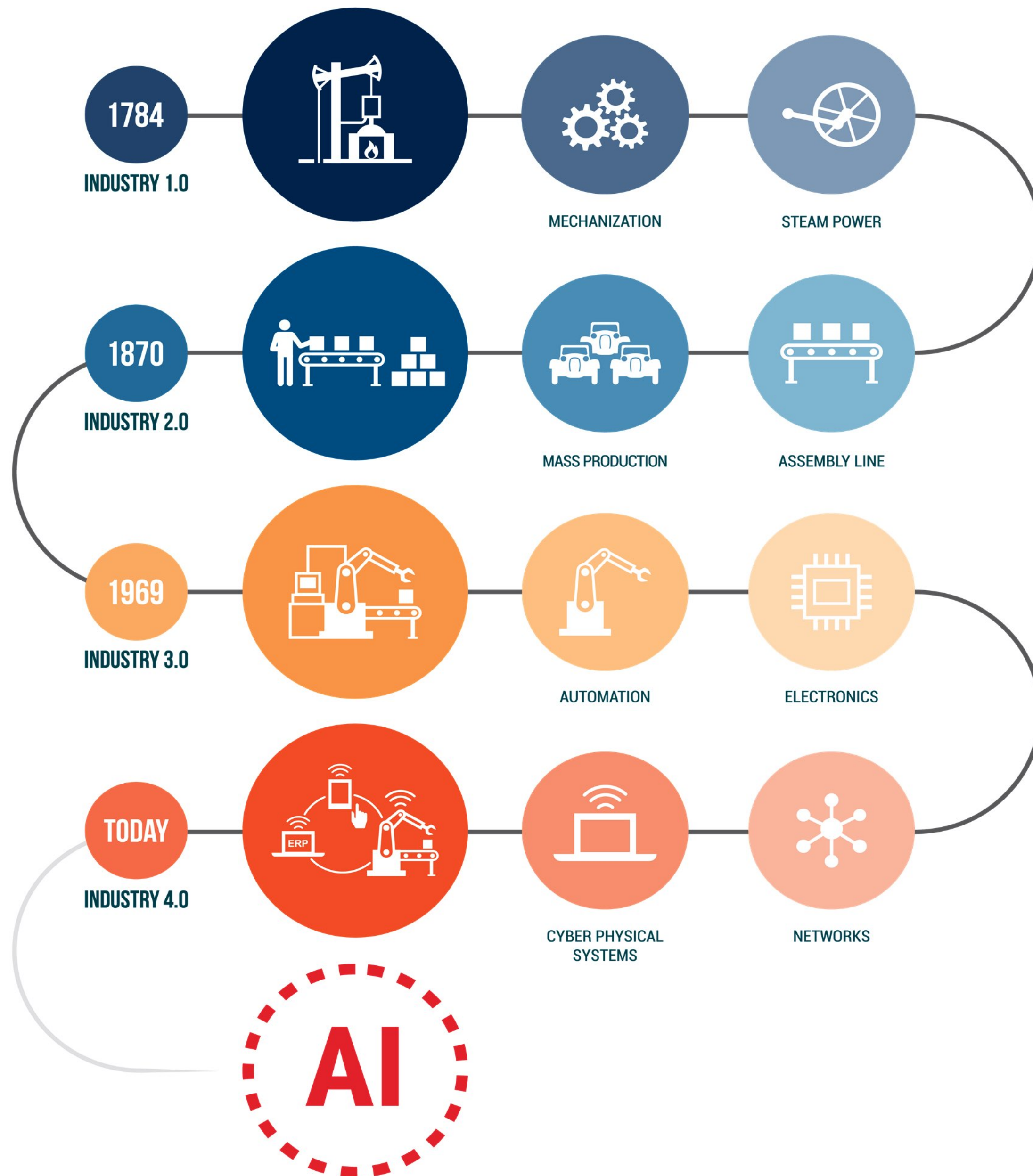


McKinsey Report: AI Promises Added Value of Up to US\$5.8 Trillion

Average = 62



# The factory of the future: humans will move up the value chain



## AT THE CUSP OF THE 5<sup>TH</sup> INDUSTRIAL REVOLUTION

Recent rapid adoption and application of artificial intelligence algorithms — triggered by access to big data and better hardware-processing capabilities — are changing the face of blue and white collar jobs.



# IA and narrow AI is disruptive – but AGI will bring existential risk. Who will be ‘Mission Control?’

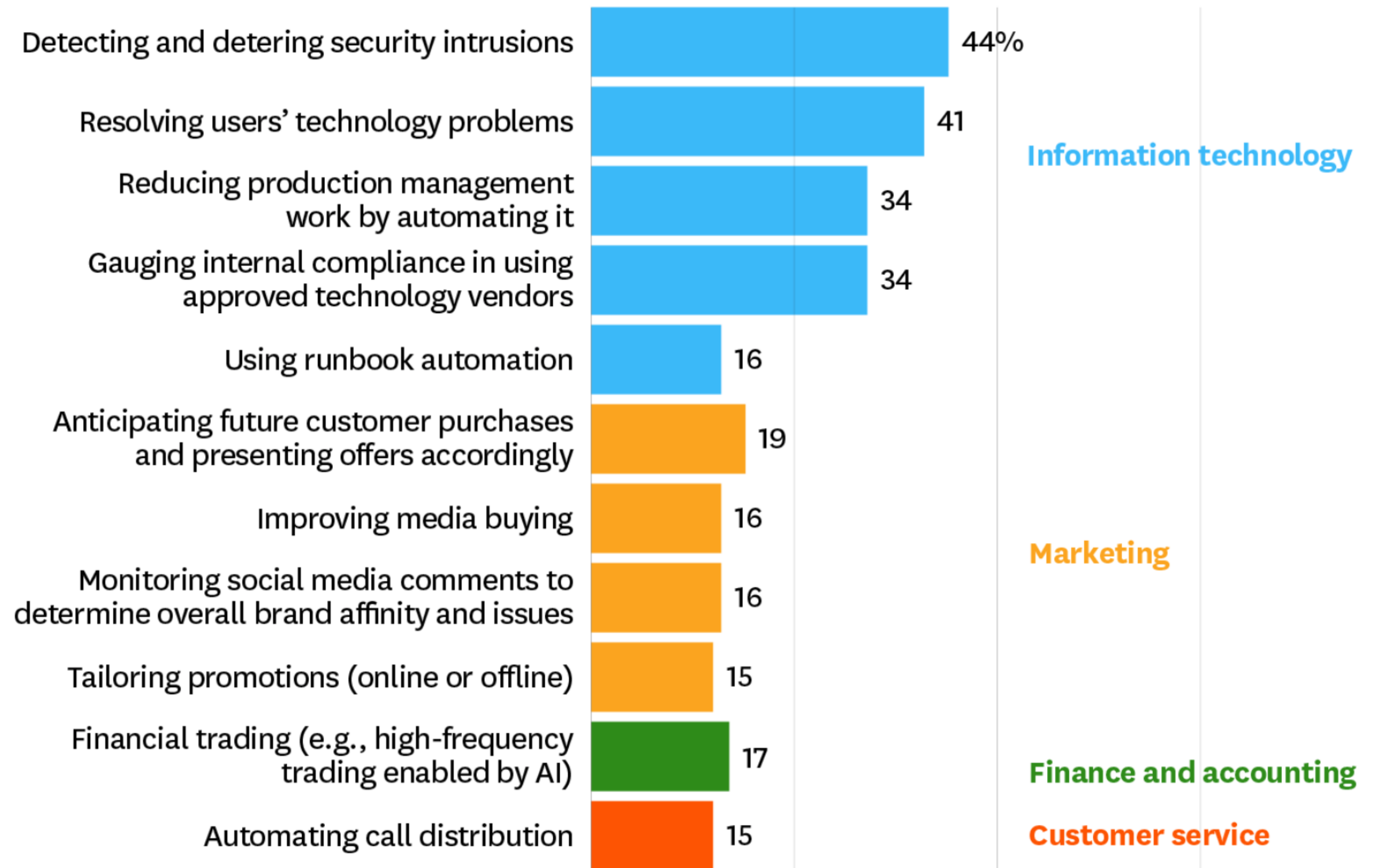




# Ignore Hollywood: for the next 5 years it's all about smart software (IA) \*

## How Companies Around the World Are Using Artificial Intelligence

IT activities are the most popular.

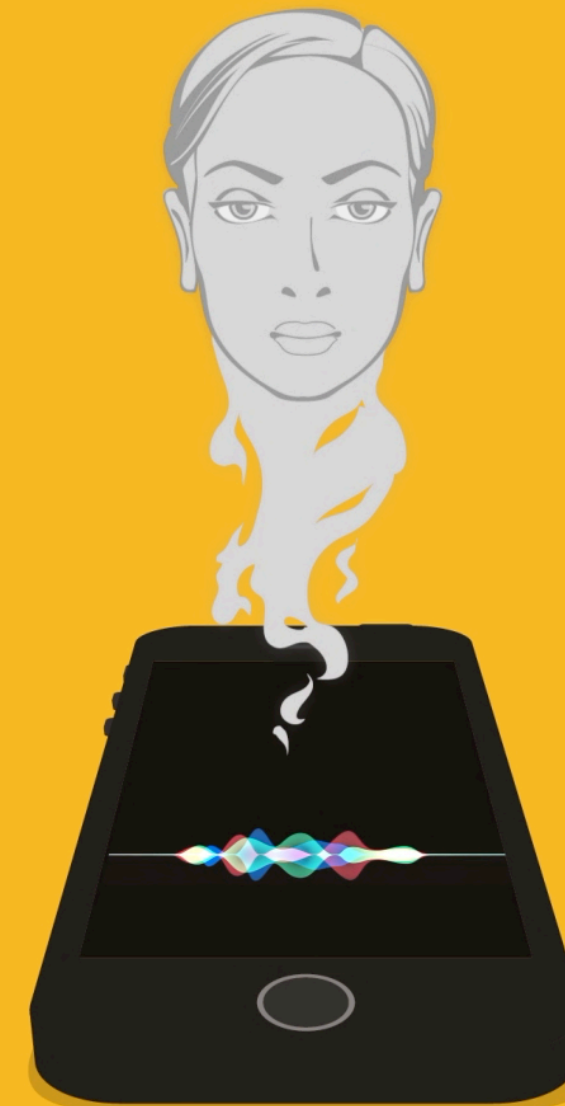


SOURCE TATA CONSULTANCY SERVICES SURVEY OF 835 COMPANIES, 2017

© HBR.ORG

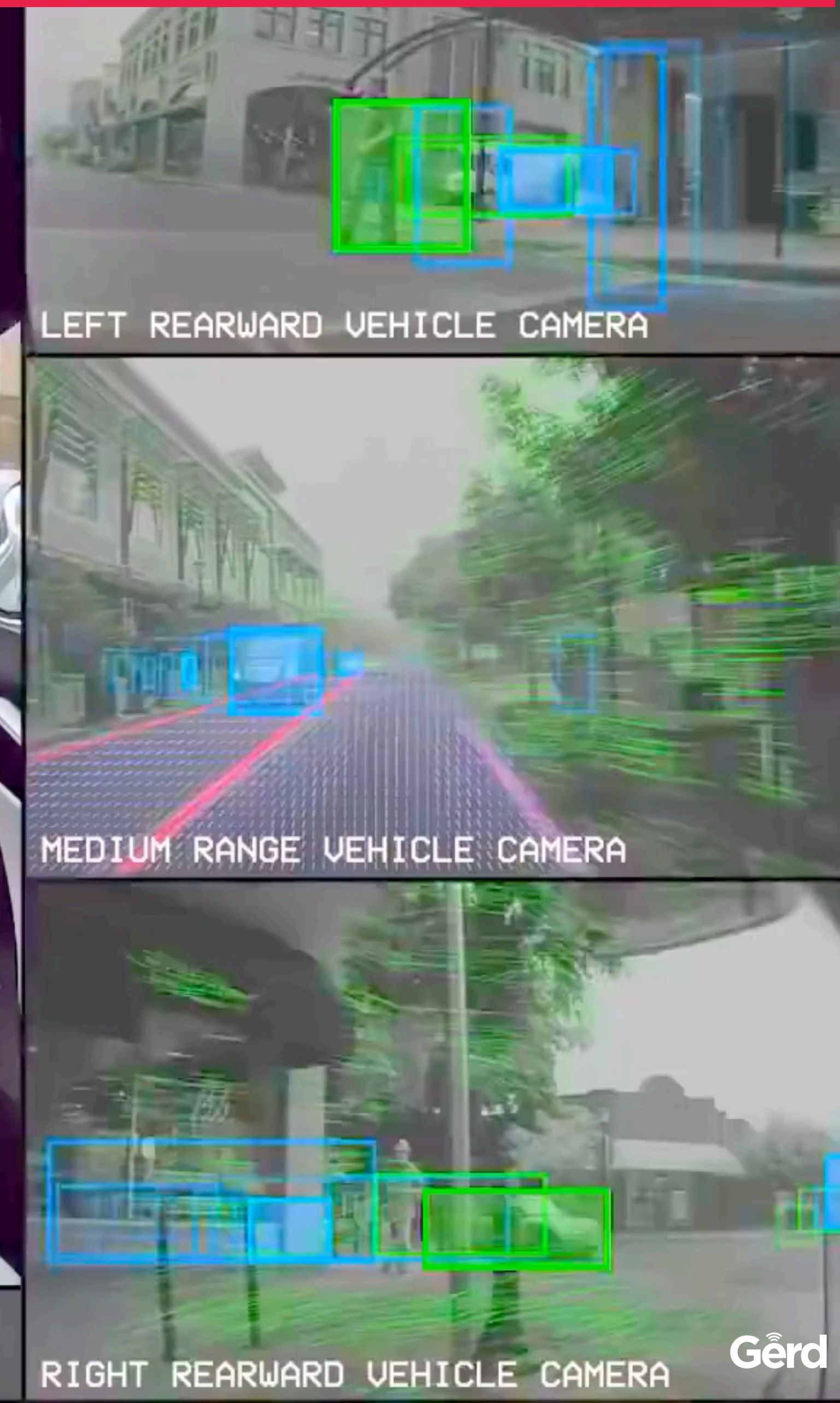
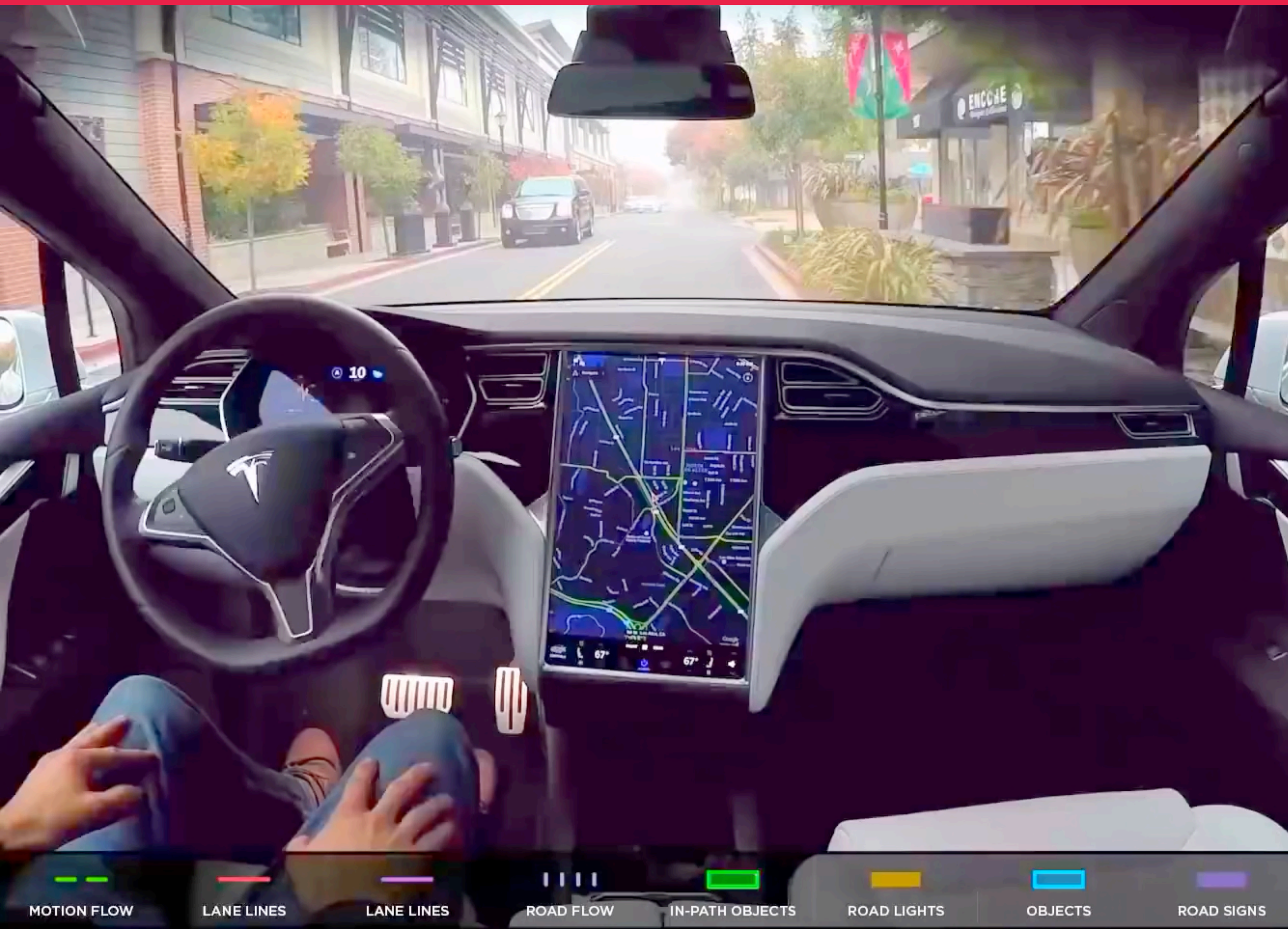


**Smart and networked machines: keep humans in the loop, implement ethics guidelines, beware of machine thinking and automation bias, experiment but keep asking 'why'!**





# Amazing new opportunities 🌐 Tough new responsibilities





# Amazing new opportunities Tough new responsibilities

## SENSEVIDEO

2017-03-28 TUE 09:57:48

Camera 1

Vehicle 263

Cyclist 457

Ped 370

Alarm 0

0 DATA

91 DATA

56 DATA

Vehicle Image

09:57:45

09:57:47

09:57:45

09:57:45

09:57:44

09:57:46

09:57:42

09:57:46

09:57:41

09:57:46

09:57:40

09:57:44

2015-06-28 08:56:28 鄂岭大道与合盛市场

Black Car Cyclist

Cyclist Adult Trousers

Gray Van Trousers

Female Adult ShortSleeve

Male Adult ShortSleeve Trousers

White Small truck

Blue Car

Blue SUV

Gray Small truck

Black Cyclist

Cyclist

Adult ShortSleeve

Male Adult ShortSleeve Shorts

Male Adult ShortSleeve Trousers

Pedestrian

09:57:48

09:57:48

09:57:48

09:57:48

09:57:47

09:57:47

09:57:47

SENSETIME | 商湯科技

Gerd



**It could be heaven..... or it could be hell**





It could be heaven.... or it could be hell





# Gartner picks digital ethics and privacy as a strategic trend for 2019



6 days ago



Analyst **Gartner**, best known for crunching device marketshare data; charting technology hype cycles; and churning out predictive **listicles** of emergent capabilities at software's cutting edge has now put businesses on watch that as well as dabbling in the usual crop of nascent technologies organizations need to be thinking about wider impacts next year — on both individuals and society.





*The web was designed to bring people together and make knowledge freely available.  
Everyone has a role to play to ensure the web serves humanity. By committing to the  
following principles, governments, companies and citizens around the world can help  
protect the open web as a public good and a basic right for everyone.*

## GOVERNMENTS WILL

**Ensure everyone can connect to the internet** so that anyone, no matter who they are or where they live, can participate actively online.

**Keep all of the internet available, all of the time** so that no one is denied their right to full internet access.

**Respect people's fundamental right to privacy** so everyone can use the internet freely, safely and without fear.

## COMPANIES WILL

**Make the internet affordable and accessible to everyone** so that no one is excluded from using and shaping the web.

**Respect consumers' privacy and personal data** so people are in control of their lives online.

**Develop technologies that support the best in humanity and challenge the worst** so the web really is a public good that puts people first.

## CITIZENS WILL

**Be creators and collaborators on the web** so the web has rich and relevant content for everyone.

**Build strong communities that respect civil discourse and human dignity** so that everyone feels safe and welcome online.

**Fight for the web** so the web remains open and a global public resource for people everywhere, now and in the future.

# ..... or it could be hell









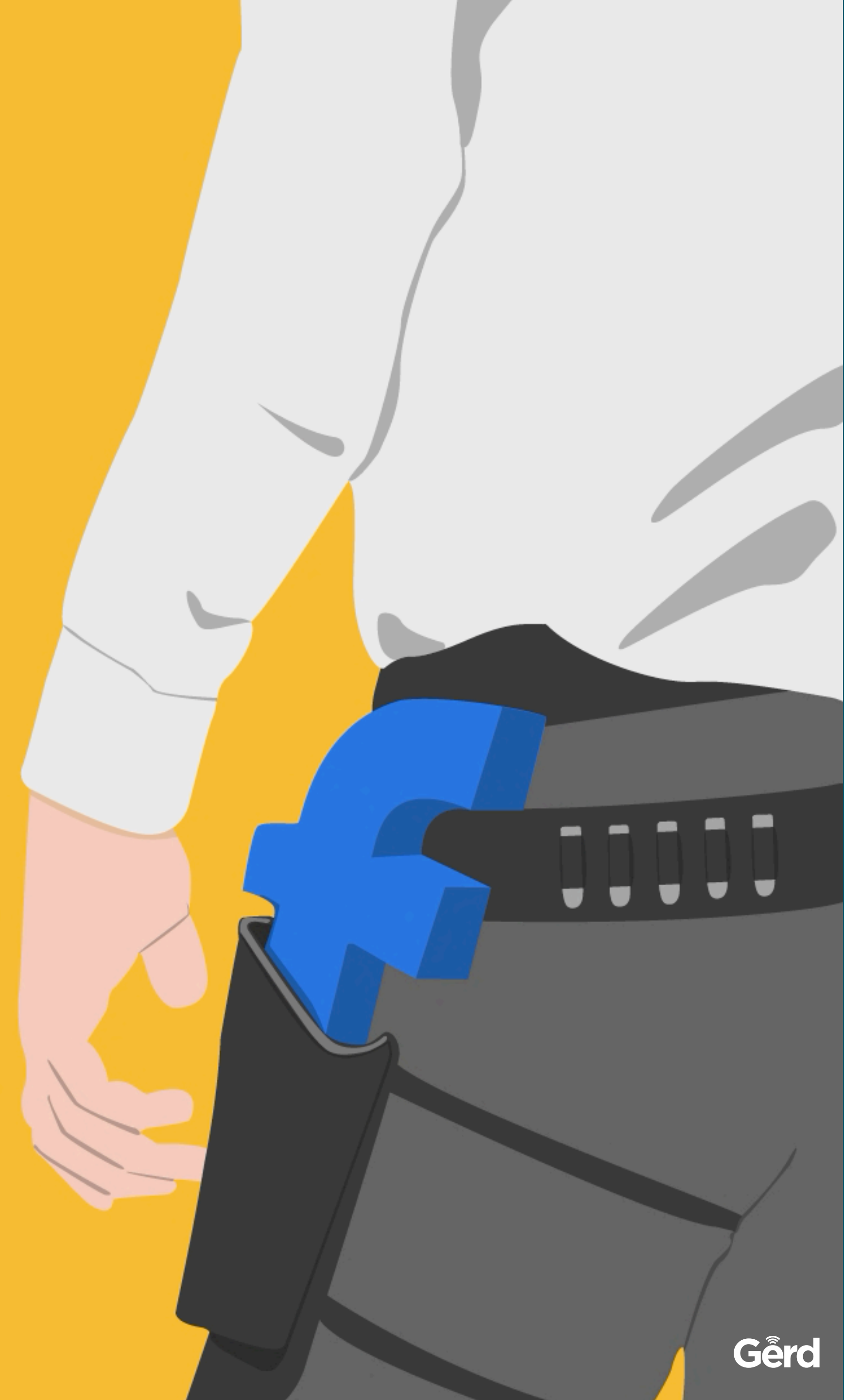
**"Ethics is knowing the difference between what you have a right (or the power) to do and what is the right thing to do"**

adapted from Potter Stewart

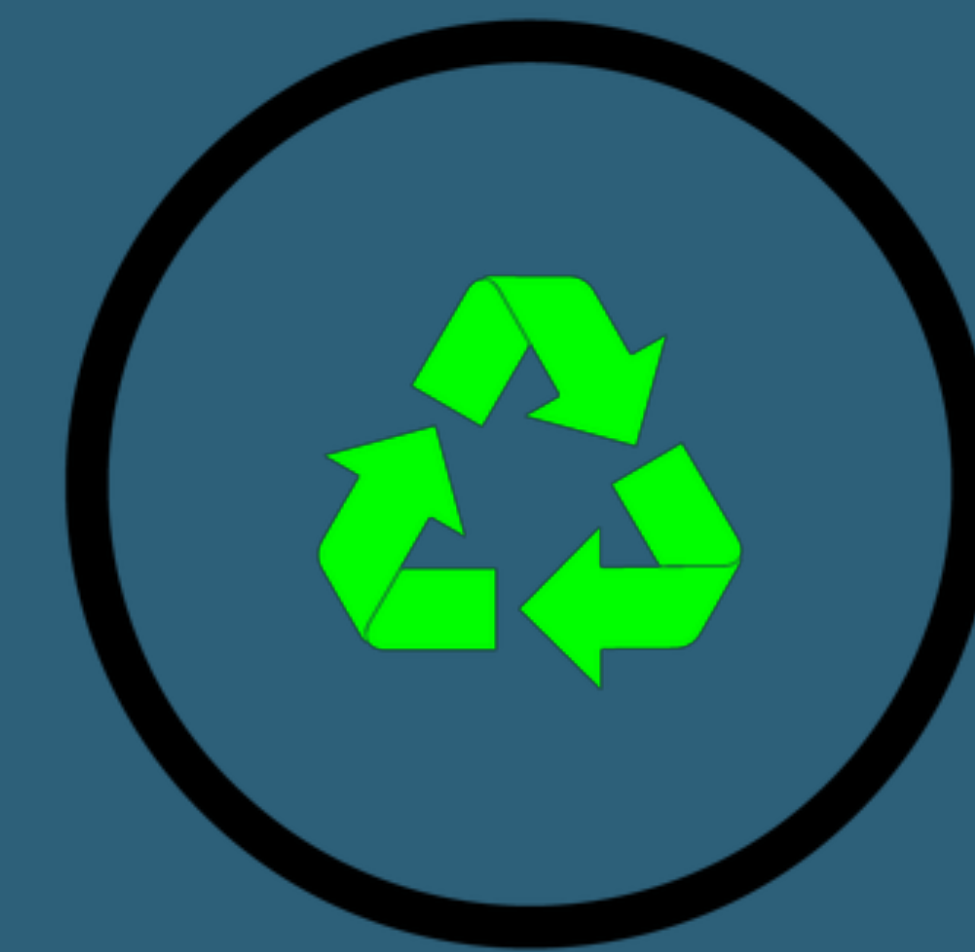


**TECHNOLOGY HAS NO ETHICS**







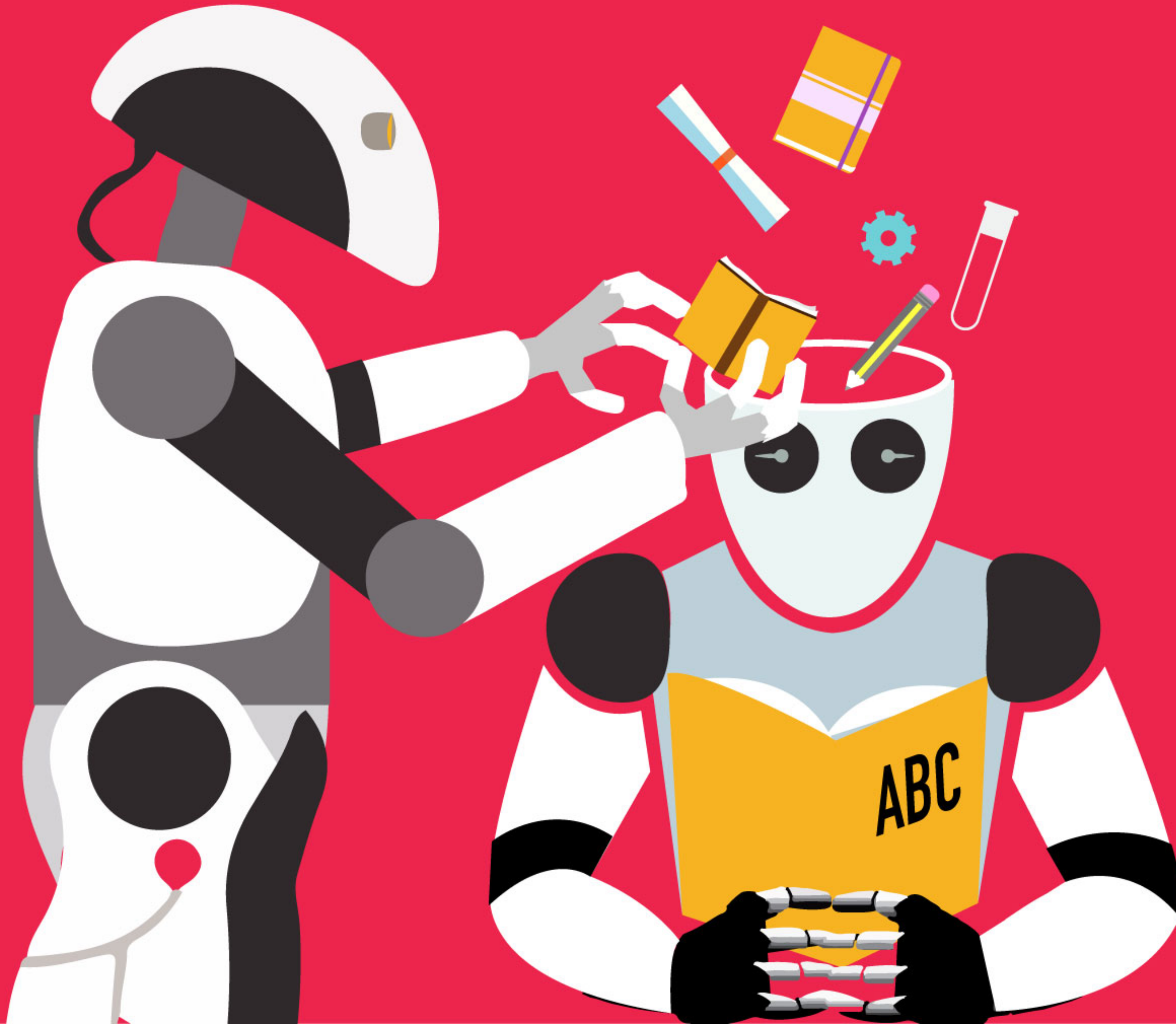




# Not really \*







**Data and  
Information ≠  
Knowledge ≠  
Understanding ≠  
Wisdom**



# Commerce is driven by data; MEANING is created by humans!

**Algorithms**

**“When it comes to really  
important decisions  
data trumps intuition  
every time”**

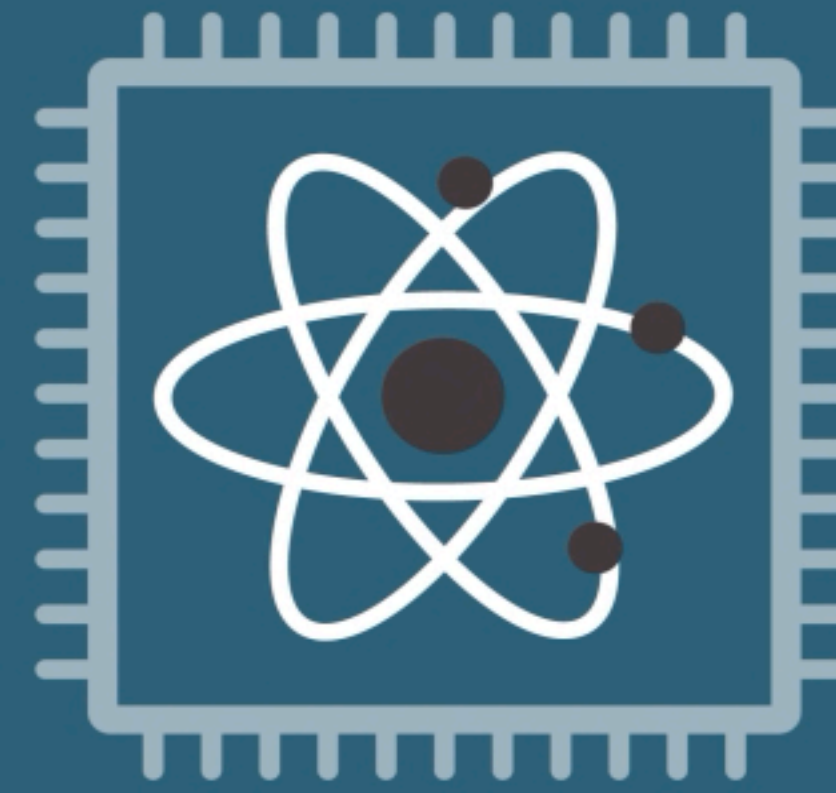
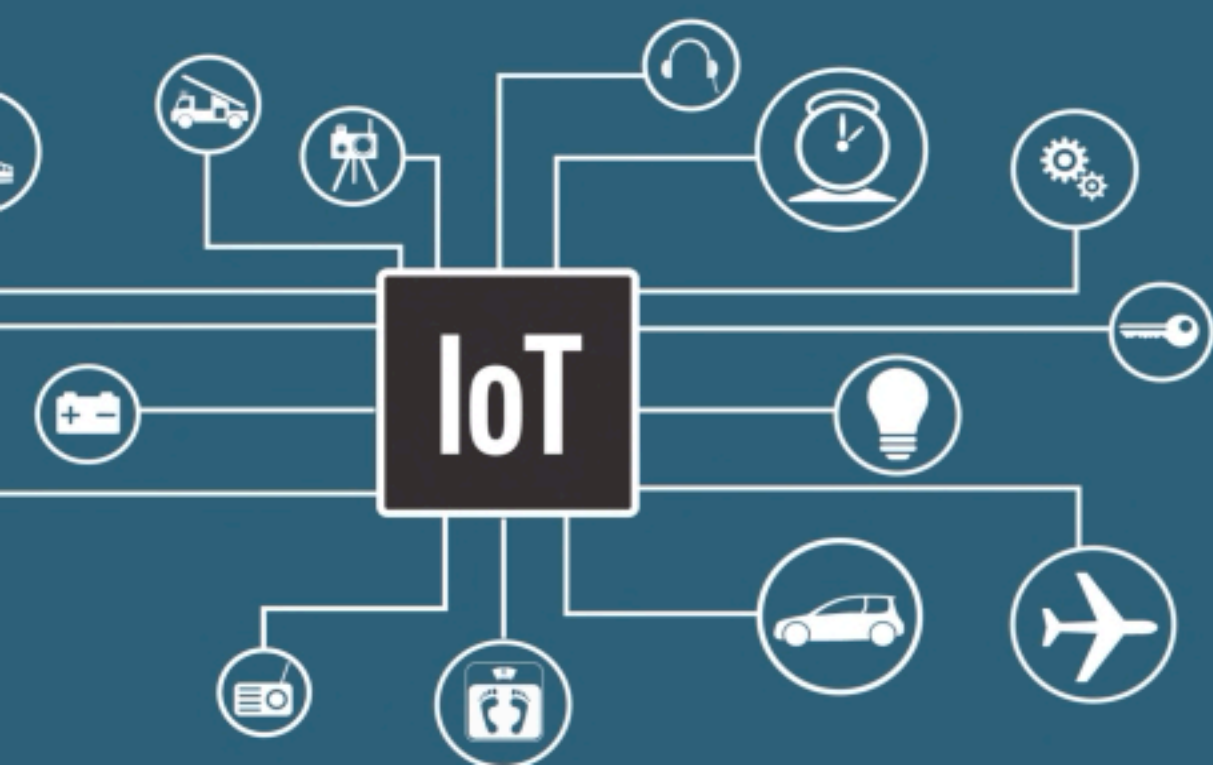
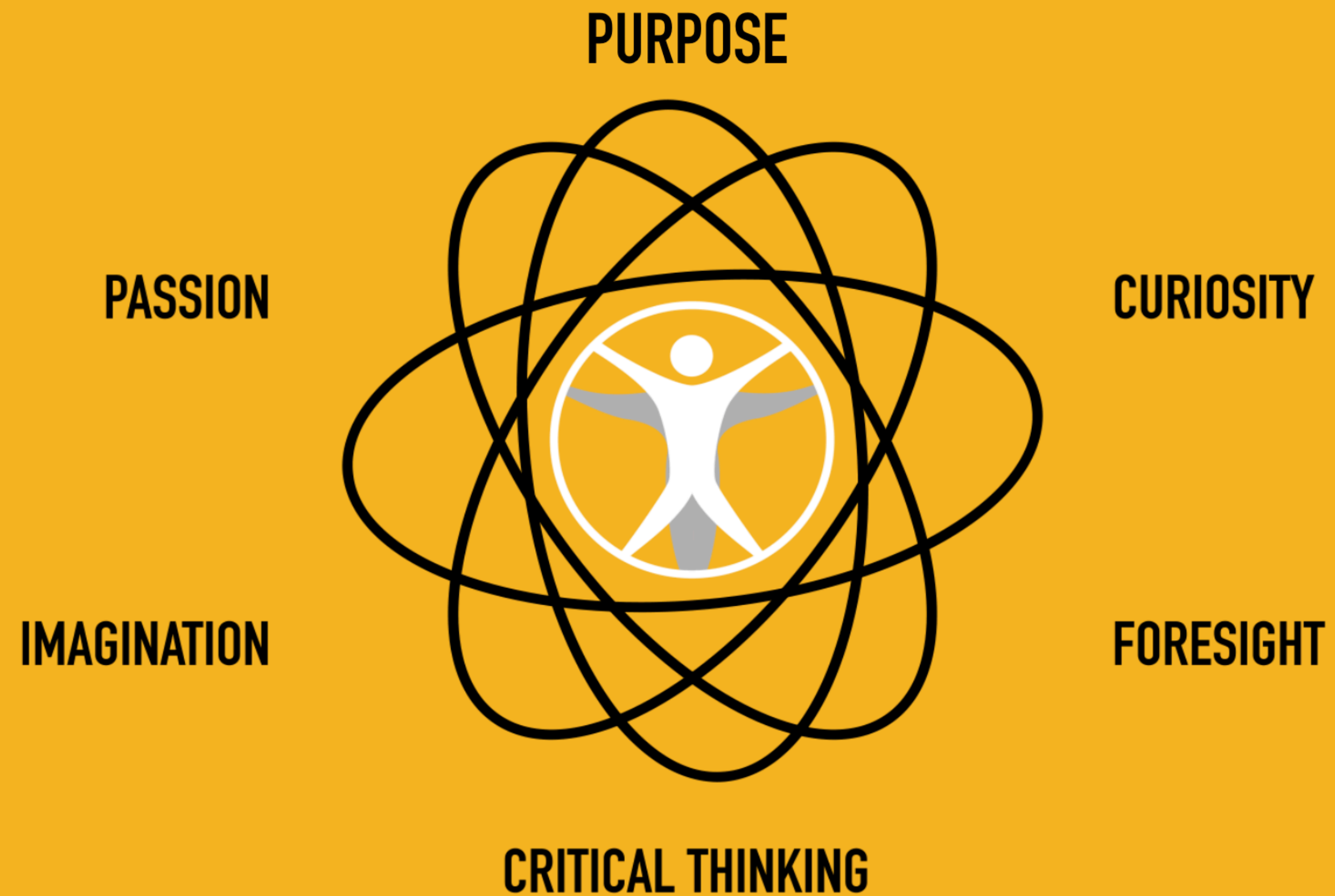
**Androrithms**

**“All of my best  
decisions in  
business and life  
have been made  
with heart, intuition,  
guts... not  
analysis”**



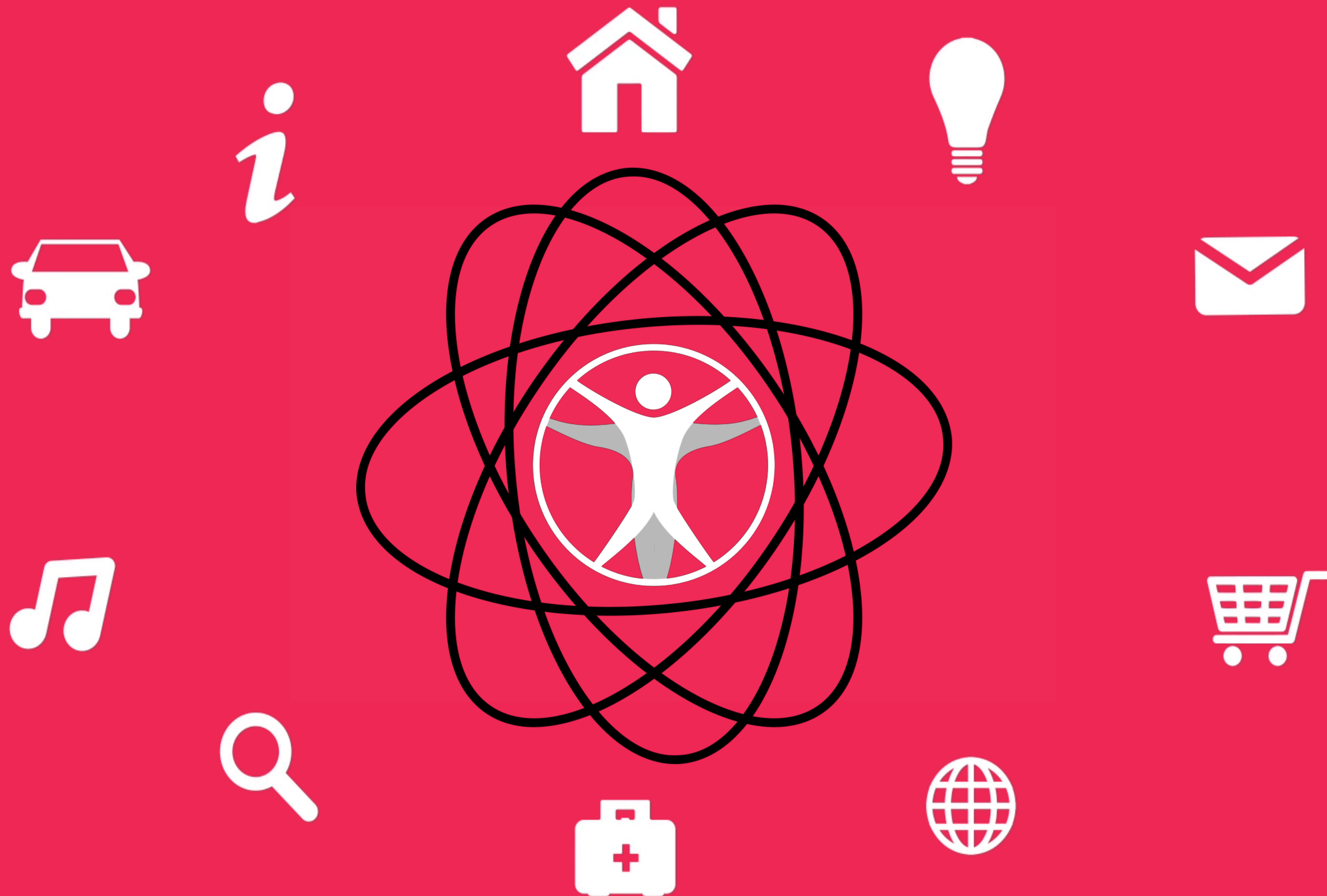


# The Future: awesome humans on-top of amazing technology





As the world goes digital it will be your **HUMANITY** that differentiates you





# Embrace technology but don't become it!





# THANK YOU FOR YOUR TIME



techvshuman.com



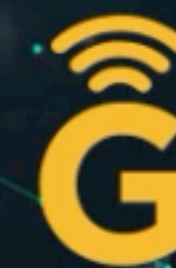
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@gleonhard



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1. Technology
2. Information theory approach
3. Analogous input
4. As an information and complexity
5. As an assurance which underlies the transformation
6. As an opportunity in technology
7. The application of information theory
8. Technologically relevant information
9. As a record
10. Examples
11. Details
12. References
13. Further readings
14. Of useful links

Information is that which informs. In other words, it is that which is a question of some kind. It is that which is related to data and knowledge, as data represents values attributed to parameters, and knowledge signifies understanding of real things or abstract concepts.[1] As it requires data, the information's existence is not necessarily coupled to an observer (event horizon for example), while in the case of knowledge, the information requires a cognitive observer.[2]

At its most fundamental level, information is any propagation of cause and effect within a system.[3] Information is conveyed either as the content of a message or through a representation of a message in its own right, and in that sense, information is always conveyed as the content of a message.