



# Technology Making Waves

The impact of digital technology on work, life, and everything

# Many Waves together make a Perfect Storm



Enhanced  
Workforce



Smart  
Environment



Embedded  
Internet



Artificial  
Intelligence



Digital  
Platforms

This is NOT science fiction





# Enhanced Workforce



**The Day Begins**  
The AGVs receive their instructions and get to work.





# World's First 3D-Printed Concrete Housing Project to be Built in Eindhoven

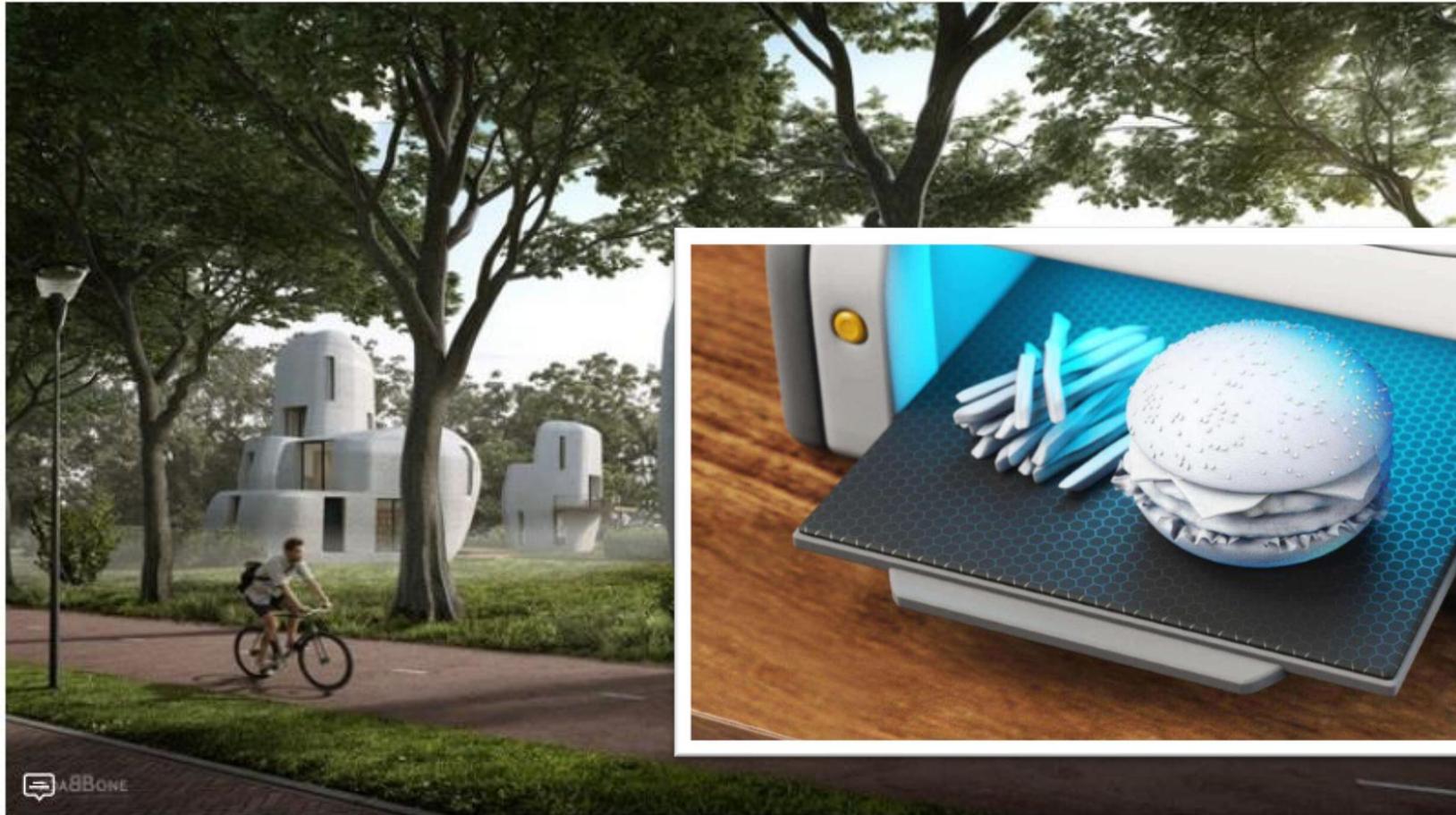
12:00 - 1 June, 2018 | by [Niall Patrick Walsh](#)

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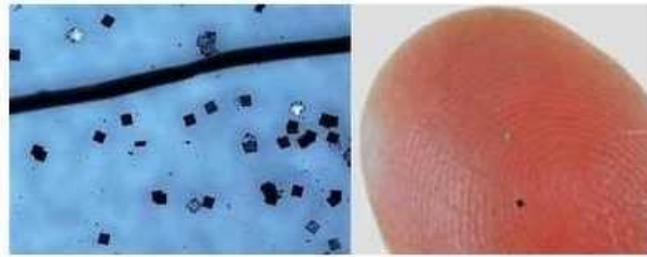
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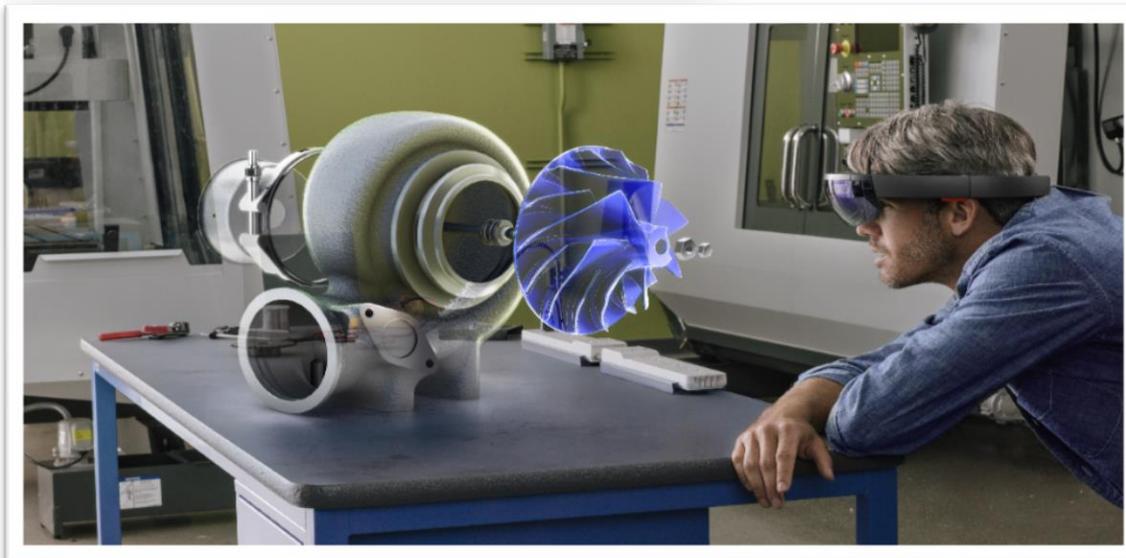
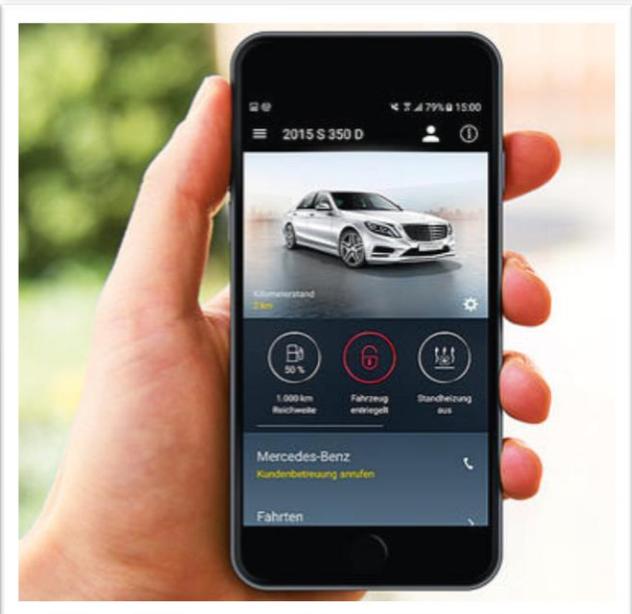
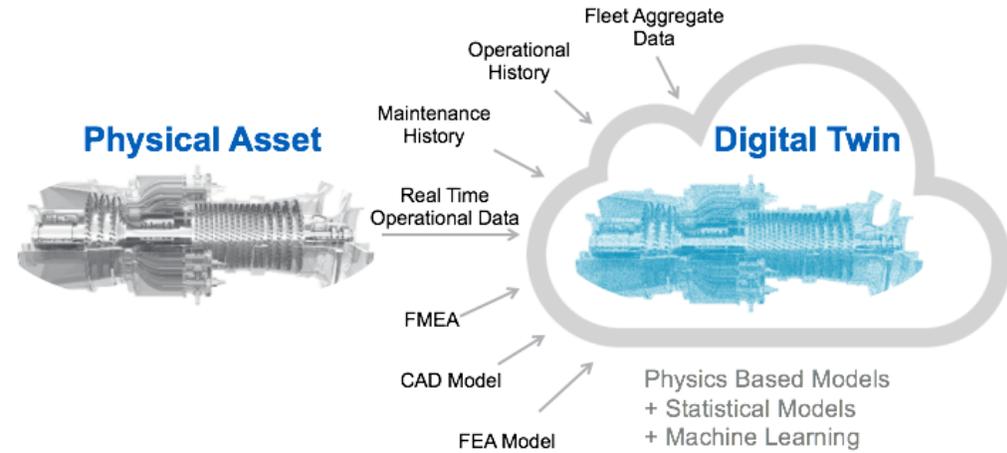




# Smart Environment



"These are made by Hitachi. They measure only .15X.15 mm each and have GPS capabilities! Sometimes called 'smartdust' as they can be sprayed on us and absorbed or taken in foods, drinks and even injected."

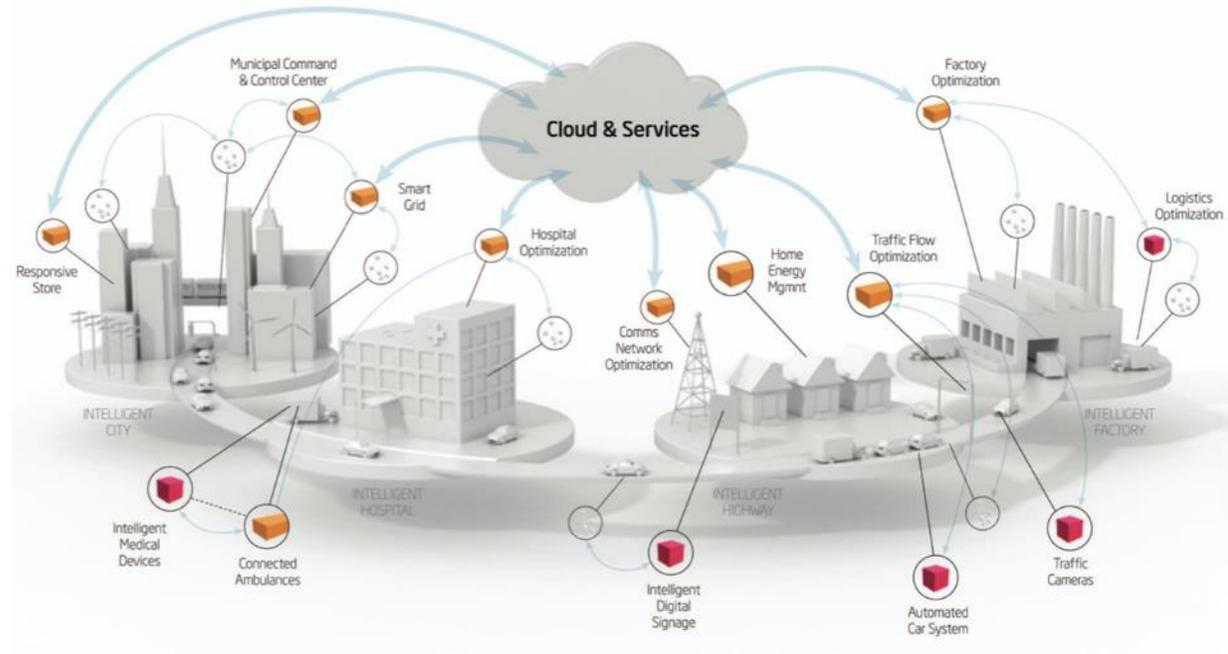




# Embedded Internet



Today... into your family

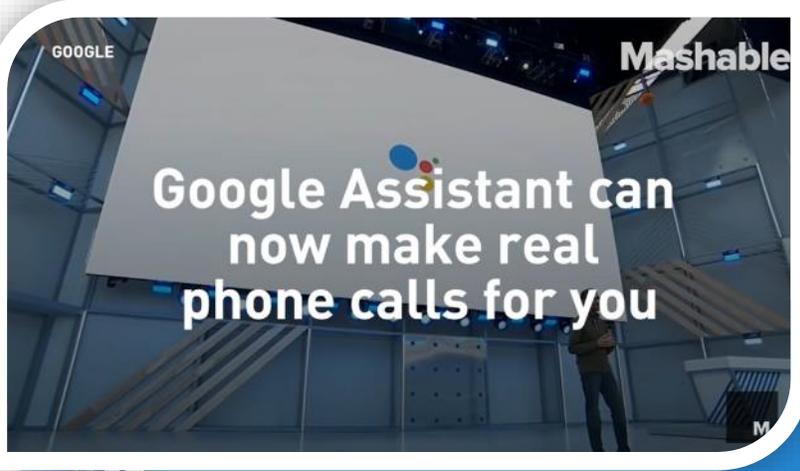
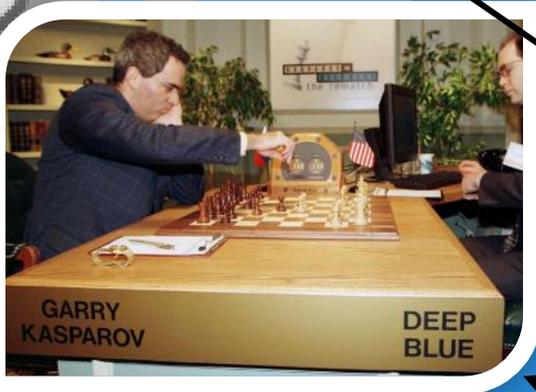


Tomorrow... everywhere you look



# Artificial Intelligence

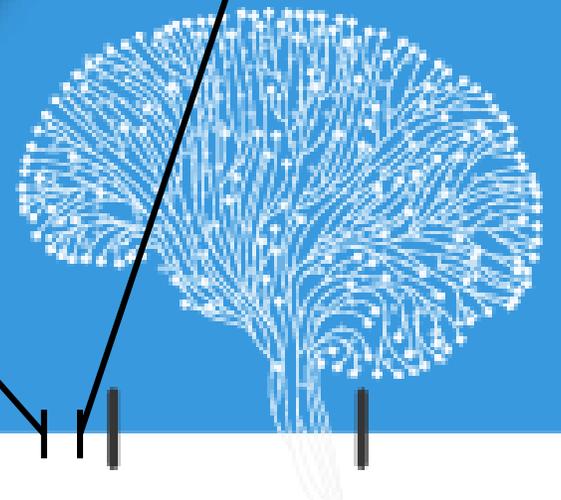
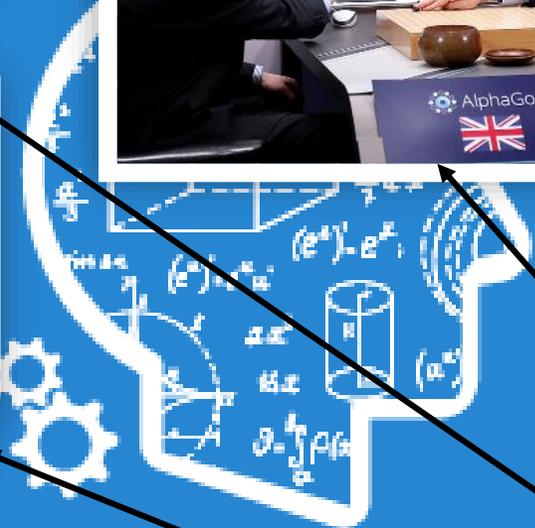
Early artificial intelligence stirs excitement.



## MACHINE LEARNING

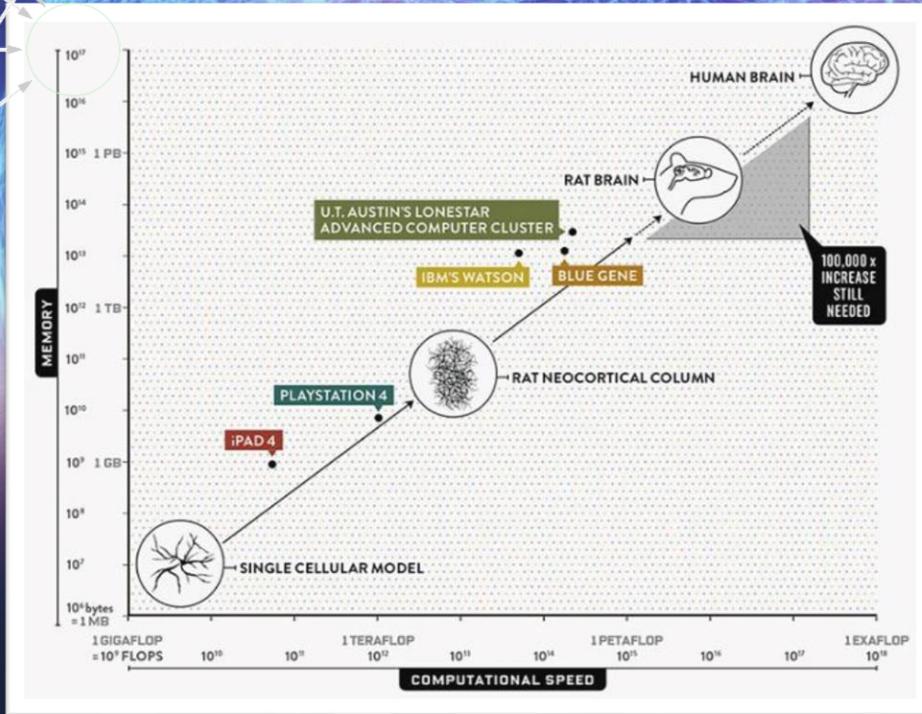
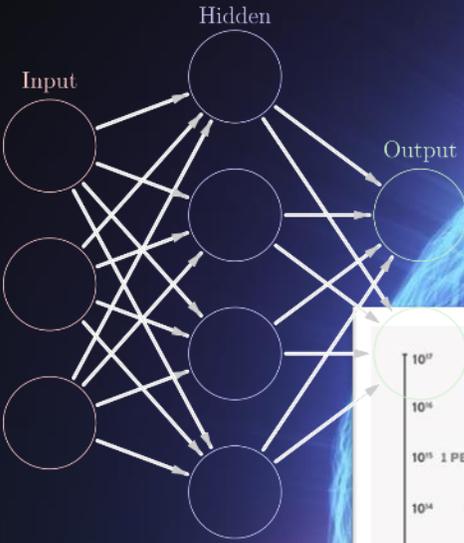
## DEEP LEARNING

Deep learning breakthroughs fuel AI boom.





# Artificial Intelligence



The Internet of Things will generate a staggering 400 zettabytes (ZB) of data a year by 2018. A zettabyte is a trillion gigabytes.

Extreme learning power

Fed by extreme amounts of data



cognitive music

# A collaboration by Alex Da Kid + IBM Watson



Watch the story (3:18)





# Digital Platforms: disrupt





Digital Platforms: transform



NIKE : FROM A SHOES  
MANUFACTURER TO A SPORTS  
COACH



## Empowering Knowledge

Elsevier is a global information analytics business that helps institutions and professionals advance healthcare, open science and improve performance for the benefit of humanity

for the benefit of humanity

healthcare, open science and improve performance

# Digital Platforms Mastery

Create New Merchandise



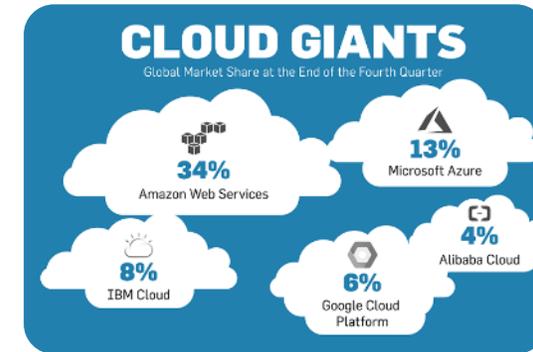
Sell Outside Merchandise

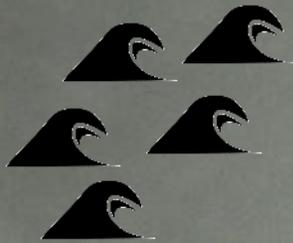


Stock & Ship Merchandise

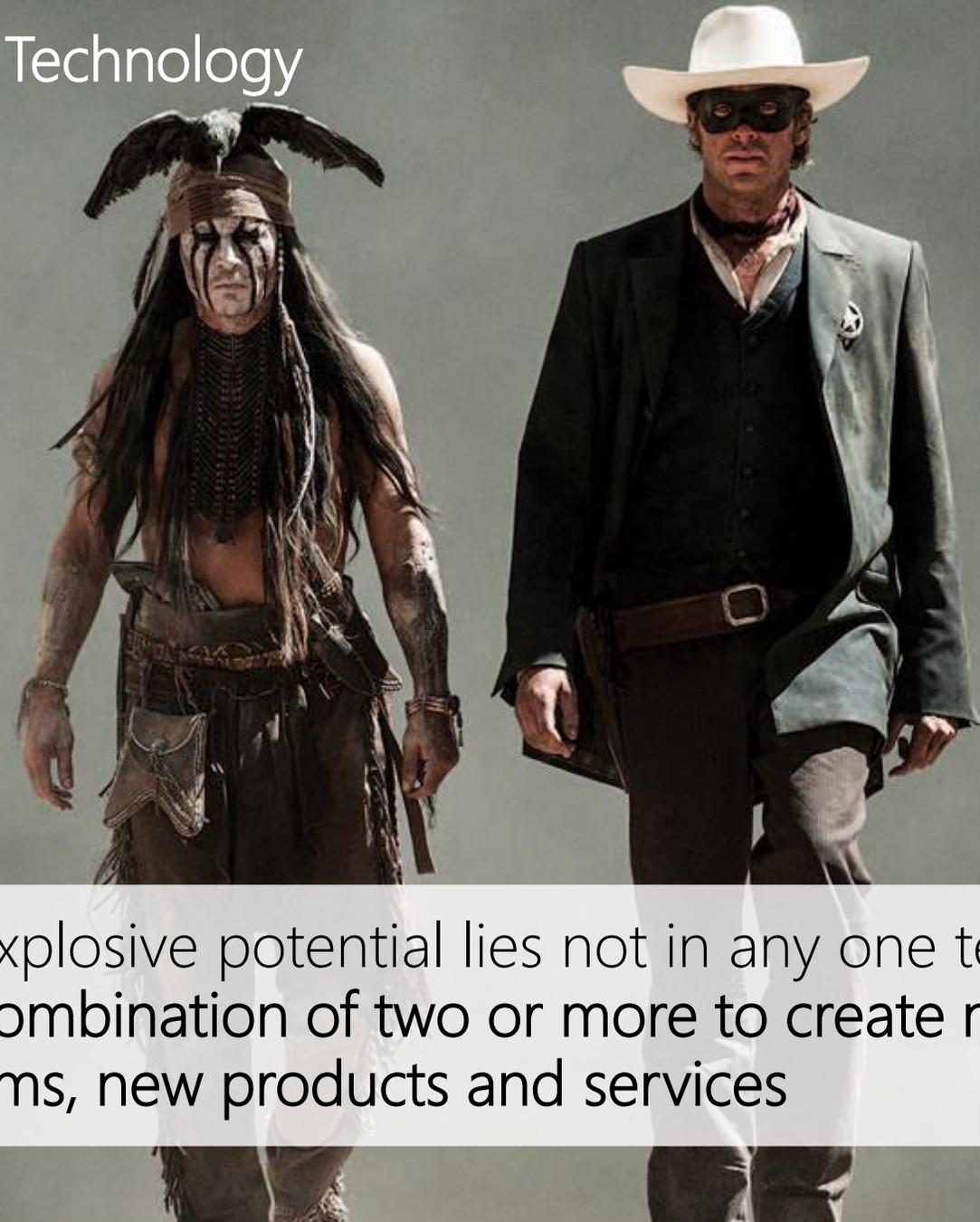


... and much, much more!



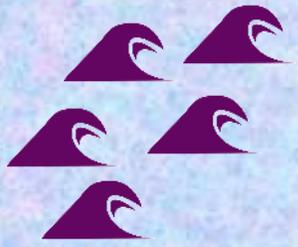


# Exponential Technology

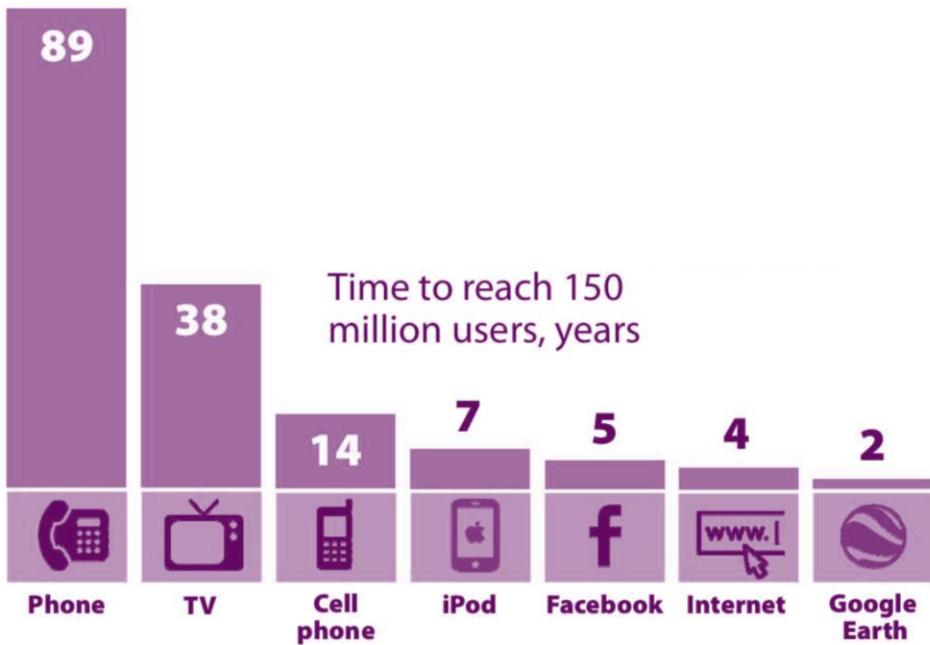


The really explosive potential lies not in any one technology alone, but in the combination of two or more to create new tools, new platforms, new products and services

Source: Forrester



# Exponential *Adoption* of Technology



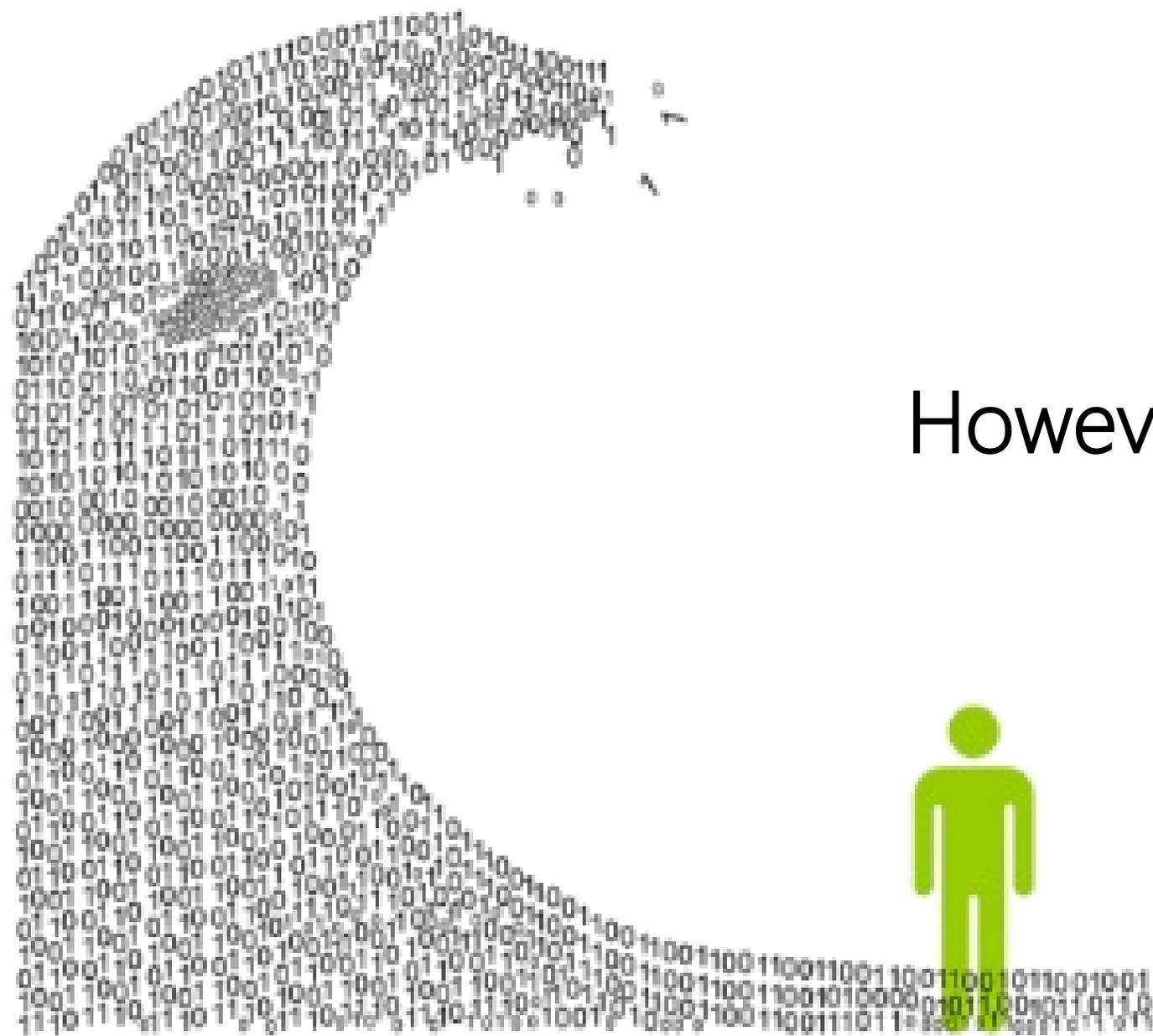
Source: The Magazine Imaging Notes. See also Ray Kurzweil's book The Singularity is Near and The Economist

'We always overestimate the change that will occur in the next two years, and underestimate the change that will occur in the next ten.'

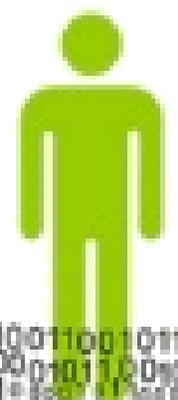
Don't let yourself be lulled into inaction.'

- Bill Gates -





However



3,421,899 views | Feb 16, 2012, 11:02am

# How Target Figured Out A Teen Girl Was Pregnant Before Her Father Did



**Kashmir Hill** Forbes Staff

*Welcome to The Not-So Private Parts where technology & privacy collide*



TARGET



# Big Data Knows When You're Going to Quit Your Job Before You Do

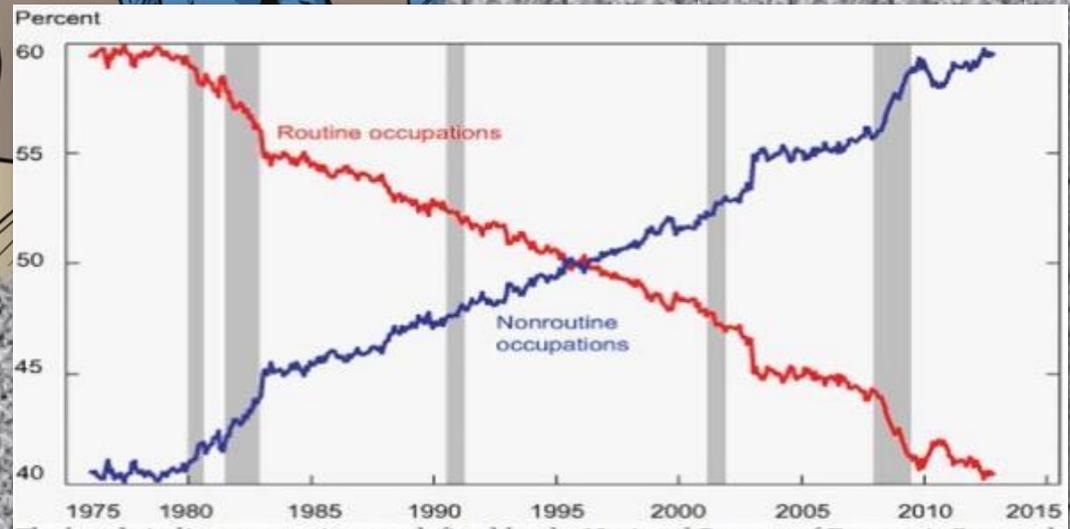
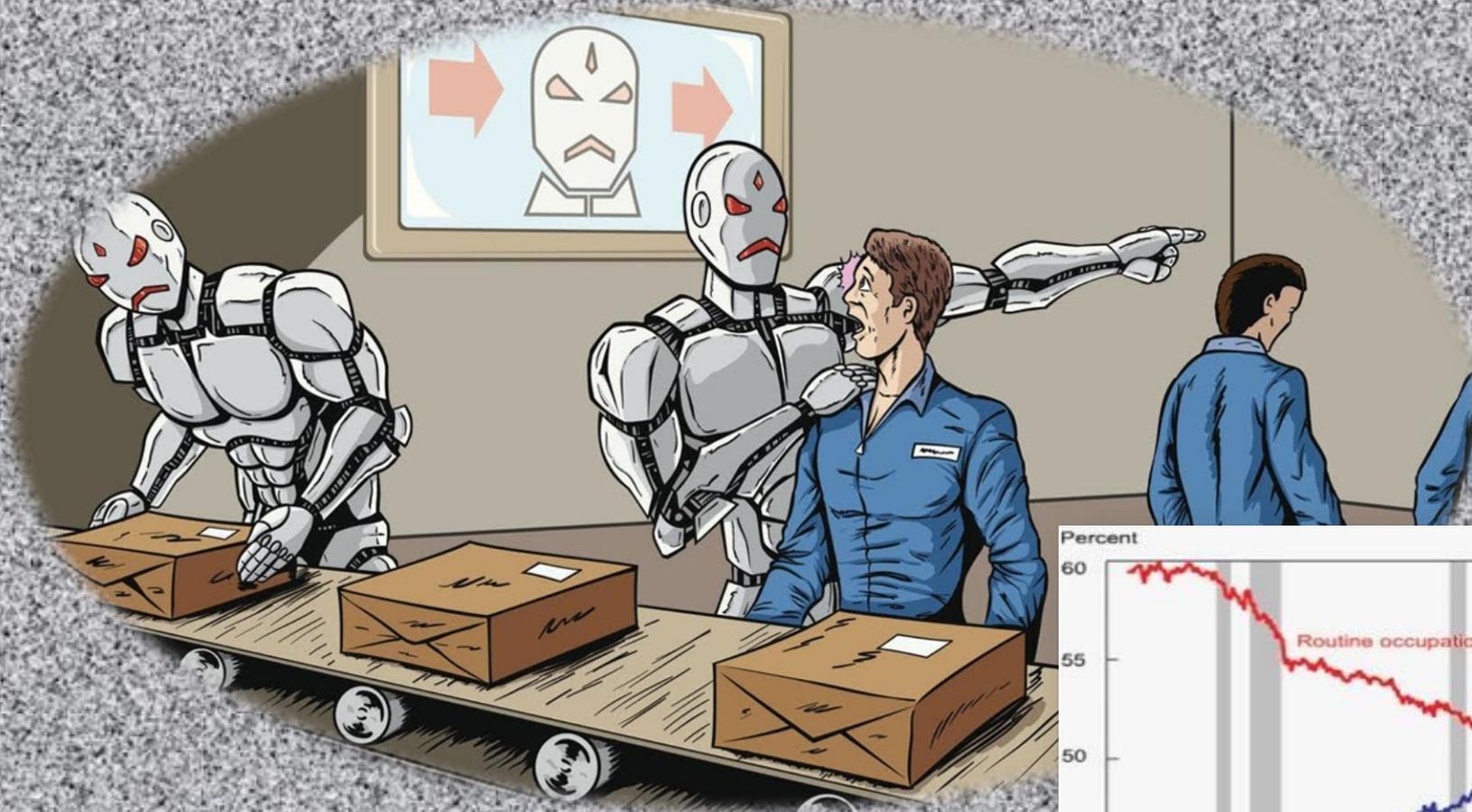
By Jack Clark | 2014-12-30T13:03:31Z | - [Comments](#) [Email](#) [Print](#)

Good bosses have an uncanny ability to sense when employees are unhappy and work with them to fix problems in the office before it's too late. At VMware in Silicon Valley, they let the machines figure it out.

Photographer: Simon Dawson/Bloomberg

*Employees at Standard Chartered Plc are seen working at the company's office in London.*

VMware has been testing a new prediction technology from Workday, which makes software for human resources departments. The system delivers notifications about when employees might be getting ready to quit, and



The bands indicate recessions as defined by the National Bureau of Economic Research.

Source: Adapted from U.S. Census Bureau, Current Population Survey

# What is neural lace?

Neural lace could be the answer to debilitating neurological disorders, and if Elon Musk has his way, the next step in human and computer advancement



By [Christina Mercer](#) | Sep 14, 2017

Share



Neural lace made headlines this year with Elon Musk launching Neuralink, a medical research company that aims to merge the human brain with intelligent computers.

And while this sounds like it's pulled from the pages of a Sci-Fi novel, neural lace could be the next advancement in the field of AI.

Are you freaking out yet?



# The future is looking bright



## BRAVE NEW WORLD

Robots doing  
all the hard,  
tedious,  
reptitive work

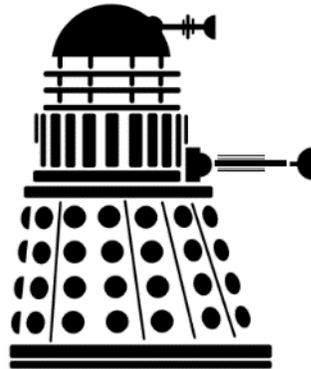
Artificial  
intelligence  
makes us smarter  
& healthier

Platforms provide  
us with all the  
services we will  
ever need

Whose technology makes the decisions and based on which principles?



How do we know that algorithms are acting on behalf of, rather than against, our interests?



How can we prevent that platform owners can change the conditions at their will.



We need to  
figure out how to  
make it RIGHT

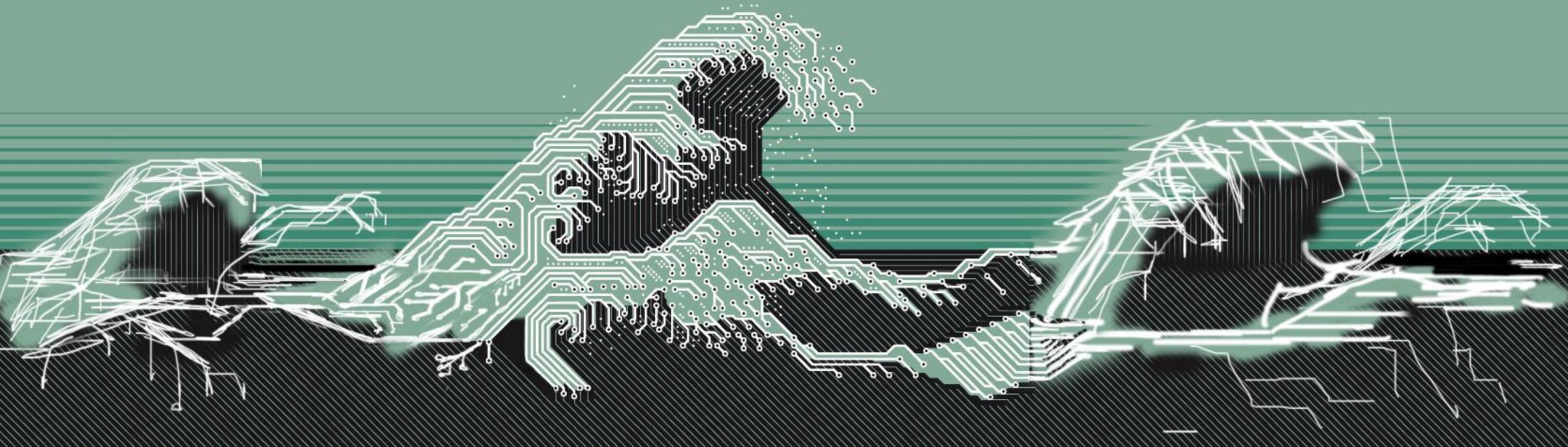


A blue-tinted image of the robot WALL-E from the movie "WALL-E". He is standing on a large pile of dark, crumpled trash. The background is a deep blue with small white stars, suggesting a night sky or a space-like environment. WALL-E is looking upwards and to the right.

There's no such thing  
as bad technology  
Only  
bad application  
of it

Thank you!

# APPENDICES





## Enhanced Workforce

- ▶ Factory Robots
- ▶ Autonomous Warehouse
- ▶ Self Driving Cars
- ▶ Drones
- ▶ Micro Drones
- ▶ Home use Robots
- ▶ Surgery Robots
- ▶ Nanotechnology
- ▶ Virtual Reality
- ▶ Augmented Reality
- ▶ Mixed Reality
- ▶ Wearables
- ▶ Injectables
- ▶ Google Glass
- ▶ Exoskeletons
- ▶ Implants
- ▶ 3D / 4D printing
- ▶ Self Replication



## Smart Environment

- ▶ Lora communication
- ▶ Micro Sensors
- ▶ Micro Actuators
- ▶ Real time Scada
- ▶ Smart Dust
- ▶ IT-OT integration
- ▶ I-Infrastructure
- ▶ Business fabric
- ▶ Digital Twins
- ▶ Smart Phone
- ▶ Smart Watch
- ▶ Smart Meter
- ▶ Smart Fridge
- ▶ Smart Grid
- ▶ Smart Home
- ▶ Smart Street Lighting
- ▶ Smart Roads
- ▶ Smart Building
- ▶ Smart Factory
- ▶ Smart City



## Artificial Intelligence

- ▶ Knowledge Management
- ▶ Business Rules Engines
- ▶ Data Mining
- ▶ Process Mining
- ▶ Big Data
- ▶ Neural Networks
- ▶ Artificial Intelligence
- ▶ Adaptive Algorithms
- ▶ Machine Learning
- ▶ Deep Learning
- ▶ RPA
- ▶ Speech recognition
- ▶ Image recognition
- ▶ NLanguage processing
- ▶ NLanguage generation
- ▶ Quantum Computing



## Embedded Internet

- ▶ Social Networks
- ▶ Social Messaging
- ▶ Internet of Things
- ▶ Cloud Computing
- ▶ Serverless Computing
- ▶ Edge Computing
- ▶ The Fog
- ▶ Cloudlets
- ▶ Neural lace
- ▶ Cortex control
- ▶ Brain enhancement
- ▶ Service Orientation
- ▶ Software as a Service
- ▶ API Management
- ▶ Micro Services
- ▶ Docks & Containers

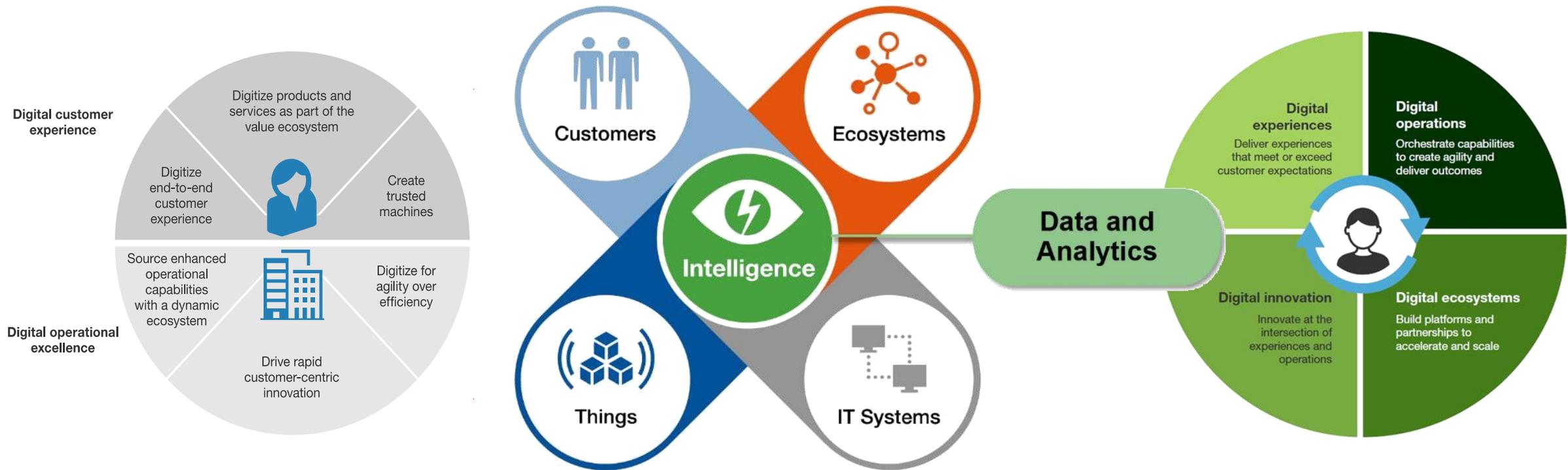


## Digital Platforms

- ▶ B2B
- ▶ Data Sharing
- ▶ Business communications
- ▶ Business Collaboration
- ▶ Enterprise Integration
- ▶ Integrated Supply Chain
- ▶ Distributed Ledger, Blockchain, Smart Contracts
- ▶ B2B, P2P
- ▶ Webshops
- ▶ Home delivery
- ▶ Payment platforms
- ▶ Social lending
- ▶ Assetless sharing

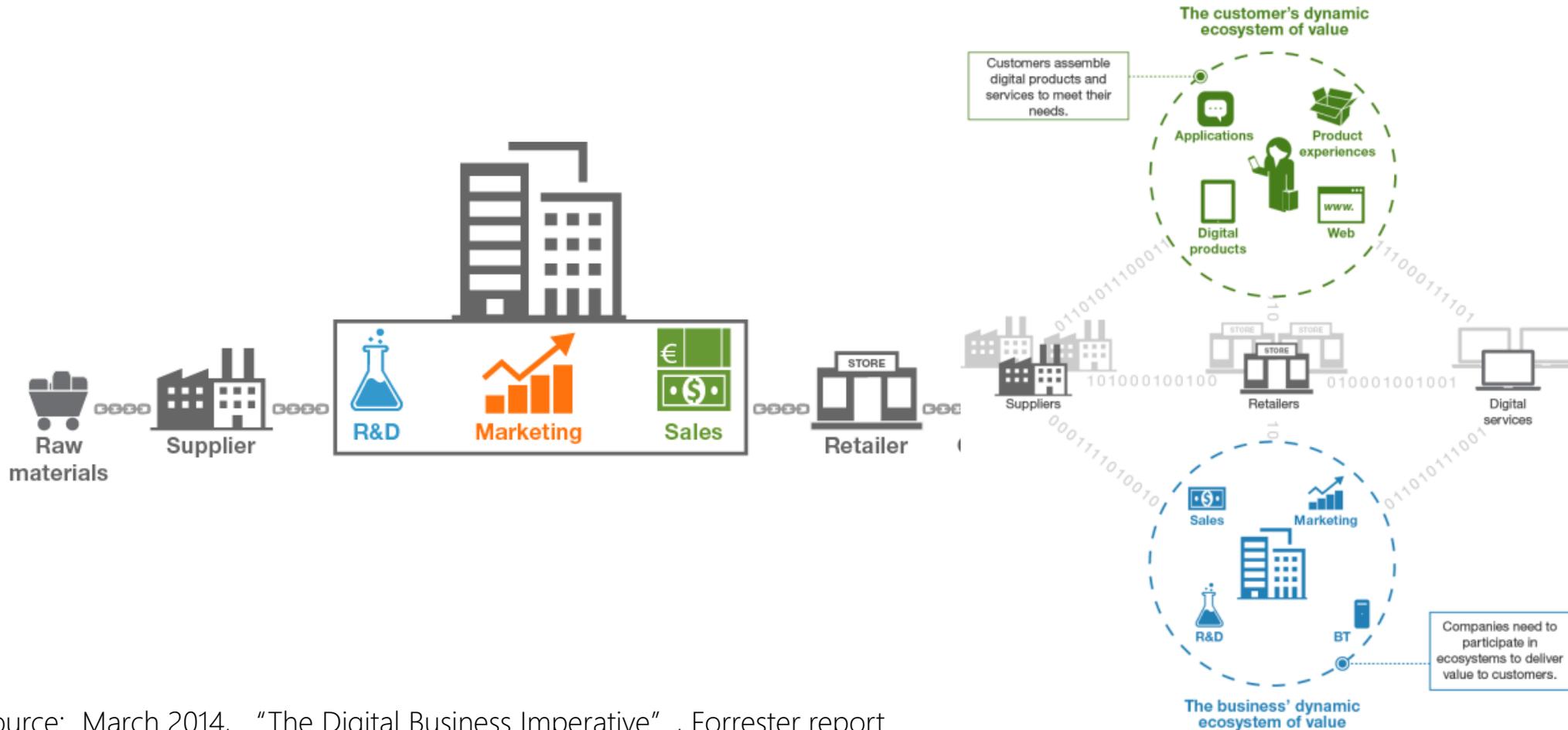
# Technology Waves Transform Businesses

New technology has the power to transform the way we do business



# Technology Waves Transform whole Ecosystems of Businesses

New technology has the power to transform the way we do business



Source: March 2014, "The Digital Business Imperative", Forrester report

# New organization structures

Source: Forrester



Org model	Who's using it?	What it is
Holacracy	Zappos	Holacracy is a system of flat organizational governance trademarked by HolacracyOne. It distributes authority and decision making to self-organizing teams called circles.
Teal	Patagonia	Teal is an operating model for self-organizing, purpose-driven organizations. Leadership is distributed. Roles are fluid and self-selected.
Scaling Agile	Spotify	Scaling Agile is an evolution of matrix management and the emerging scaling Agile framework. Squads, tribes, chapters, and guilds provide functional, business, and career development alignment depending on employees' needs.
Teaming	GE Aviation	Autonomous manufacturing teams manage tasks like workforce scheduling, process optimization, and production planning. Councils containing team reps, along with management, HR, etc., make collective, plantwide decisions.
Individual autonomy	Valve Software	Employees are free to decide where they want to spend time. Self-directed "cabals" form to guide work. Regular, anonymous peer reviews feed employee evaluations.
Podularity	Rational Software	Business is decomposed into modules, or "pods." Modular teams, or pods, are small, autonomous units enabled and empowered to deliver the things that customers value.

# Democracy by Design principles



## Platform factor

Separate roles on a platform

Ensure others can connect to a platform

Stimulate that platforms are owned by their users

Decentralize Platforms

## Algorithm factor

Reduce the complexity in algorithms

Reduce the knowledge deficit

Require algorithms to be open

Audit algorithms

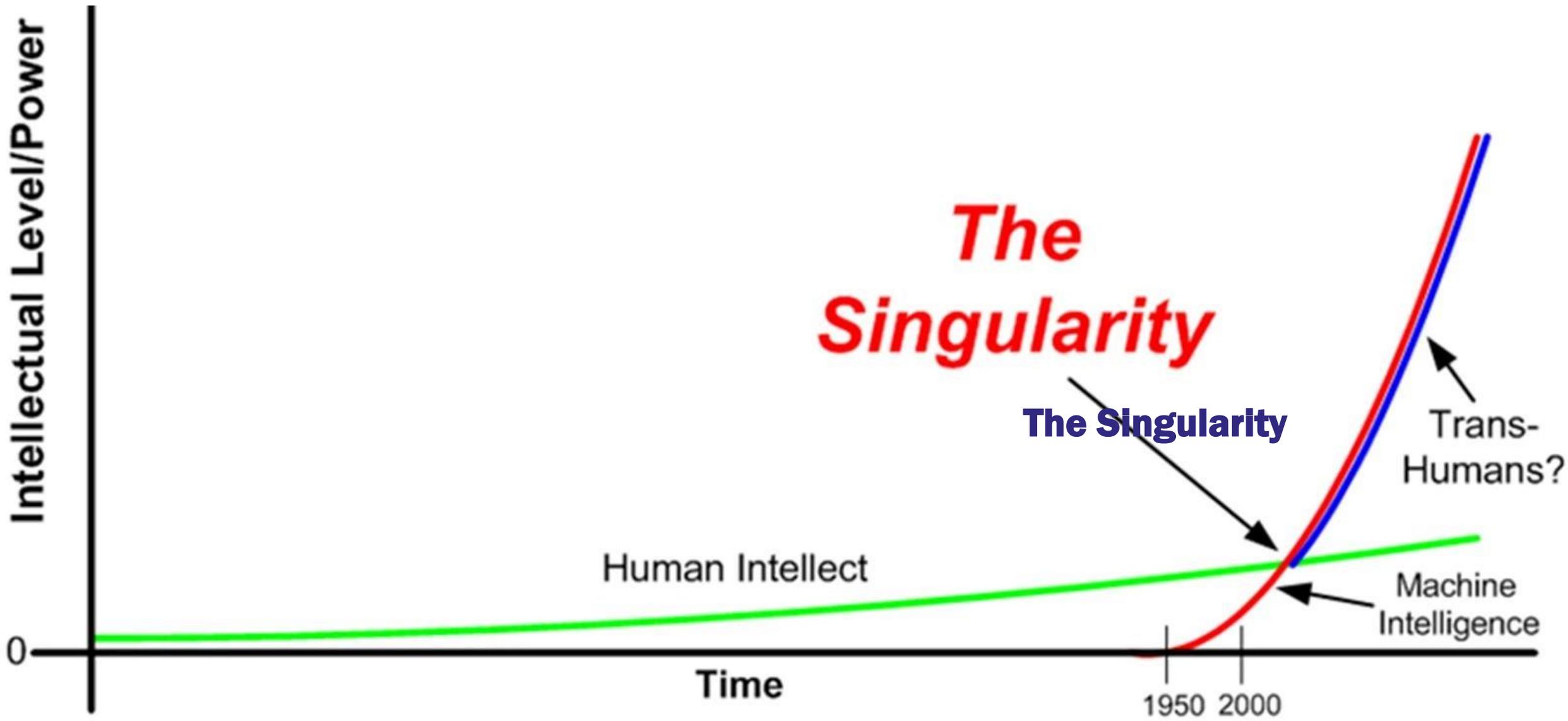
Be very selective when using predictive algorithms

## Data factor

Enforce intellectual property rights equally

Minimize data collection and maximize purpose specification

A Hippocratic oath for IT professionals



# *The Singularity*

**The Singularity**

Human Intellect

Time

1950 2000

Machine Intelligence

Trans-Humans?