

# How can AI change the risk landscape for businesses and their insurers?

Airmic 2019 – Monday 3 June (abridged)



# Agenda

What is AI

QBE's experience of Machine Learning

Looking to the future

Exponential growth in data

Insurance and risk landscape

# Victor Hu

## Head of Data Science

Airmic 2019 – Monday 3 June





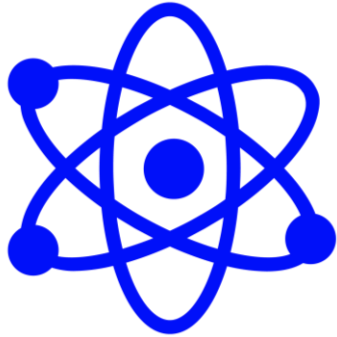
*Big data is like teenage sex: everyone talks about it, nobody really knows how to do it, everyone thinks everyone else is doing it, so everyone claims they are doing it...*



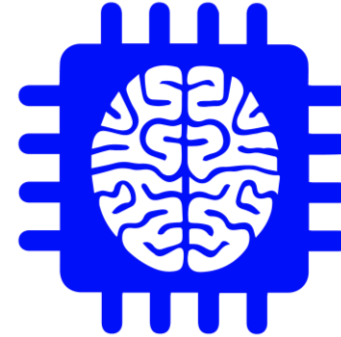
Dan Ariely, Duke University



# Moneyball



**Data Science**



**Machine Learning**



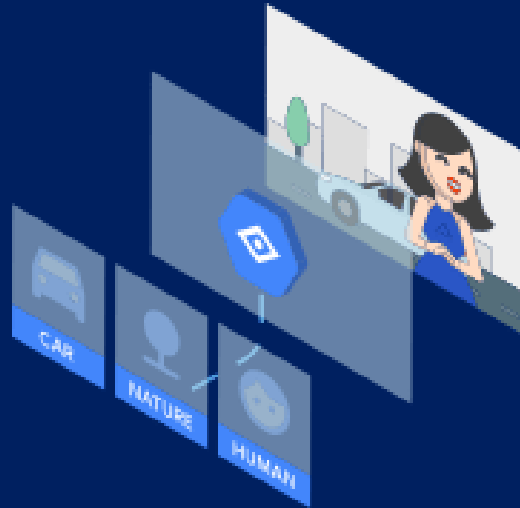
**NETFLIX**



**Google**

# Applications in everyday life

# An example of Machine Learning





# Machine Learning at QBE





**Liability Decision  
Making**





**Liability Decision  
Making**

Claims

Customer

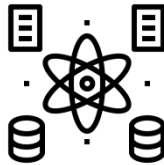
Product

Data Science  
at  
QBE

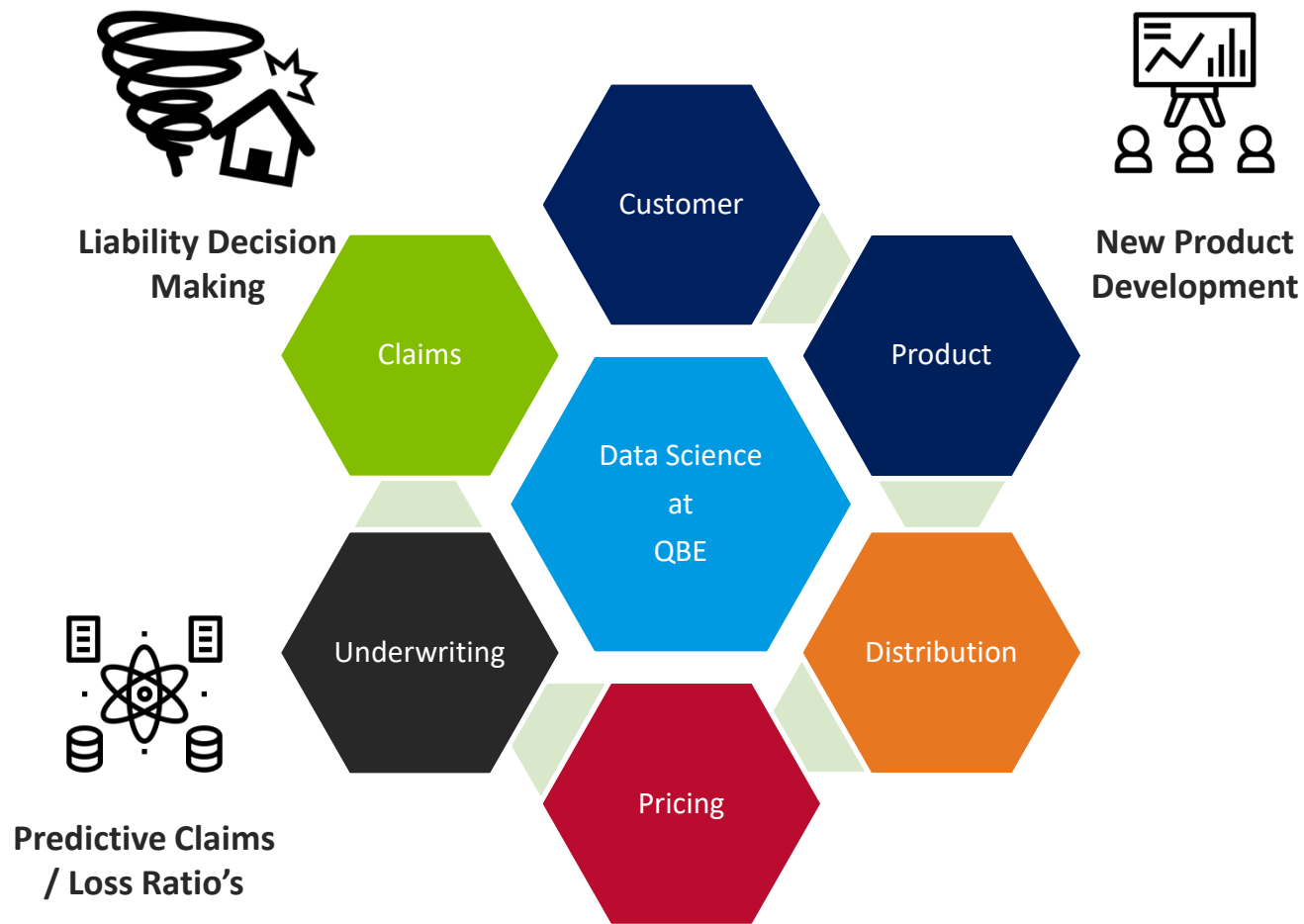
Distribution

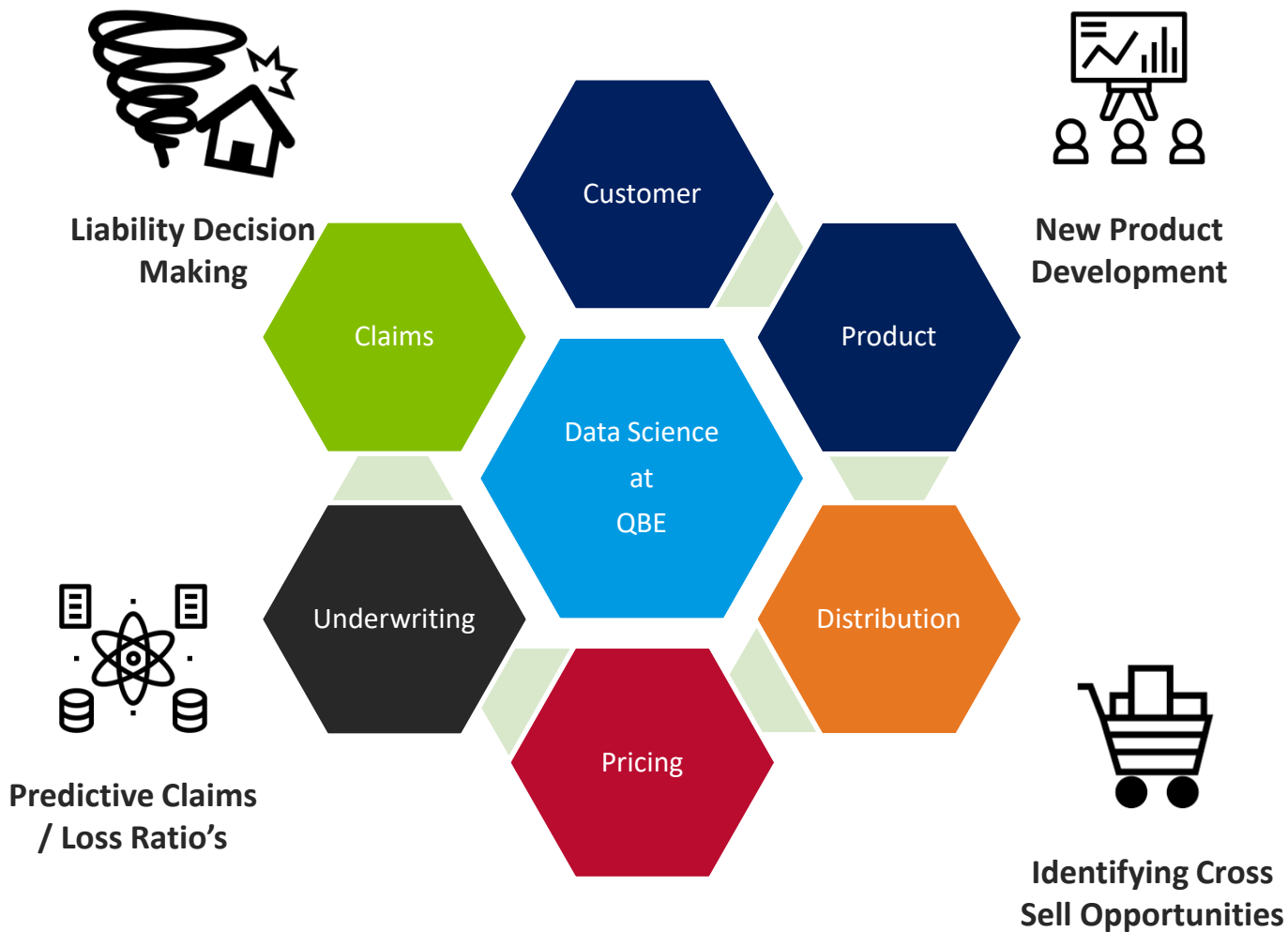
Pricing

Underwriting



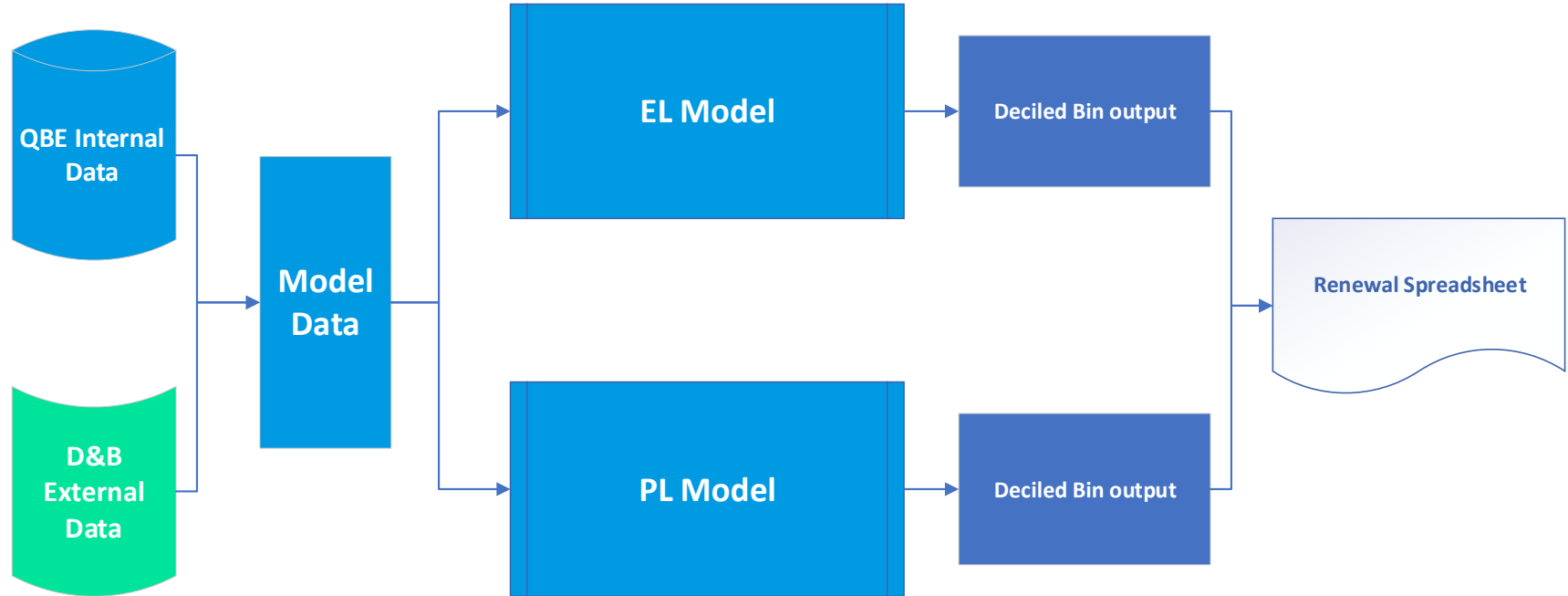
**Predictive Claims  
/ Loss Ratio's**





# Case Studies

# Risk Selection Case Study – UK Casualty





# Fraud Detection using Text – Named Entity Recognition



In 1917, Einstein applied the general theory of relativity to model the large-scale structure of the universe. He was visiting the United States when Adolf Hitler came to power in 1933 and did not go back to Germany, where he had been a professor at the Berlin Academy of Sciences. He settled in the U.S., becoming an American citizen in 1940. On the eve of World War II, he endorsed a letter to President Franklin D. Roosevelt alerting him to the potential development of "extremely powerful bombs of a new type" and recommending that the U.S. begin similar research. This eventually led to what would become the Manhattan Project. Einstein supported defending the Allied forces, but largely denounced using the new discovery of nuclear fission as a weapon. Later, with the British philosopher Bertrand Russell, Einstein signed the Russell-Einstein Manifesto, which highlighted the danger of nuclear weapons. Einstein was affiliated with the Institute for Advanced Study in Princeton, New Jersey, until his death in 1955.

Tag colours:

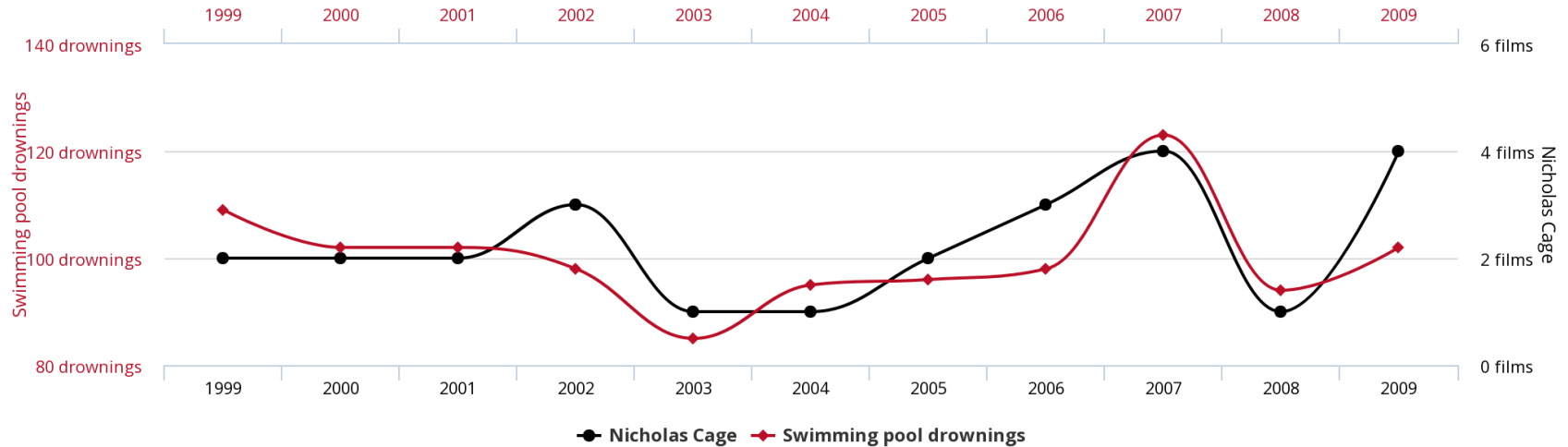
LOCATION TIME PERSON ORGANIZATION MONEY PERCENT DATE

# Dangers of AI

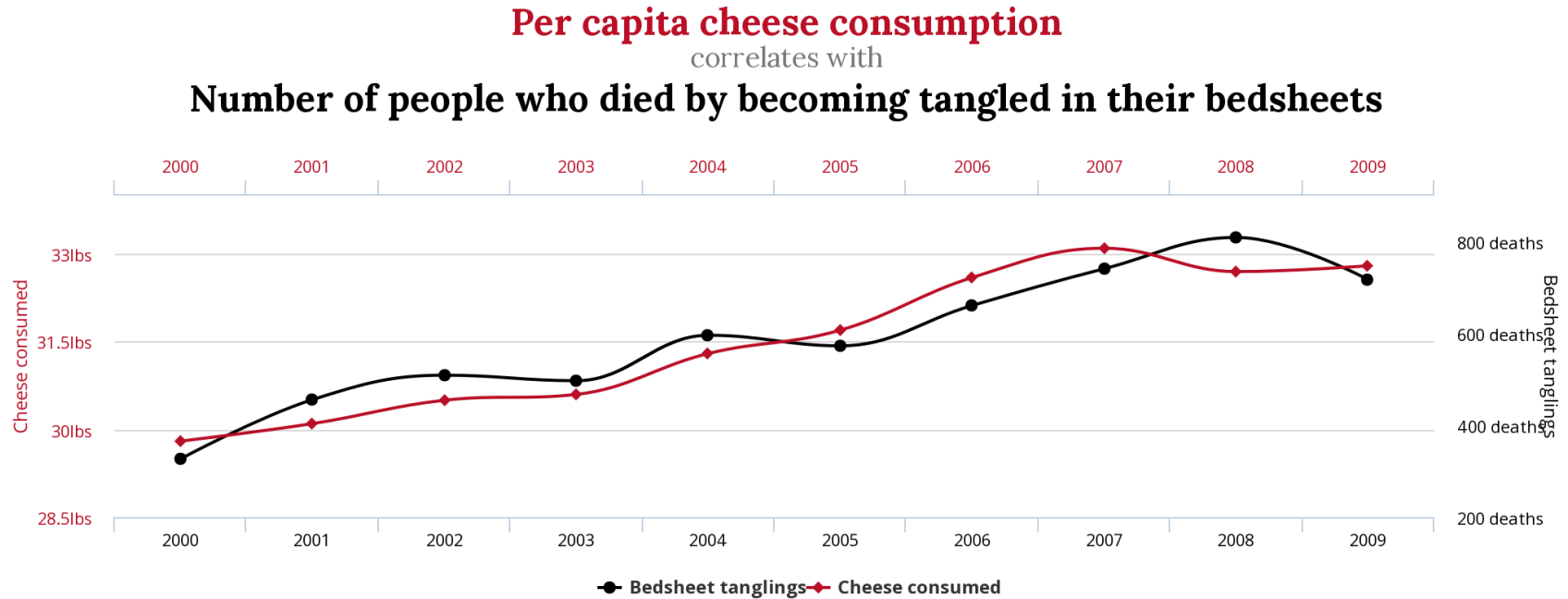
Spurious correlations  
Ethics



## Number of people who drowned by falling into a pool correlates with Films Nicolas Cage appeared in



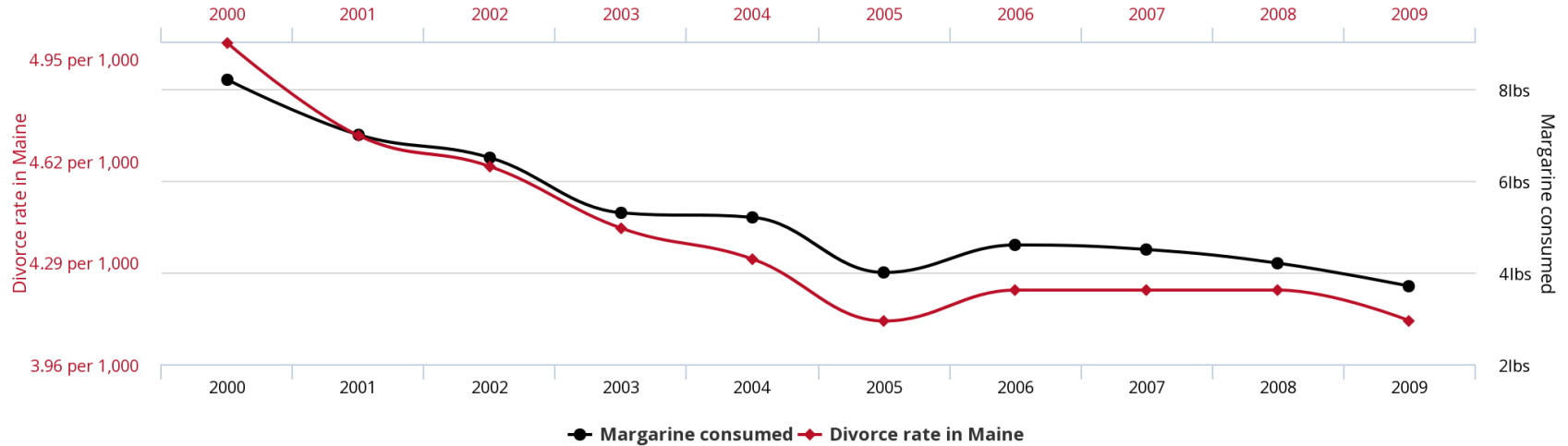
tylervigen.com



tylervigen.com



## Divorce rate in Maine correlates with Per capita consumption of margarine



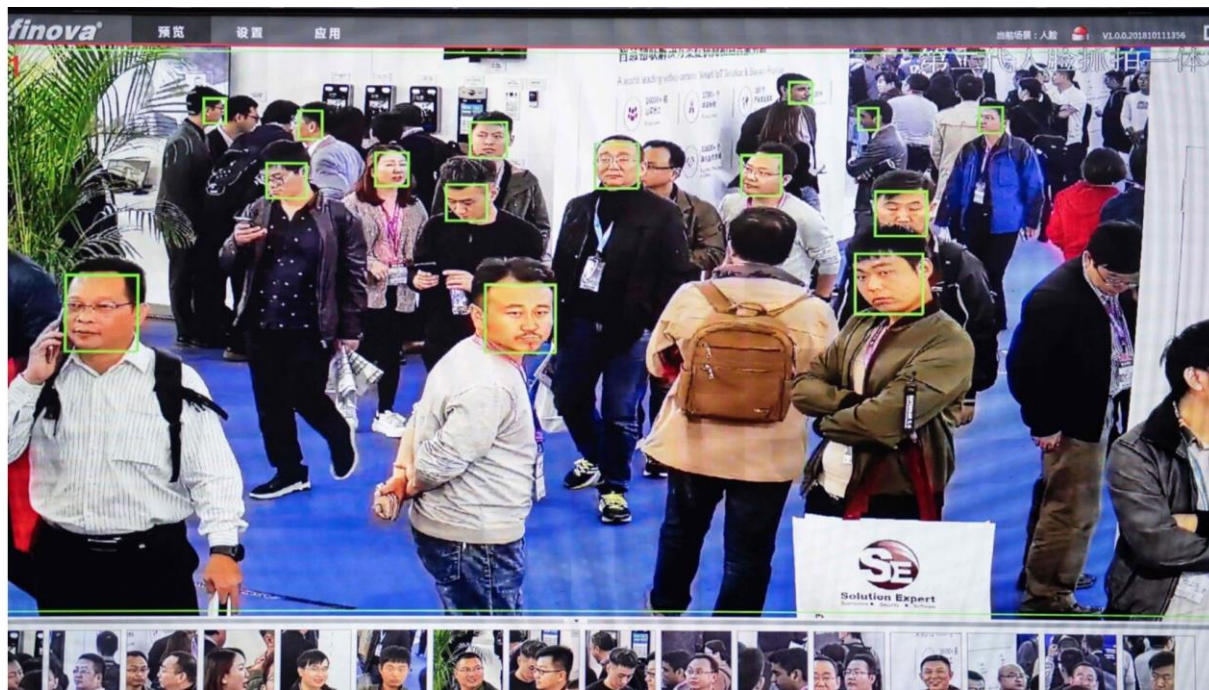
tylervigen.com



## Artificial Intelligence

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# Microsoft's neo-Nazi sexbot was a great lesson for makers of AI assistants



# 'Big Brother': AI pioneer fears China's use of technology for surveillance and control

# Challenges to consider





- Must generate real **benefits** (trackable)
- Technology to build and deploy models
- Clear ability to execute necessary process change
- Data – sufficient volume, quality and understood (data champion)
- Business sponsorship
- Resourcing – both data scientists and business SMEs (virtual team)
- Reuse and scalability





Focus is on:

- agile/speed
- iterative/fail fast

## HOW TO BUILD A MINIMUM VIABLE PRODUCT

NOT LIKE THIS



1

2

3

4

LIKE THIS



1

2

3

4

5

# Phil Dodridge Head of Business Intelligence and Disruption

Airmic 2019 – Monday 3 June



# Into the



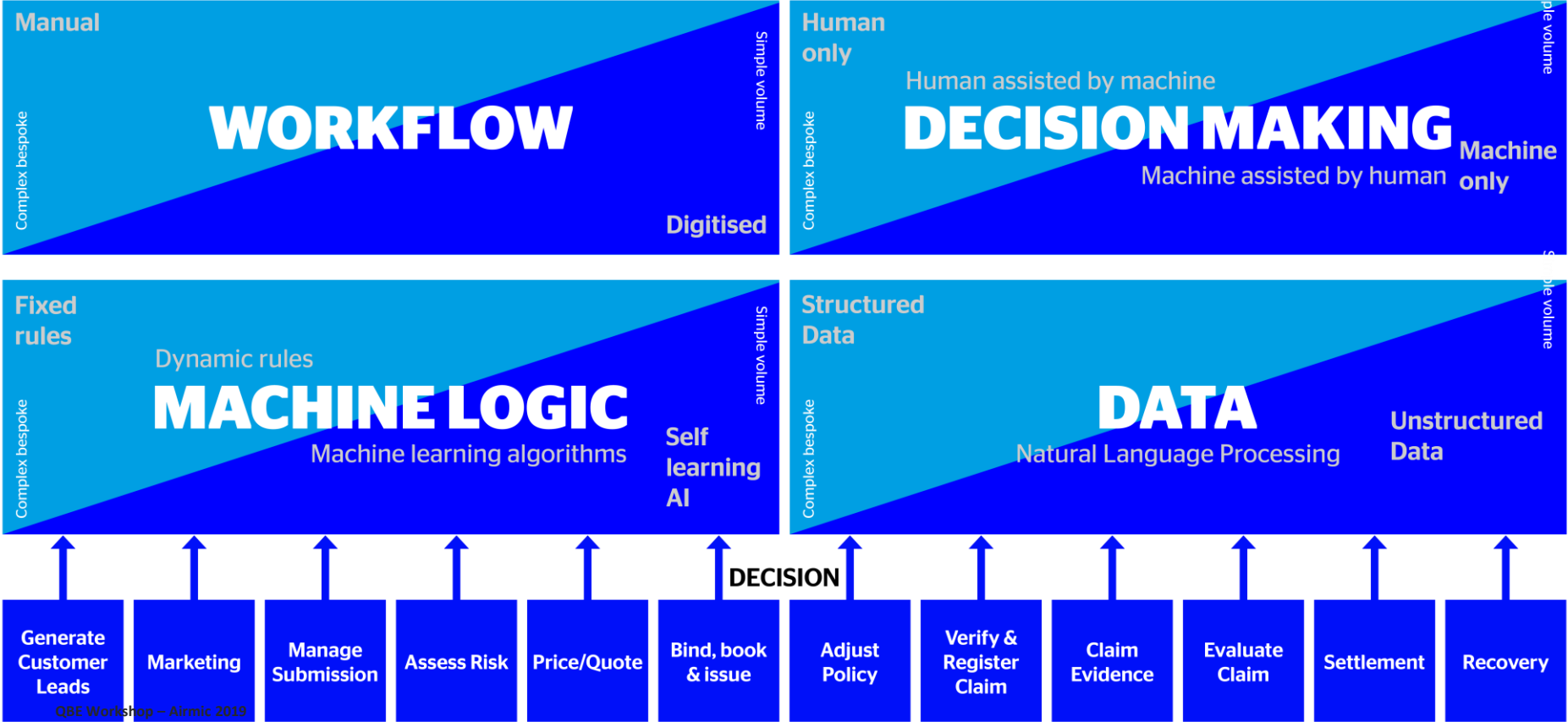
# Future...

**We stand on the brink of technological revolution that will fundamentally alter the way we live, work and relate to one another. In its scale, scope and complexity, the transformation will be unlike anything humankind has experienced before.**

**Klaus Schwab** Founder and Executive Chairman, World Economic Forum 2016

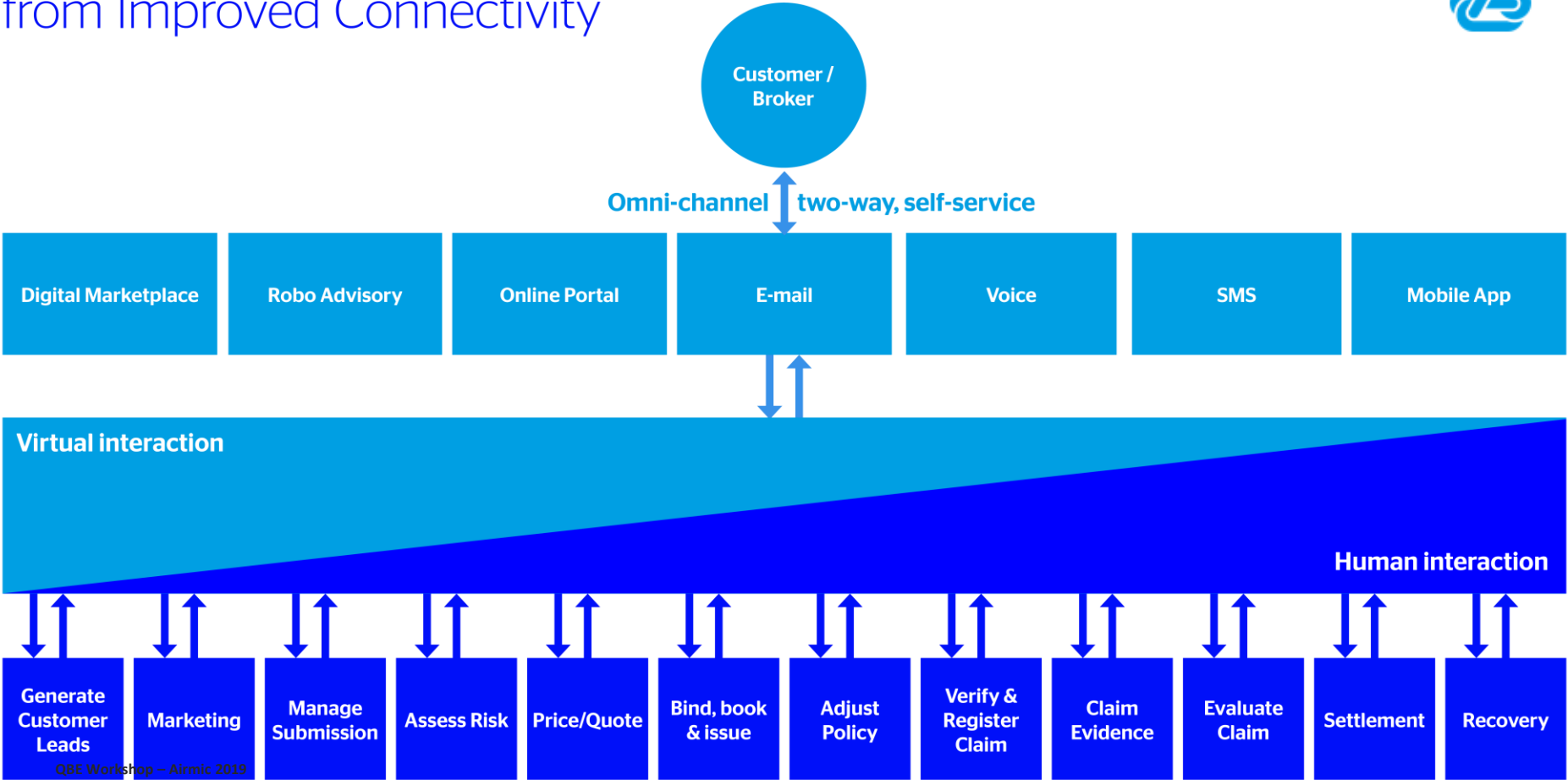
# Enhanced Customer Service

from Machine Driven Automation



# Enhanced Customer Engagement

from Improved Connectivity





## Question 1

**Number of YouTube videos watched per day worldwide is 5 billion**

**True / False?**



## Question 2

**Number of emails sent and received  
per day worldwide is 270 billion**

**True / False?**





### Question 3

**Number of Google searches  
per minute worldwide is 900,000**

**True / False?**



## Question 4

**Number of text messages sent  
per minute worldwide is 10 million**

**True / False?**



## Question 5

**Number of tweets sent  
per hour worldwide is 500 million**

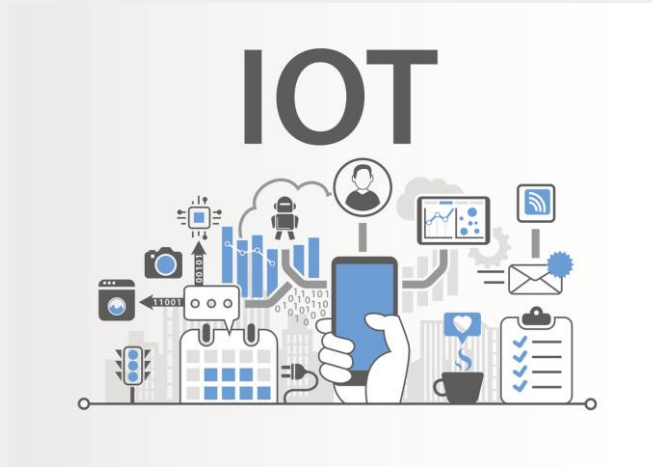
**True / False?**



## Question 6 (Tie Breaker)

**How many uber rides booked per day worldwide?**

What examples of new data have you used to help understand a company's risks better?



in everyday life



## Examples of IoT in the workplace

- Belt to monitor manual handling eg lifting, jumping; one belt has over 25 sensors
- Motor telematics via mobile phone that is nearly as accurate as a hard wired Black Box
- Wearable wrist band monitoring fatigue eg for construction or transportation workers
- On-site risk inspections using mobile technology
- Water pump sensors – vibration, temperature, noise, power consumption, water pressure, water flow
- Real time tracking of parcels/shipments - location, temperature, humidity
- Real time monitoring of performance of machinery eg engines/turbines/trains; hundreds of sensors
- Cameras detecting dangerous behaviour eg standing too close to train platform

What use of IoT are you seeing in the workplace?

## INTERNET OF THINGS

Telematics  
(eg cars)

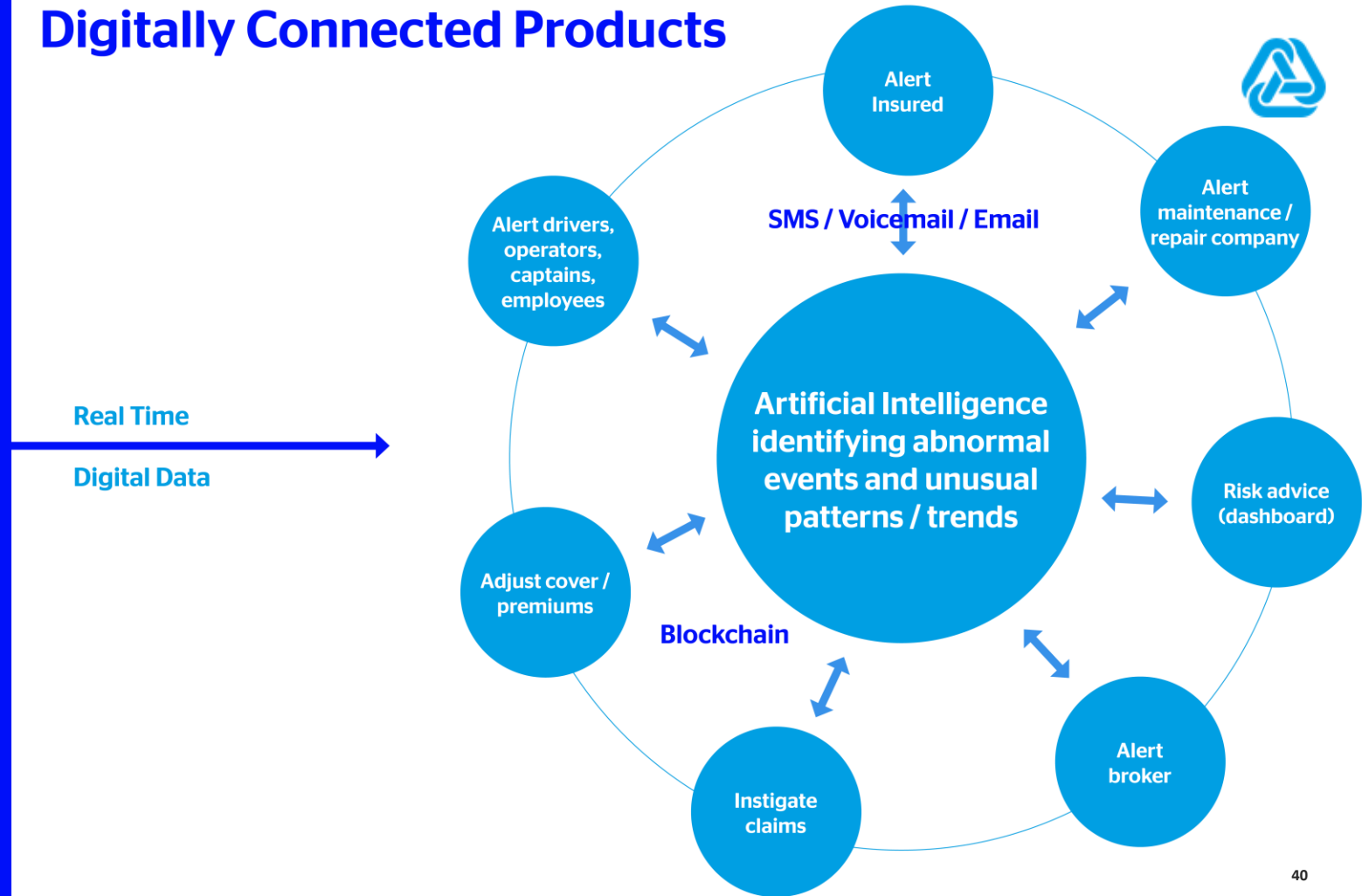
Smart Factory  
(eg water pressure  
sensor)

Vessel Tracking

Wearables  
(eg drowsiness)

Weather

# Digitally Connected Products







# Will machine intelligence surpass human intelligence by 2050?

a) Yes   b) No



**Moore's Law is a computing term coined by Intel co-founder Gordon Moore in 1965; the simplified version of this law states that processor speeds, or overall processing power for computers doubles every two years.**

## Exponential change

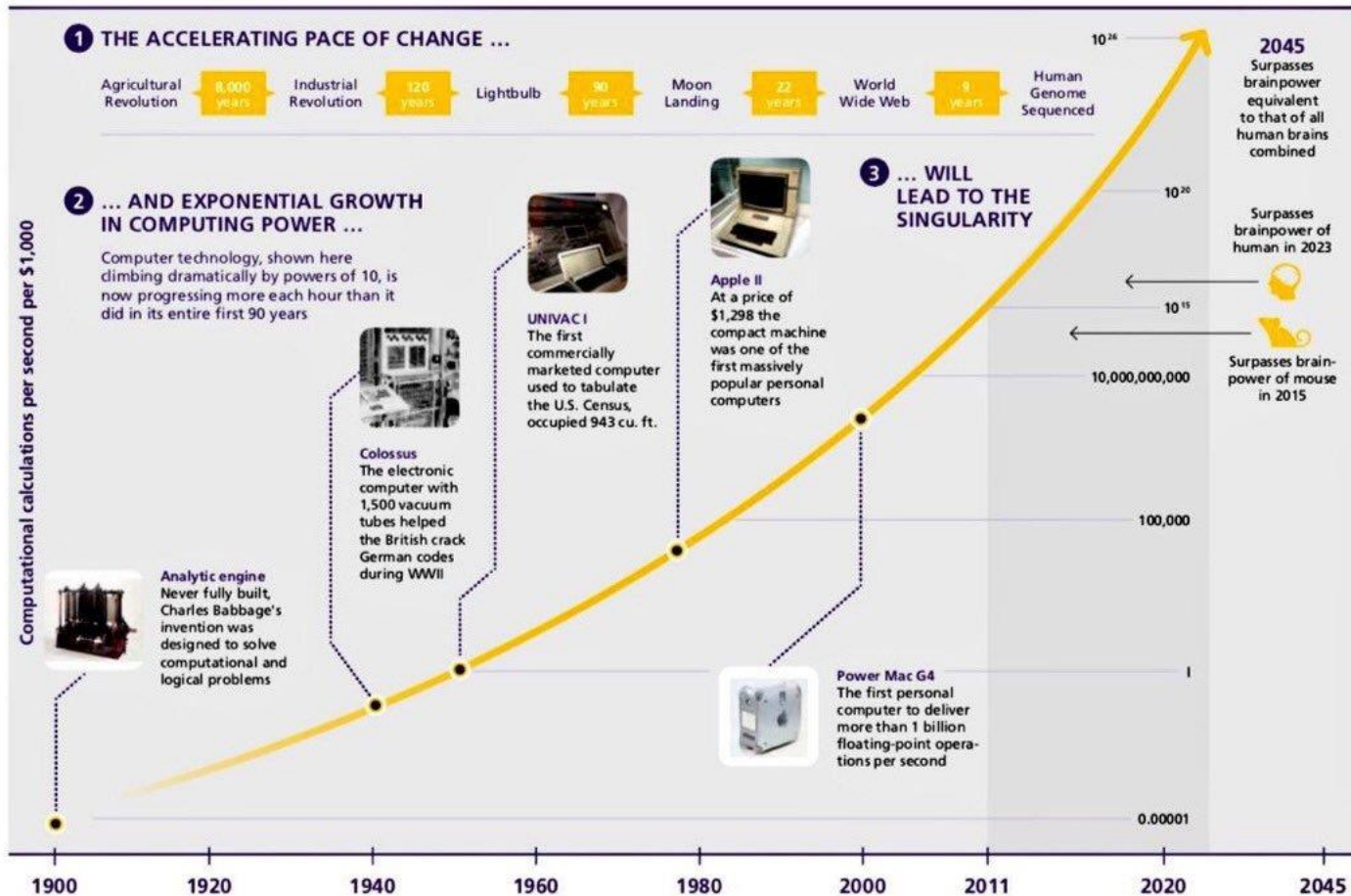
- what does this really look like?

Linear	Exponential
Steps (m)	Steps (m)
1	1
2	2
3	4
4	8
5	16
6	32
7	64
8	128
9	256
10	512
11	1,024
12	2,048
13	4,096
14	8,192
15	16,384
16	32,768
17	65,536
18	131,072
19	262,144
20	524,288
21	1,048,576
22	2,097,152
23	4,194,304
24	8,388,608
25	16,777,216
26	33,554,432
27	67,108,864
28	134,217,728
29	268,435,456
30	536,870,912



- 13 times around the world

# LAW OF ACCELERATING RETURNS



**Figure 12:** Ray Kurzweil's Law of Accelerating Returns depicts the exponential growth of computer processing power and technology innovations throughout history, and anticipates computers will exceed human intelligence in the future; **Source:** TIME / Wikipedia

It's insurance,  
but not as we know it...

**Made possible**



**QBE**

Any questions?