

EMERGING TECHNOLOGIES



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Outline

- Defining the term: Emerging technologies
- Looking at an example of emerging technology
- Videos and discussion
- This session will be interactive
 - Stop me if you have any questions
 - I will also ask you questions

Questions

- What is meant by emerging technologies?
- Give examples of such technologies
- Group/pair work

What is meant by emerging technologies?

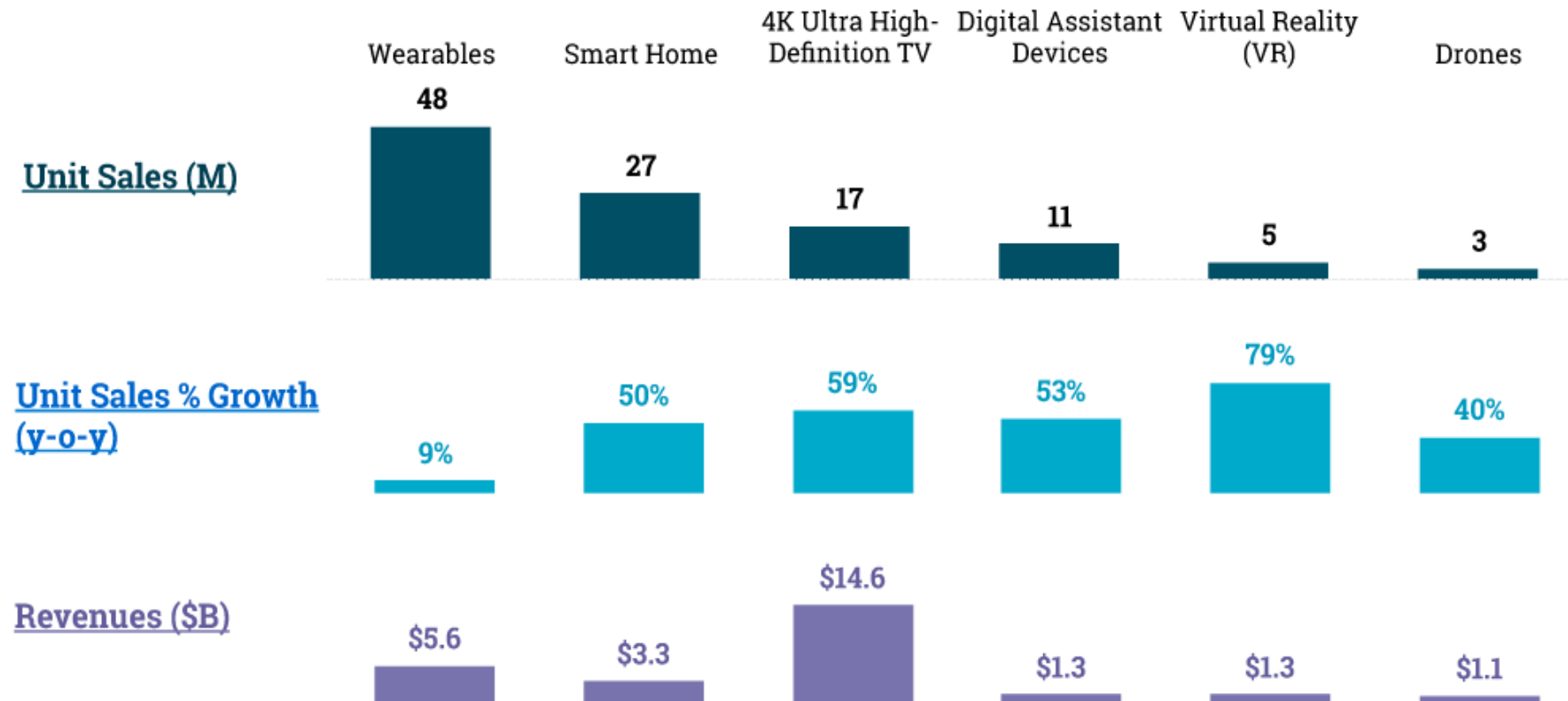


- **Emerging Technology**

- The term commonly refers to **technologies** that are currently developing, or that are expected to be available within the next five to ten years, and is usually reserved for **technologies** that are creating, or are expected to create, significant social or economic effects.

Emerging technologies: Social and economic impact

Emerging Tech Sales Trends in 2017

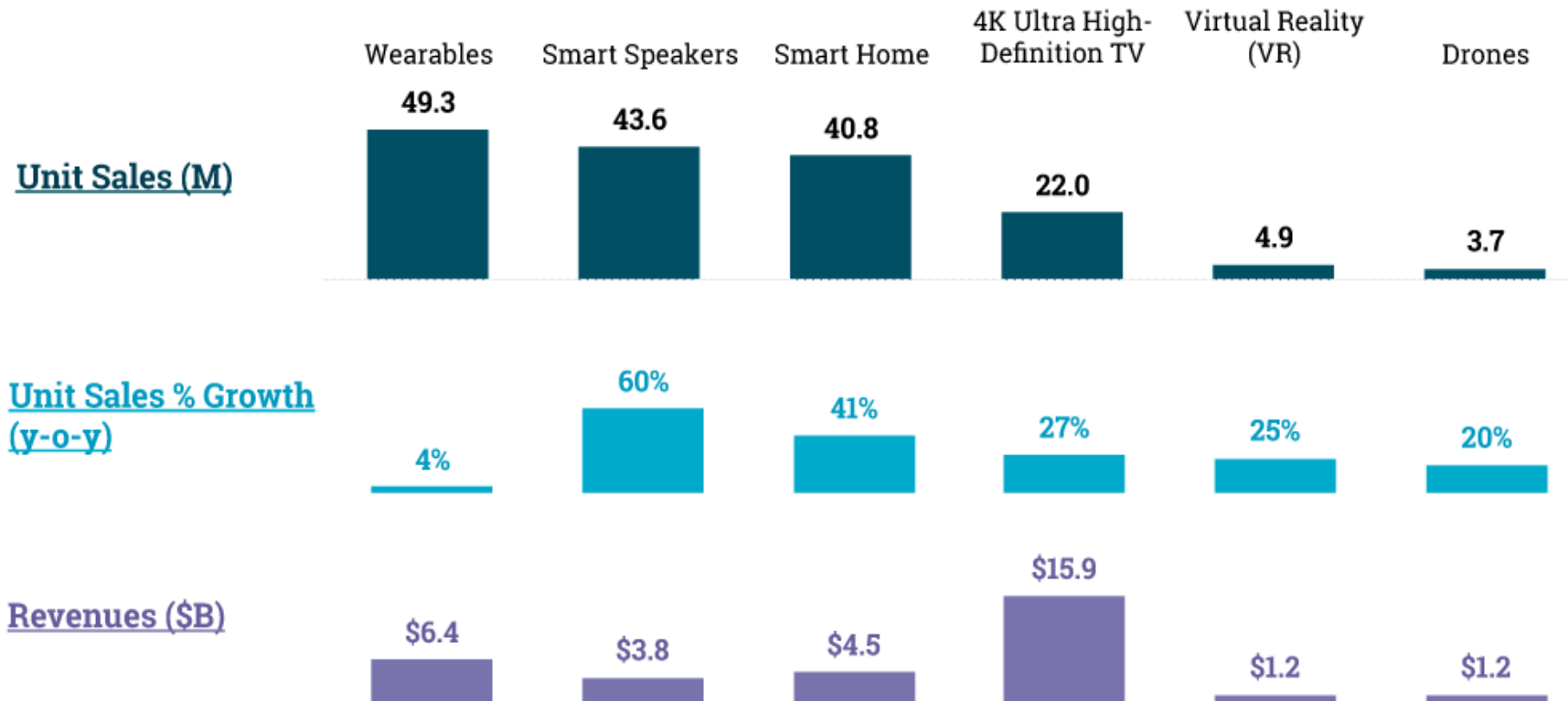


Published on MarketingCharts.com in August 2017 | Data Source: Consumer Technology Association (CTA)

Based on CTA projections

Emerging technologies: Social and economic impact

Emerging Tech Sales Forecast for 2018



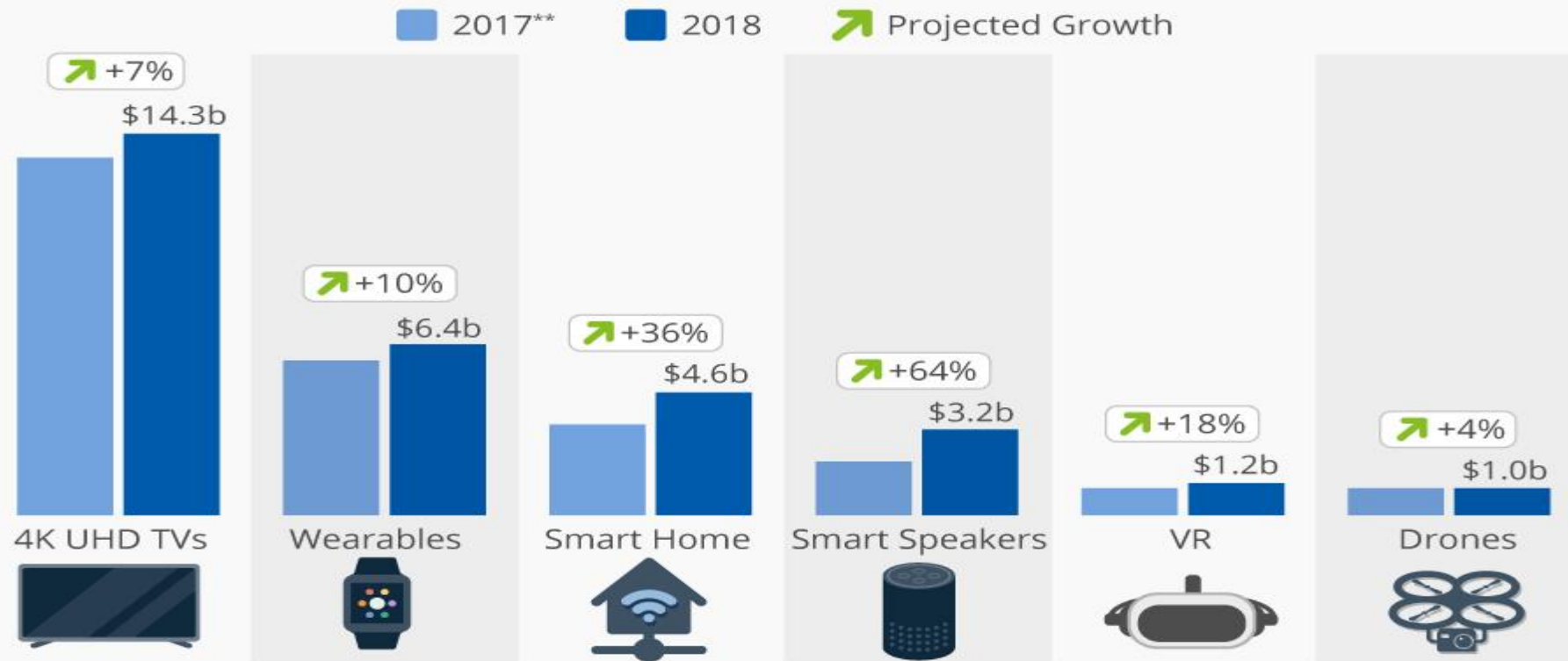
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Emerging technologies: Social and economic impact

How Big Are the "Next Big Things" in Tech?

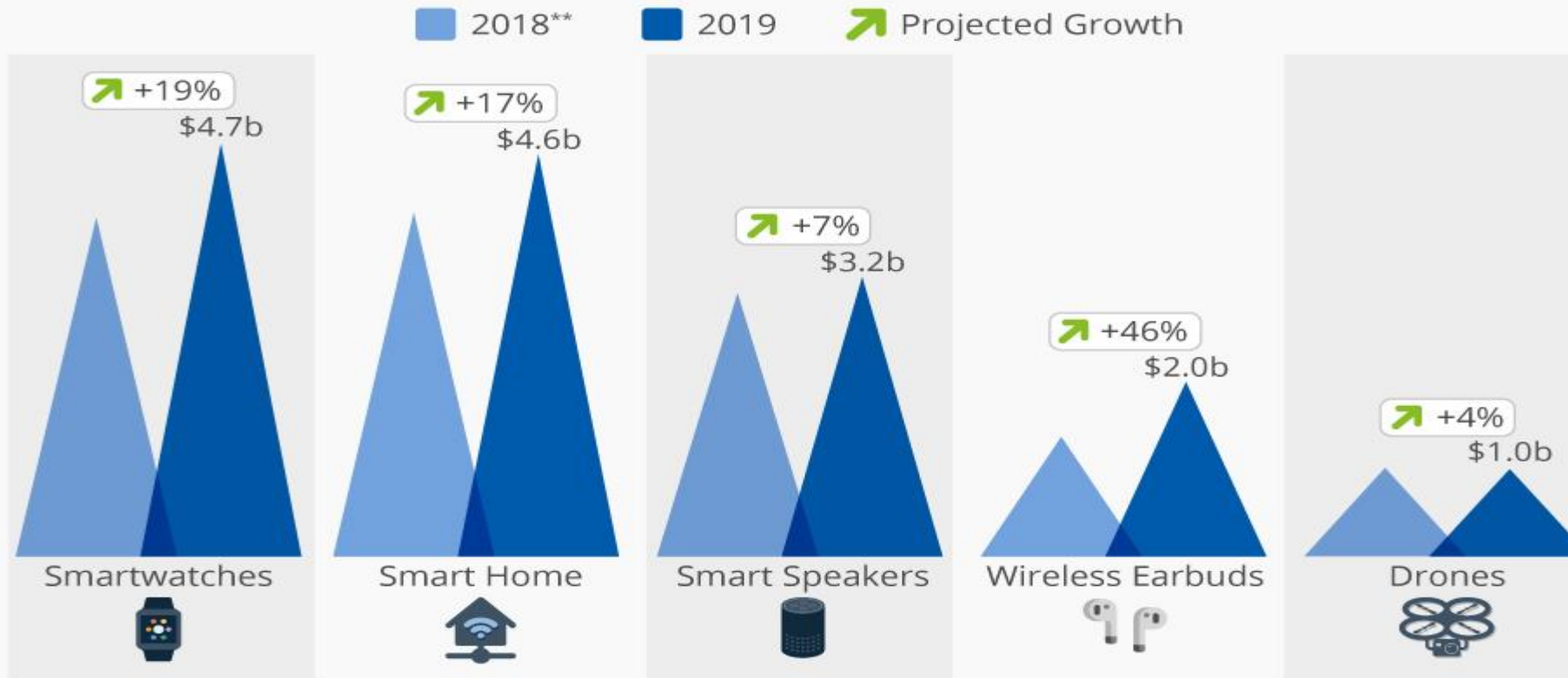
Estimated revenue from sales of emerging tech products in the United States in 2018*



Emerging technologies: Social and economic impact

How Big Are the "Next Big Things" in Tech?

Estimated revenue from sales of emerging tech products in the United States in 2019*



Emerging technologies

The three essential future technologies



Data collection through IOT

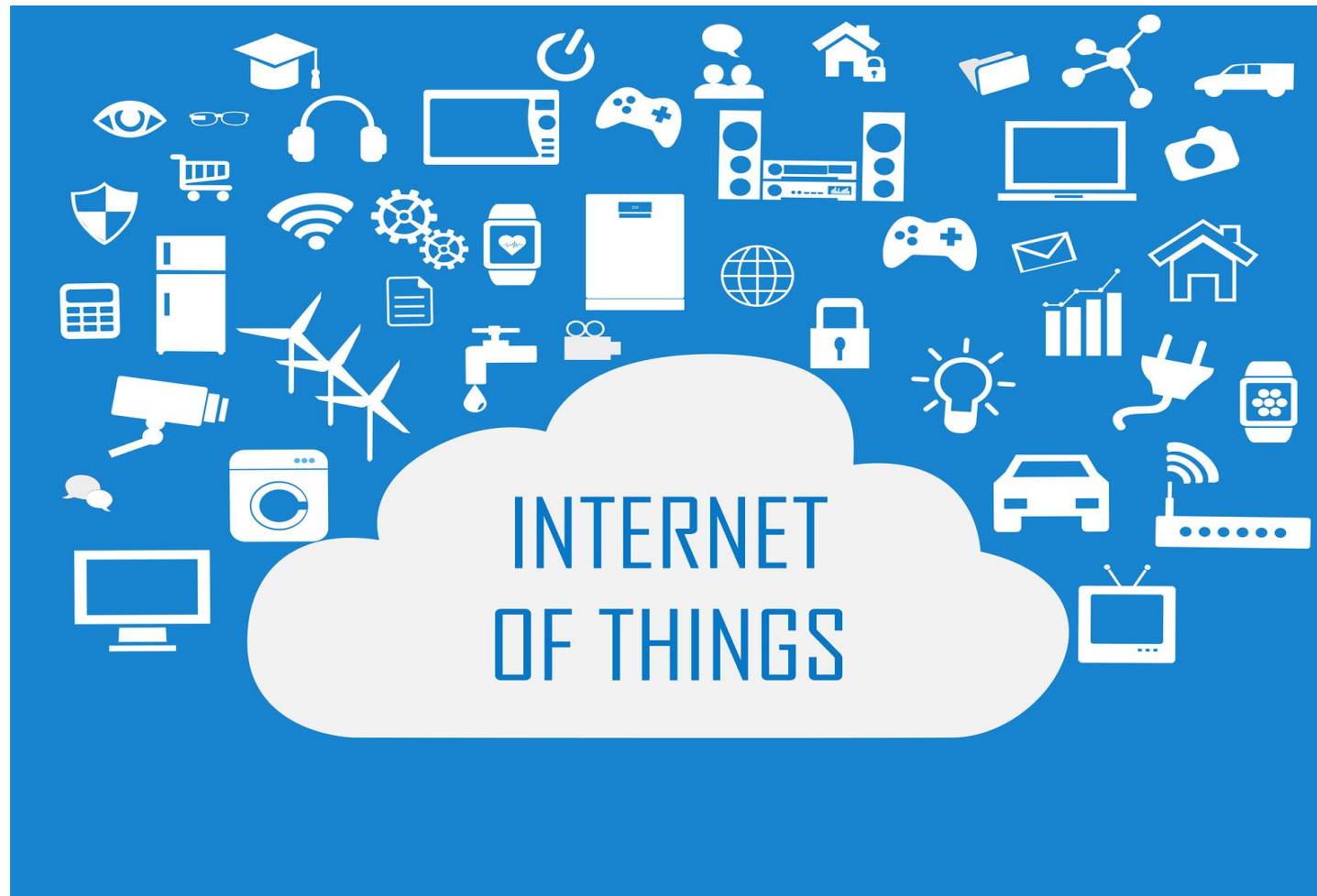


Capture, storages, analysis of data



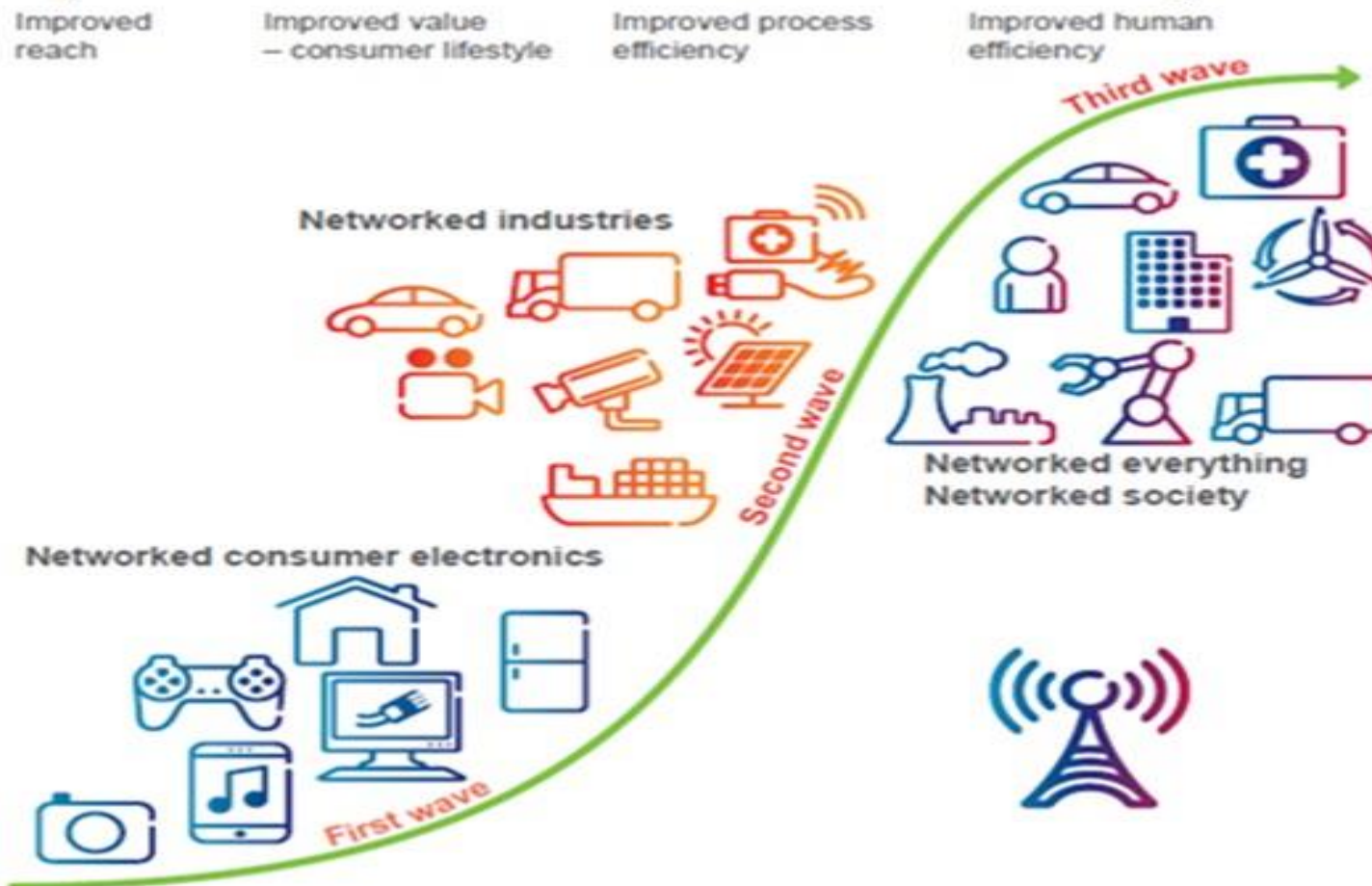
Data based learning

The Internet of things (Sources of Big Data)



The Internet of things

Figure 5: The Three Waves of Connected Device Development

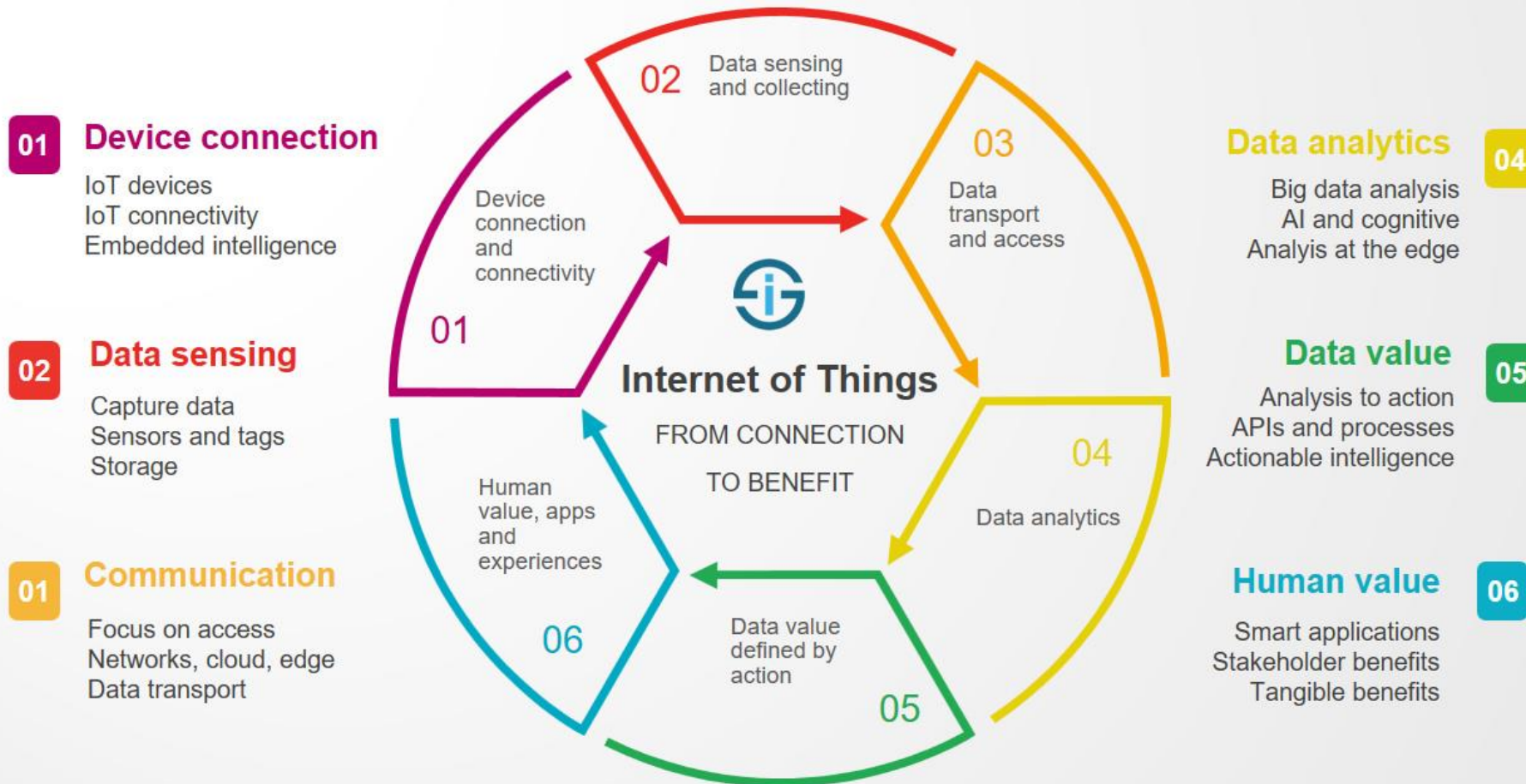


Source: Ericsson, 2011

The Internet of things

The Internet of Things

From connecting devices to human value





Higher Education Enterprise Programme



Defining the term - big data

- Big data: “the amount of data just beyond technology’s capability to store, manage, and process efficiently.” (Manyika, et al, 2011)
- Big data refers to “the increase in the volume of data that are difficult to store, process, and analyze through traditional database technologies.” (Fan et al., 2014)

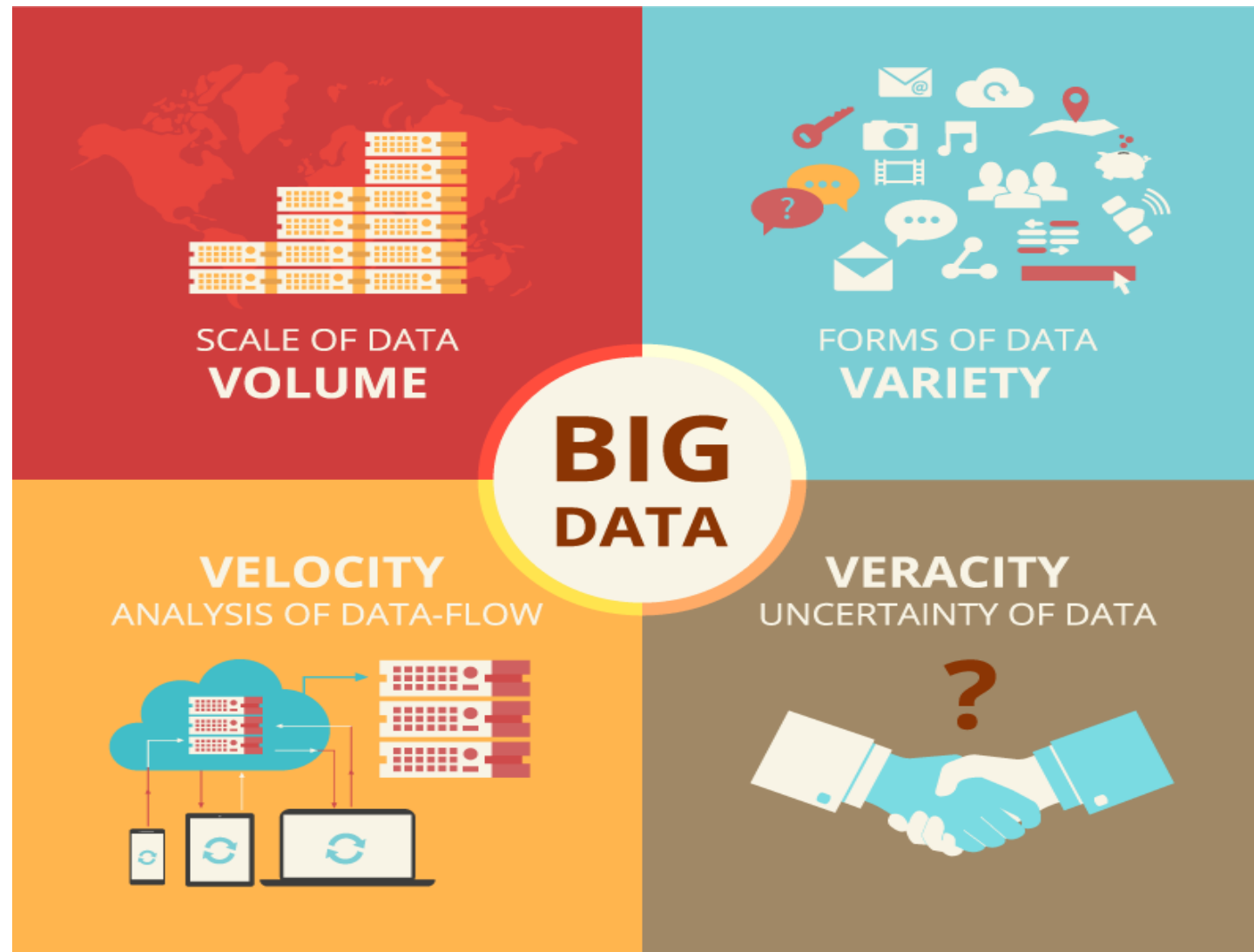
What makes data “Big” Data?



- “**Big data** is a term that is used to describe data that is high volume, high velocity, and/or high variety; requires **new technologies** and techniques to capture, store, and analyze it; and is used to **enhance decision making**, provide insight and discovery, and support and optimize processes”.

Watson (2014)

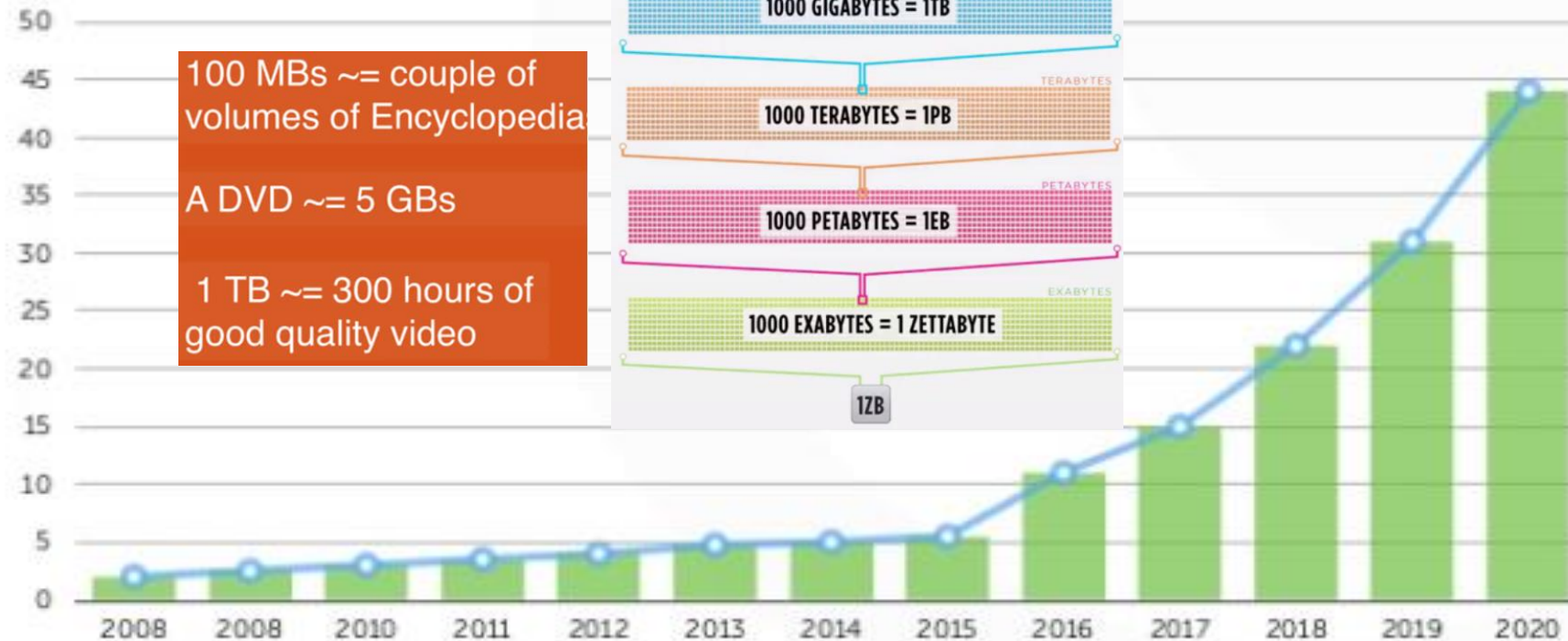
Characteristics of big data



Characteristics of Big Data: Scale (Volume)

Data is growing at a 40 percent compound annual rate, reaching nearly 45ZB by 2020

Data in Zettabytes (ZB)



Source: Oracle, 2012

Characteristics of Big Data: Complexity (Variety)

- Various formats, types, and structures
- Text, numerical, images, audio, video, sequences, time series, social media data, multi-dim arrays, etc...
- To extract knowledge → all these types of data need to be linked together

Characteristics of Big Data: Speed (Velocity)

- Data are being generated fast and need to be processed fast
- Late decisions → missing opportunities
 - **E-Promotions:** Based on your current location, your purchase history, what you like → send promotions right now for store near you
 - **Healthcare monitoring:** sensors monitor your activities and body → any abnormal measurements require immediate reaction

Characteristics of Big Data: Truthfulness (Veracity)

- Accuracy, Precision, Reliability, Integrity issues
- *So, how can we make decisions based on data with uncertainty?*

Why All the Fuss about Big Data?

- Better business opportunities for better decision-making, innovation, and competitiveness
- Decision-making requires accurate and effective information that is delivered:
 - At the right place and in context
 - At the right time and complete / credible / trusted
 - To the right person(s) who have authority to make decisions

What Exactly Is Big Data and Why Should You Care?

Video:

<https://www.youtube.com/watch?v=jGhRiwGHh30>

Group discussion question

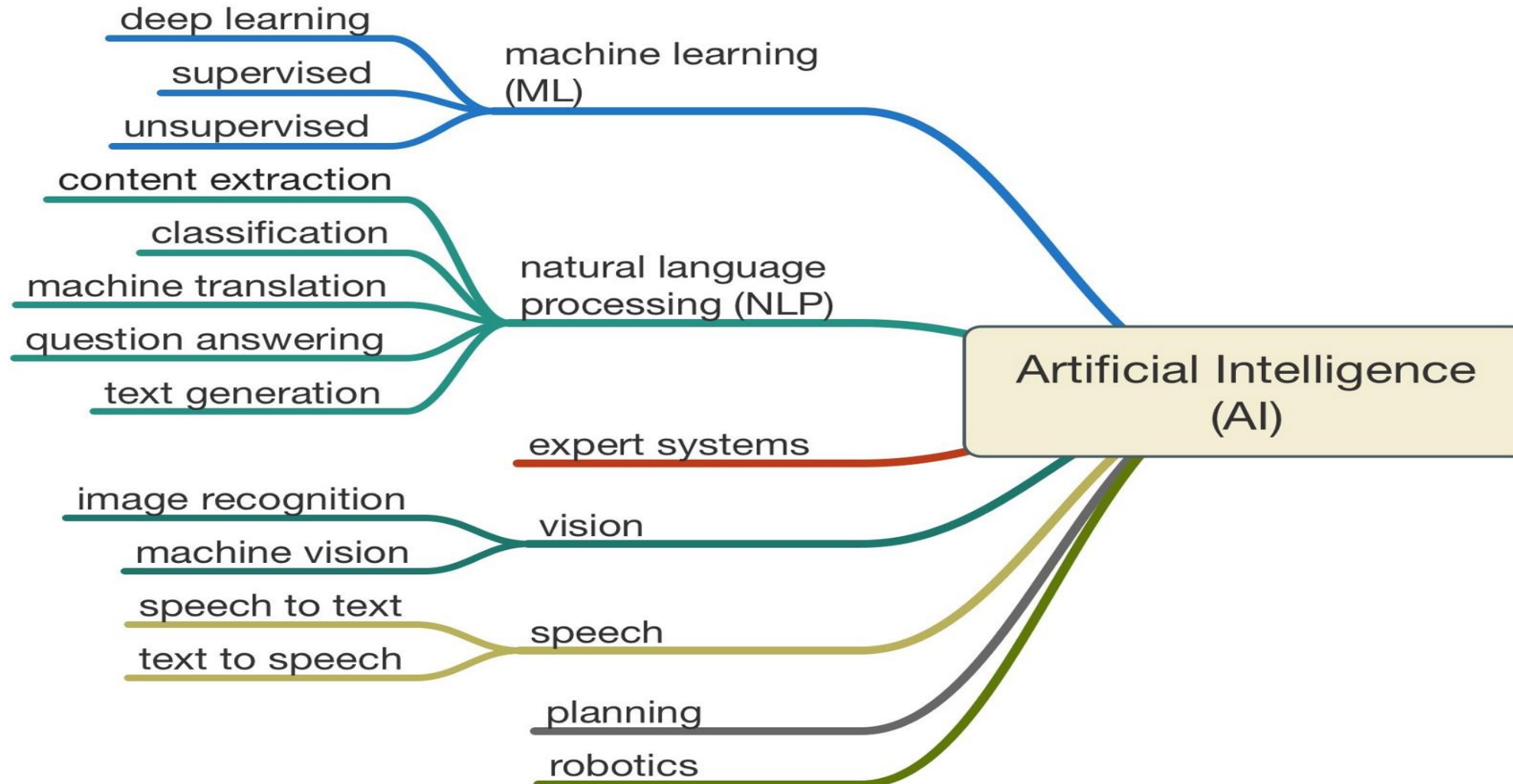
- What are the key points from the Video?
- What is the relevance to organizational decision-making?

What Can We Do with Big Data?



- Creating transparency
- Enabling experimentation to discover needs, expose variability, and improve performance
- Segmenting populations to customize actions
- Replacing/supporting human decision making
- Innovating new business models, products, and services

Artificial Intelligence

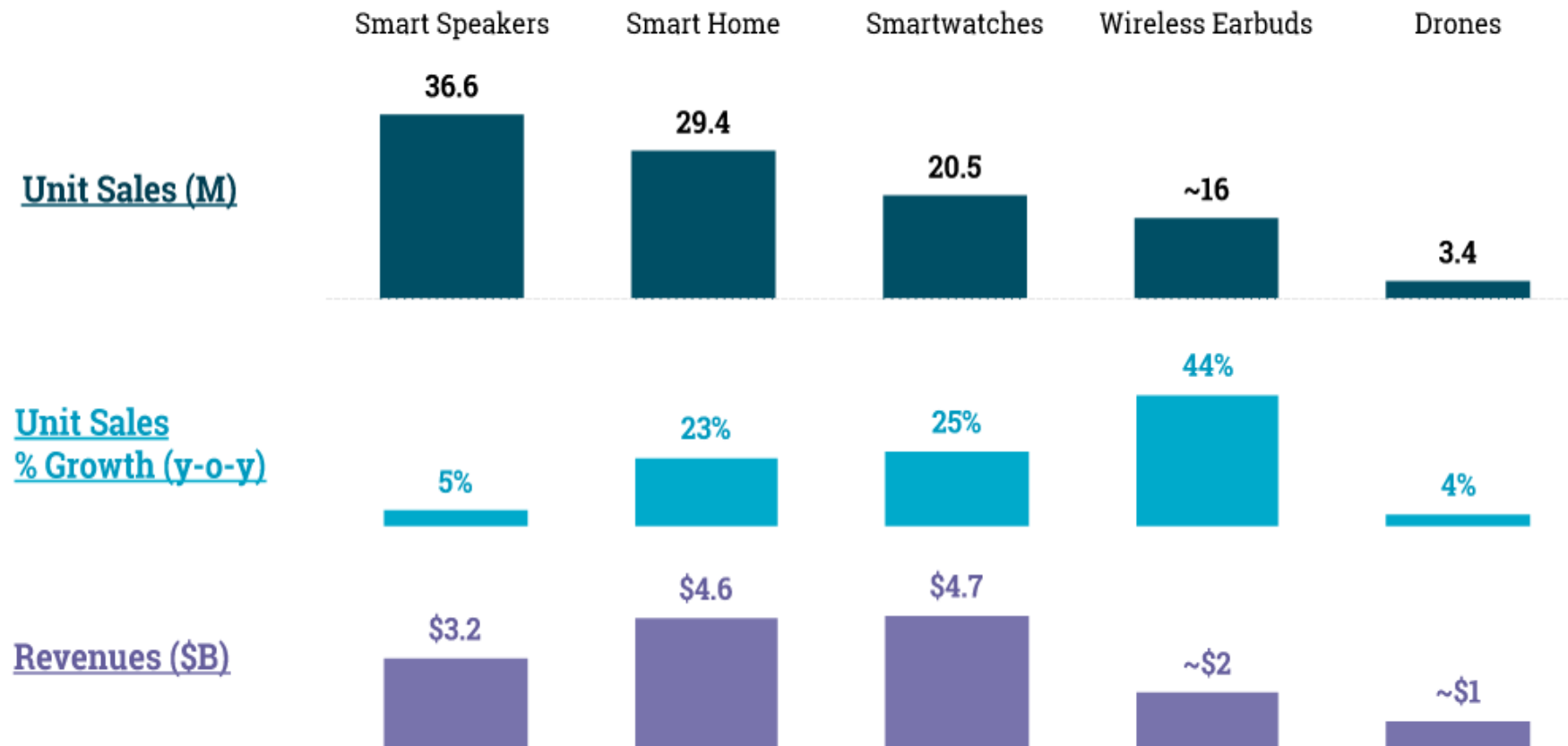


The impact of emerging technologies on business



The impact of emerging technologies on business

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Hottest Emerging Tech Jobs in 2019

1.

**Embedded Systems
R&D Test Engineer**
Avg. Annual Salary:
\$238,000

2.

**Deep Learning
Architect**

*Avg. Annual
Salary: \$213,700*

3.

**Machine Learning
Engineer**

Avg. Annual Salary:
\$213,000

4.

5G Solutions Engineer

Avg. Annual Salary:
\$197,000

5.

Blockchain Developer

Avg. Annual Salary:
\$162,500

Business applications of big data

- Video 2: Explaining big data
- https://www.youtube.com/watch?v=7D1CQ_LOizA
- List 3 things that you have learned from this video about the business application of big data.

Creative business ideas?



A mini video



Want to be more creative? Go for a walk



- **TED** talk by Marily Oppezzo
- https://www.ted.com/talks/marily_oppezzo_want_to_be_more_creative_go_for_a_walk
- When trying to come up with a new idea, we all have times when we get stuck. But according to research by behavioral and learning scientist Marily Oppezzo, getting up and going for a walk might be all it takes to get your creative juices flowing. In this fun, fast talk, she explains how walking could help you get the most out of your next brainstorm.

Emerging Technology Trends 2018



Democratized AI

- AI PaaS
- Artificial general intelligence
- Autonomous driving Level 4
- Autonomous driving Level 5
- Autonomous mobile robots
- Conversational AI platform
- Deep neural nets
- Flying autonomous vehicles
- Smart robots
- Virtual assistants



Digitalized Ecosystems

- Blockchain
- Blockchain for data security
- Digital twin
- IoT platform
- Knowledge graphs



Do-It-Yourself Biohacking

- Biochips
- Biotech — cultured or artificial tissue
- Brain-computer interface
- Exoskeletons
- Augmented reality
- Mixed reality
- Smart fabrics



Transparently Immersive Experiences

- 4D printing
- Connected home
- Edge AI
- Self-healing system technology
- Silicon anode batteries
- Smart dust
- Smart workspace
- Volumetric displays



Ubiquitous Infrastructure

- 5G
- Carbon nanotube
- Deep neural network ASICs
- Neuromorphic hardware
- Quantum computing

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