TEMPLE UNIVERSITY

Digital Systems

6.1 Information Systems: Part III – Data Analytics

FOX MIS

ROADMAP

START

Week 1:
Introduction & Systems Analysis
- Course Description
- Systems Thinking

Week 2:
Digital Product Management & Introduction to Process Mapping
- Max Labs 1a & 1b
- Systems & Processes
- Swim Lane Diagrams

Week 3:
Data Modeling with Entity Relationship Diagrams
- Swim Lane Diagrams
- ERD Diagrams

Week 4:
Digital Systems – Learn IT! #1
- ERD Diagrams
- Learn IT Kickoff

Week 5:
Exam #1, Max Labs & Information Systems: Part I & II
- CRM & ERP

Week 6:
Information Systems: Part III & IV
- Data Analytics
- SCM

Week 7:
Platforms & Digital Business Models: Part I & II
- Platforms & Digital Models
- APIs

Week 8:
Cybersecurity & AI – Part I & II
- Protection Protocols
- Artificial Intelligence

Week 9:
Exam #2 & JavaScript Unit #1 - Part I & II
- Hello World, Variables

Week 10:
JavaScript Unit #2 Functions
- Operator types
- Strings

Week 11:
JavaScript Unit #3 Logical Operators & Conditional Logic
- Logical Operators
- Conditional Types

Week 12:
JavaScript Unit #4 Loops
- Intro to Loops
- While and Do

Week 13:
JavaScript Unit #4 Working with Loops
- Writing the code

Week 14:
HTML & CSS Unit
- HTML basics
- CSS basics
- Course Reflection

FINISH

Who has created/contributed some data already today?

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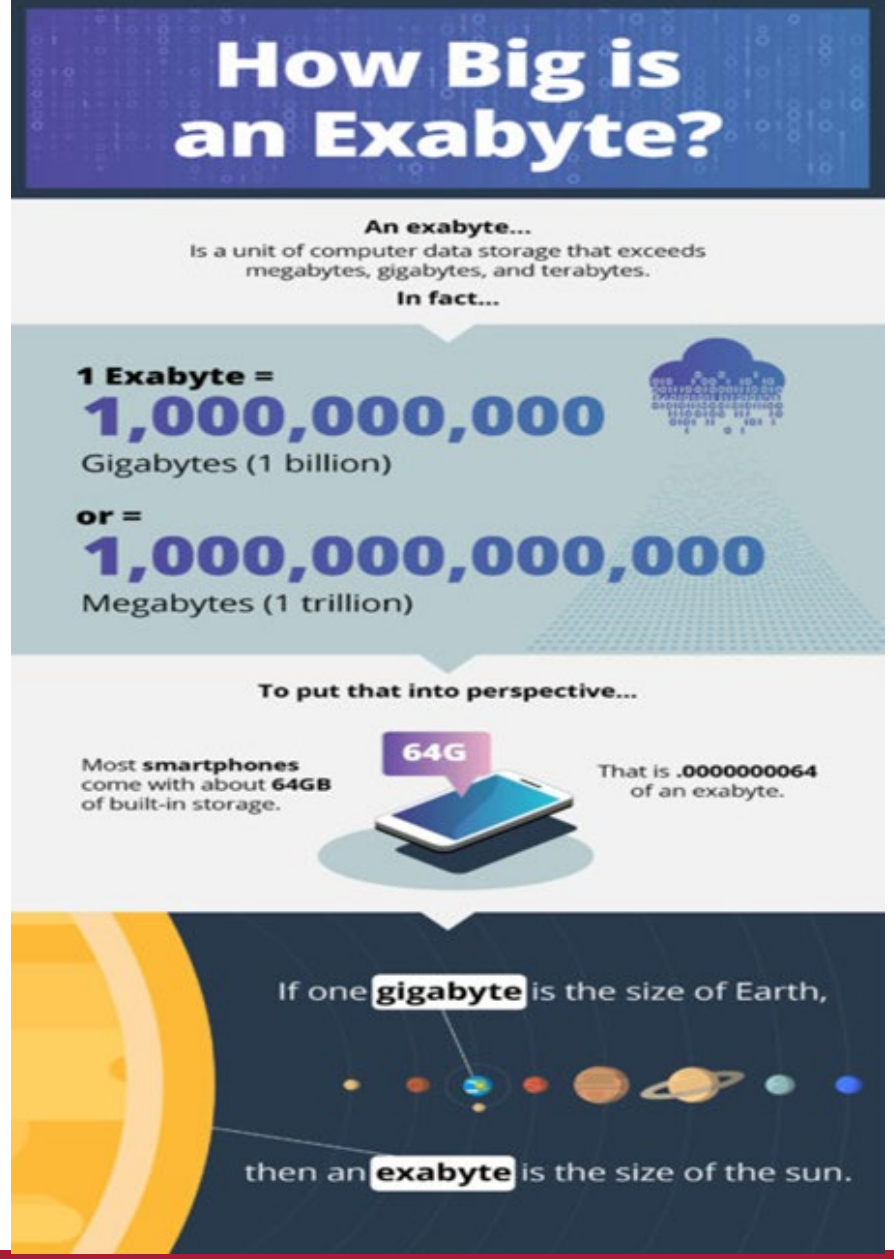
Units of data…

- 1.7MB of data is created every second by every person during 2020.
- In the last two years alone, the astonishing 90% of the world's data has been created.
- 2.5 quintillion bytes of data are produced by humans every day.
- 463 exabytes of data will be generated each day by humans as of 2025.
- 95 million photos and videos are shared every day on Instagram.
- By the end of 2020, 44 zettabytes will make up the entire digital universe.
- Every day, 306.4 billion emails are sent, and 500 million Tweets are made.



SME 4X PRESENTS

THE BIG DATA GOLD RUSH

DON'T BELIEVE US, HERE'S WHAT IS PREDICTED FOR 2020

6.1 BN
smartphone users globally [1]

1.7 MB
of new information will be created every second for every human being on the planet. [2]

50 BN
smart connected devices [3] in the world, all developed to collect, analyze and share data.

3RD
of all data [4] will pass through the cloud .

$65 MN
additional net income [5] will be the result of just 10% increase in data accessibility for a typical Fortune 1000 company

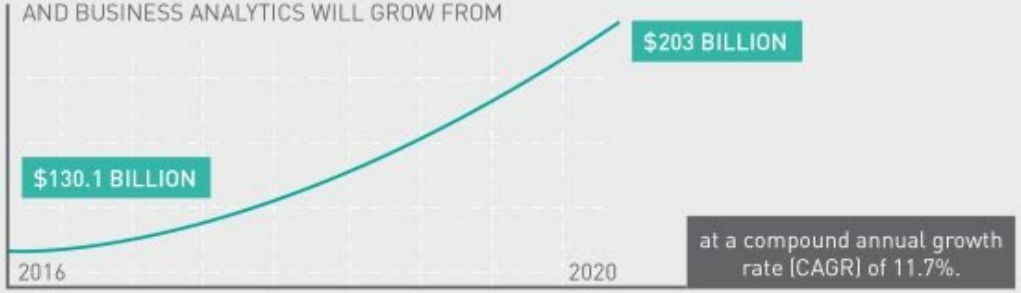
60%
of information delivered to decision makers will be considered by them always actionable, doubling the rate from the current (2015) level. [6]

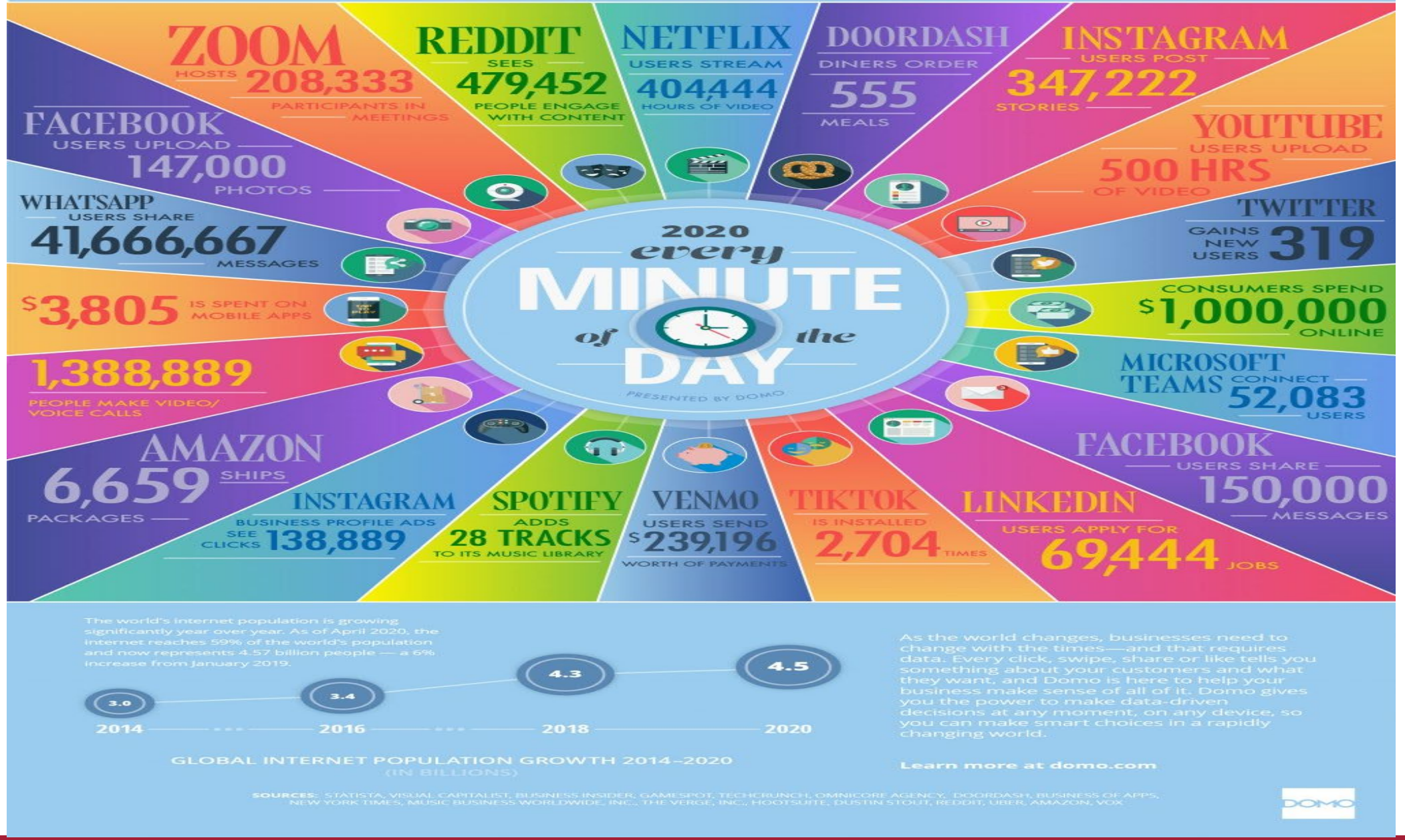
50%
of all business analytics software will incorporate prescriptive analytics built on cognitive computing functionality. [6]

90%
of databases will be based on memory-optimized technology. [6]

THE INDUSTRIES DRIVING MUCH OF THIS GROWTH INCLUDE:

IDC SAYS THAT WORLDWIDE REVENUES FOR BIG DATA AND BUSINESS ANALYTICS WILL GROW FROM




ZOOM
HOSTS 208,333
PARTICIPANTS IN MEETINGS
REDDIT
SEES 479,452
PEOPLE ENGAGE WITH CONTENT
NETFLIX
USERS STREAM 404,444
HOURS OF VIDEO
DOORDASH
DINERS ORDER 555
MEALS
INSTAGRAM
USERS POST 347,222
STORIES
FACEBOOK
USERS UPLOAD 147,000
PHOTOS
YOUTUBE
USERS UPLOAD 500 HRS
OF VIDEO
WHATSAPP
USERS SHARE 41,666,667
MESSAGES
TWITTER
GAINS NEW USERS 319
2020 every MINUTE of the DAY
PRESENTED BY DOMO
$3,805 IS SPENT ON MOBILE APPS
CONSUMERS SPEND $1,000,000 ONLINE
1,388,889
PEOPLE MAKE VIDEO/ VOICE CALLS
MICROSOFT TEAMS CONNECT 52,083 USERS
AMAZON
6,659 SHIPS
PACKAGES
FACEBOOK
USERS SHARE 150,000
MESSAGES
INSTAGRAM
BUSINESS PROFILE ADS SEE CLICKS 138,889
SPOTIFY
ADDS 28 TRACKS
TO ITS MUSIC LIBRARY
VENMO
USERS SEND $239,196
WORTH OF PAYMENTS
TIKTOK
IS INSTALLED 2,704 TIMES
LINKEDIN
USERS APPLY FOR 69,444 JOBS
The world's internet population is growing significantly year over year. As of April 2020, the internet reaches 59% of the world's population and now represents 4.57 billion people — a 6% increase from January 2019.
3.0
3.4
4.3
4.5
2014
2016
2018
2020
GLOBAL INTERNET POPULATION GROWTH 2014–2020
(IN BILLIONS)
As the world changes, businesses need to change with the times—and that requires data. Every click, swipe, share or like tells you something about your customers and what they want, and Domo is here to help your business make sense of all of it. Domo gives you the power to make data-driven decisions at any moment, on any device, so you can make smart choices in a rapidly changing world.
Learn more at domo.com
SOURCES: STATISTA, VISUAL CAPITALIST, BUSINESS INSIDER, GAMESPOT, TECHCRUNCH, OMNICORE AGENCY, DOORDASH, BUSINESS OF APPS, NEW YORK TIMES, MUSIC BUSINESS WORLDWIDE, INC., THE VERGE, INC., HOOTSUITE, DUSTIN STOUT, REDDIT, UBER, AMAZON, VOX
DOMO

How does data influence …

- Purchasing Habits
- Hiring
- Where you eat
- Politics
- Your decision making

How does data influence …

- The importance of data in decision lies in consistency and continual growth. It enables companies to create new business opportunities, generate more revenue, predict future trends, optimize current operational efforts, and produce actionable insights.

Source: https://medium.com/seamfix-engineering/data-analysis-and-its-importance-for-intelligent-data-driven-business-decisions-fccb9728278a

Data is Nothing New to Business

- We've always had data; we've always used data…
- Now we have more! Yay! But wait…
- What has this changed?
  - Who?
  - What?
  - When?

Data as an Asset

- In a data-driven enterprise, data and analytics are no longer afterthoughts — they are fundamental to digital business transformation. Yet the ability to "think in data" is difficult for most enterprises.

What is Data Analytics?

Thoughts?

"The use of tools & people to uncover hidden patterns in the data that might not be readily available to the naked eye"

– Professor Lavin

Source: https://i2.wp.com/johnbauerconsulting.com/wp-content/uploads/2017/06/Big-Data-Analysis-In-HR-Department.jpg

What is Data Analytics?

- **Three Types of Data Analytics:**
  - Descriptive
  - Predictive
  - Prescriptive

Source: https://i2.wp.com/johnbauerconsulting.com/wp-content/uploads/2017/06/Big-Data-Analysis-In-HR-Department.jpg

What is Data Analytics?

Three Types of Data Analytics:

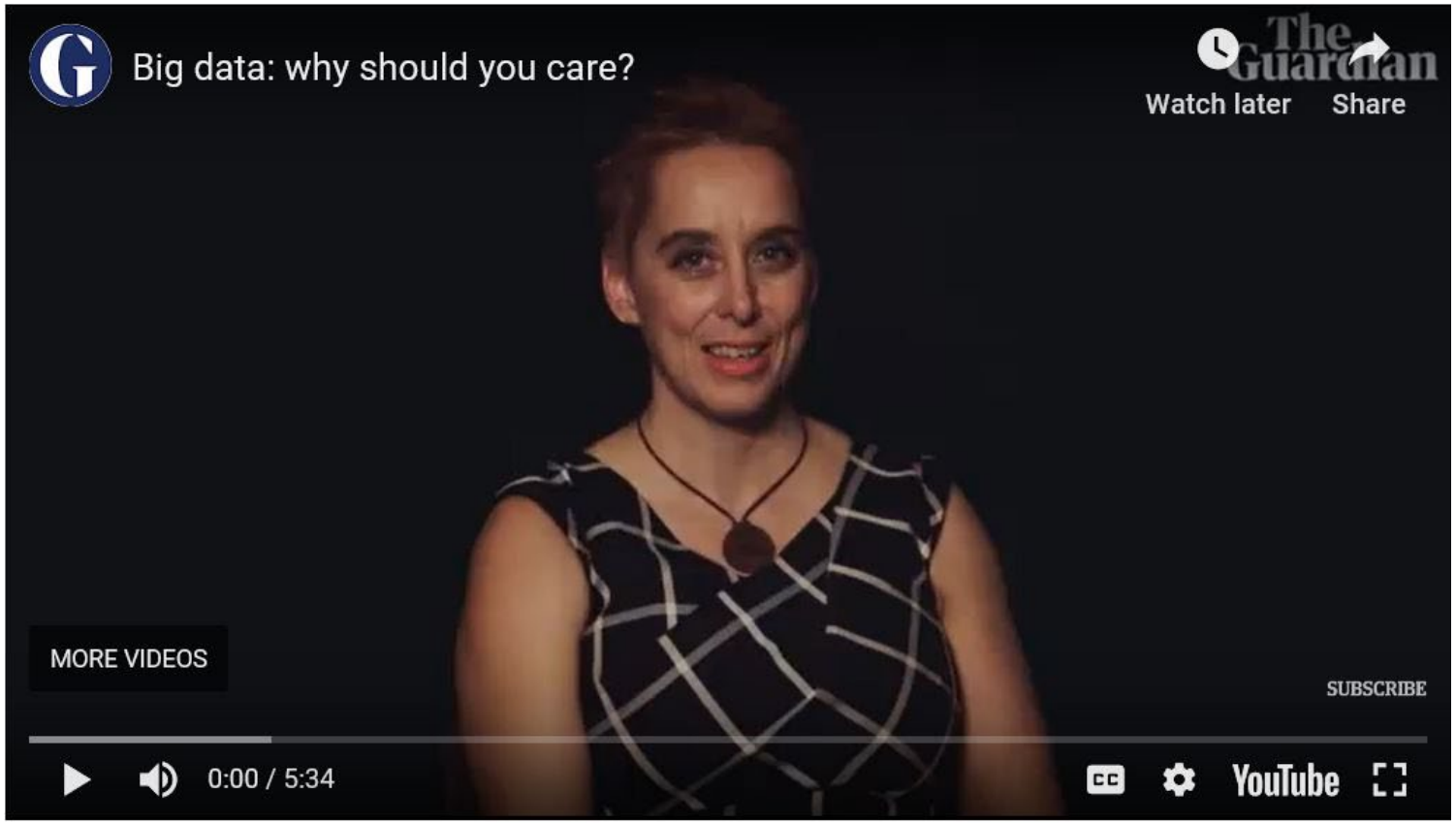
Descriptive analytics	Summarizes past data
Predictive analytics	Forecast of what may happen in the future
Prescriptive analytics	Helps facilitate decision-making

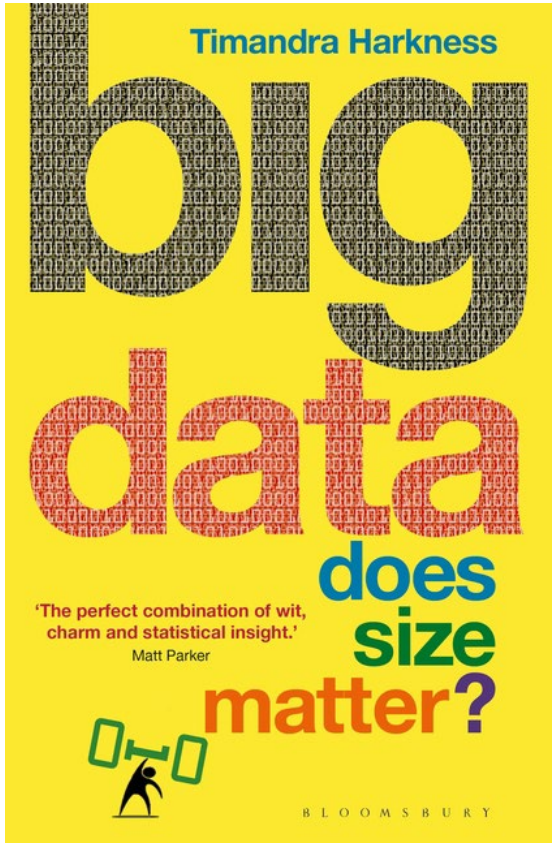
Source: https://i2.wp.com/johnbauerconsulting.com/wp-content/uploads/2017/06/Big-Data-Analysis-In-HR-Department.jpg

“Analytics is the process of making sense of large data sets and unlocking patterns, often using data visualization, to enable better decision making.”

- Professor Amy Lavin

What is Big Data…Why Care?

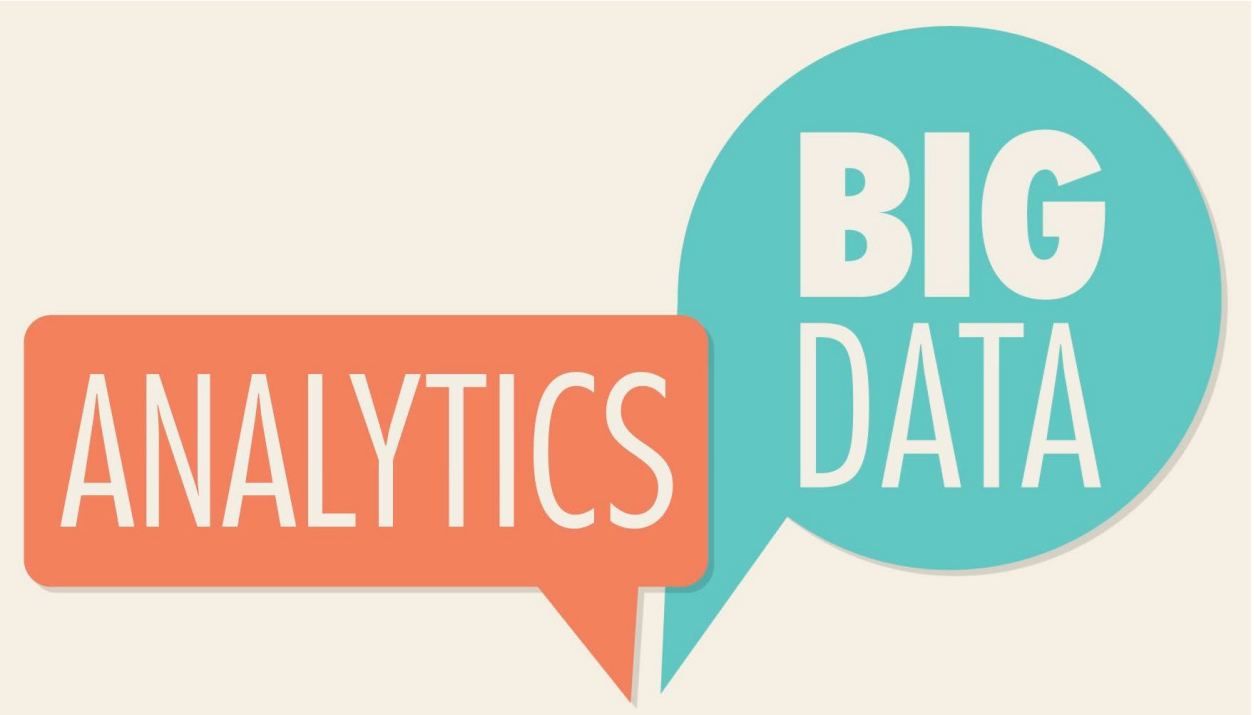




Source: https://www.bloomsbury.com/uk/big-data-9781472920065/

Data Investments…Why Care?

- **What is the value of Big Data to organizations :**
  - Decrease Expenses
  - Find New Innovations
  - Launch New Products/Services
  - Increase Efficiency
  - Transform Business
  - Establish Data-Driven Culture



Source: https://hbr.org/video/3633937151001/the-explainer-big-data-and-analytics

https://hbr.org/2017/04/how-companies-say-theyre-using-big-data

Big Data & Mickey D's

$300 Million Acquisition

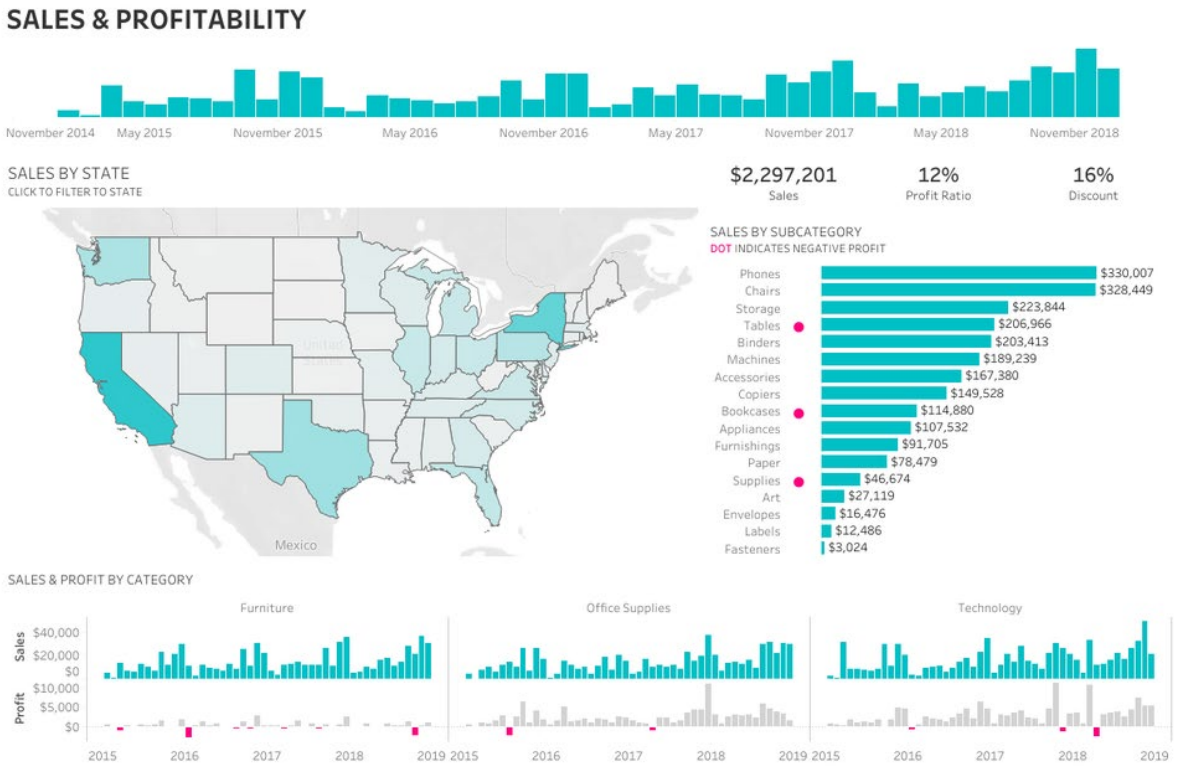
- Predictive Analytics
- Infrastructure Improvements
- Technology Transformation
- Digital Innovation
- Efficiency & Effectiveness
- Customer Experience

Source: KIYOSHI OTA/BLOOMBERG/GETTY IMAGES

What can data do for you?

Data Analysis & Data Visualization

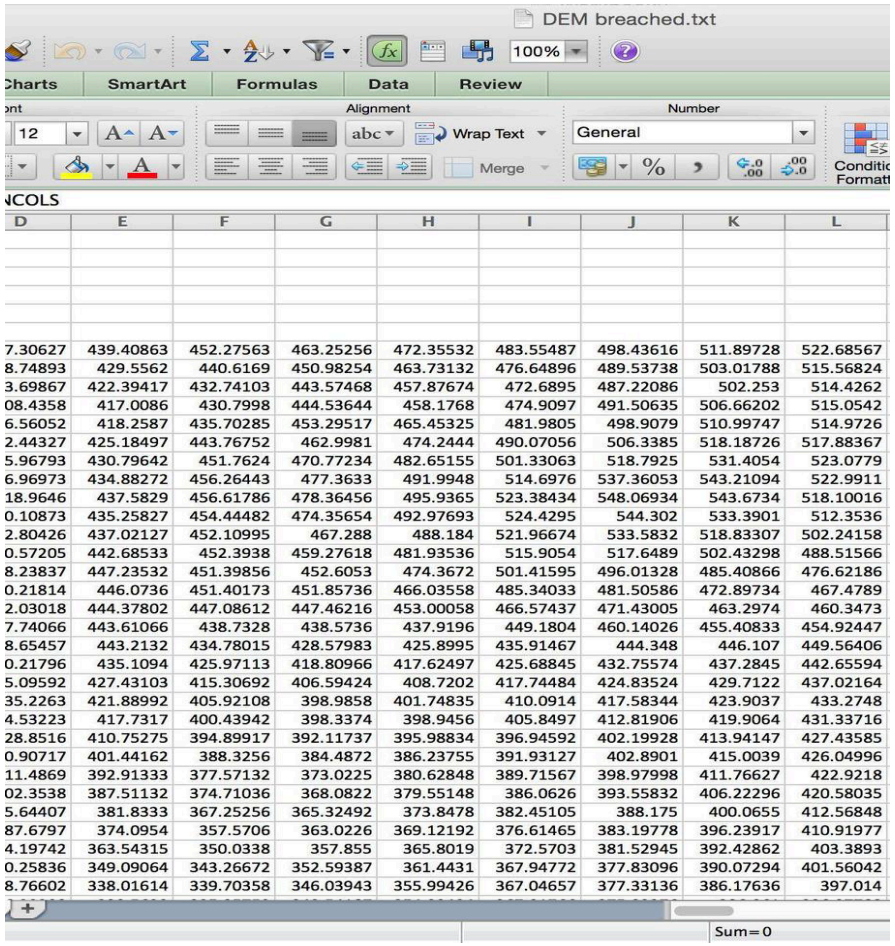
- What's the difference?
- What's the role of the dashboard?
  - Who are your stakeholders?
  - Which industries utilize dashboards?
  - When do you need them?



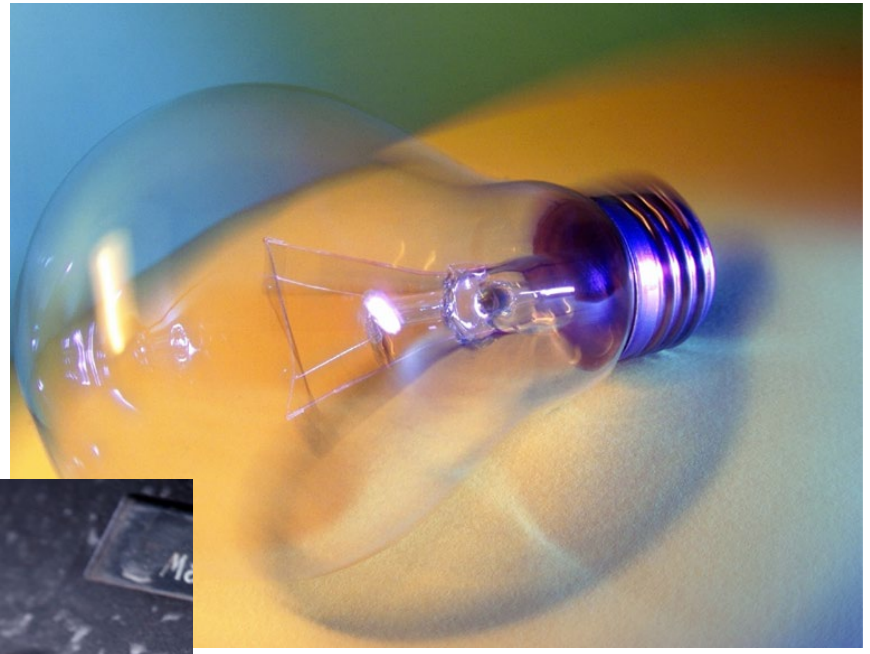
Source: https://thumbor.forbes.com/thumbor/960x0/https%3A%2F%2Fblogs-images.forbes.com%2Fevamurray%2Ffiles%2F2019%2F03%2FExecutive-Sales-Profitability.jpg

Data Translations

- Data – raw, unorganized facts
- Information – the transformation of those facts into meaning
- Knowledge – what to do with it



So how do you turn data into meaningful information?



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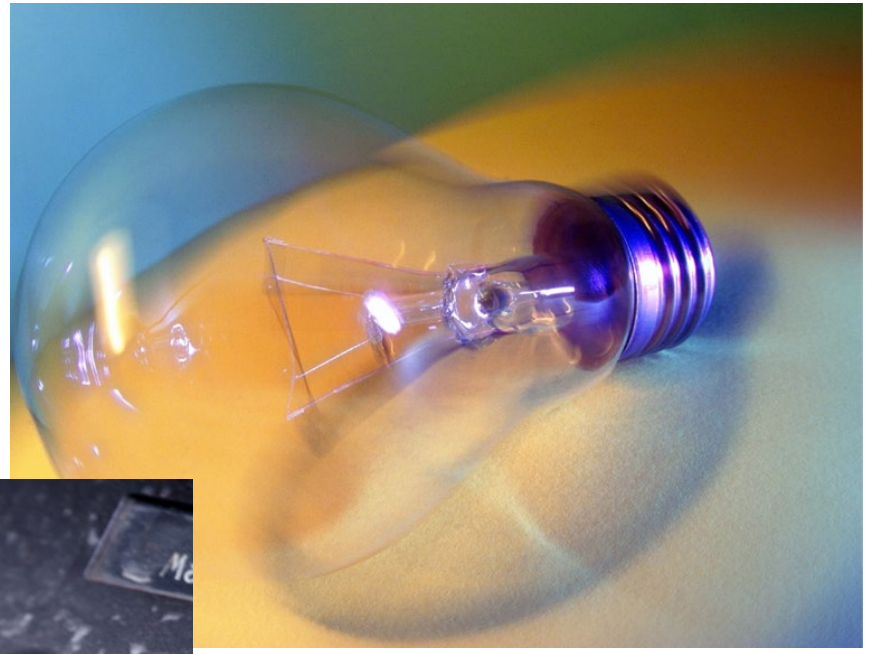


- ask the right question!
- collect the right data
- perform the correct analysis
- interpret the results correctly
- disseminate your results to the correct people/entities

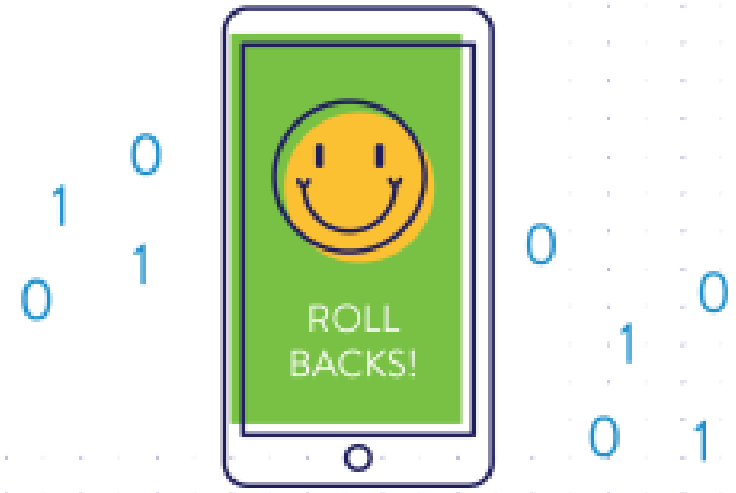
Case Study: Walmart

- Supply Chain Management
- Shopping Experience
- Product Assortment
- Store Checkout

https://corporate.walmart.com/newsroom/innovation/20170807/5-ways-walmart-uses-big-data-to-help-customers

TO PERSONALIZE THE SHOPPING EXPERIENCE

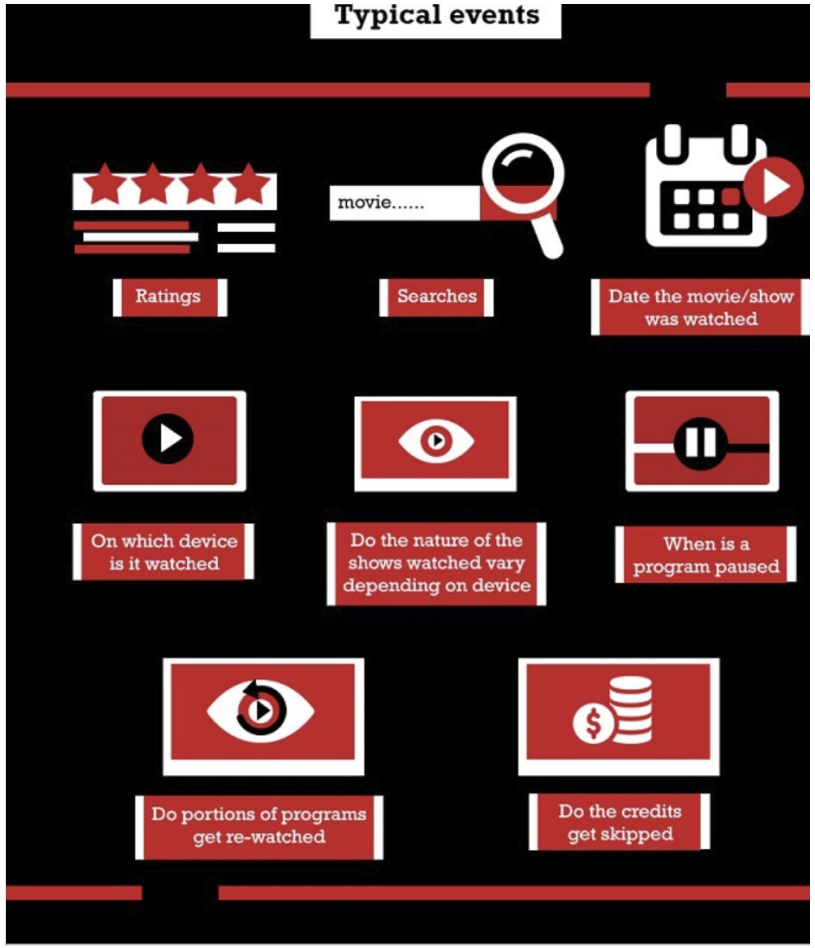
Big data allows Walmart to identify a shopper's preferences to develop a consistent and delightful shopping experience. If a user is shopping for baby products, Walmart can use data analysis to personalize mobile rollback deals for parents and help them live better by anticipating their needs.



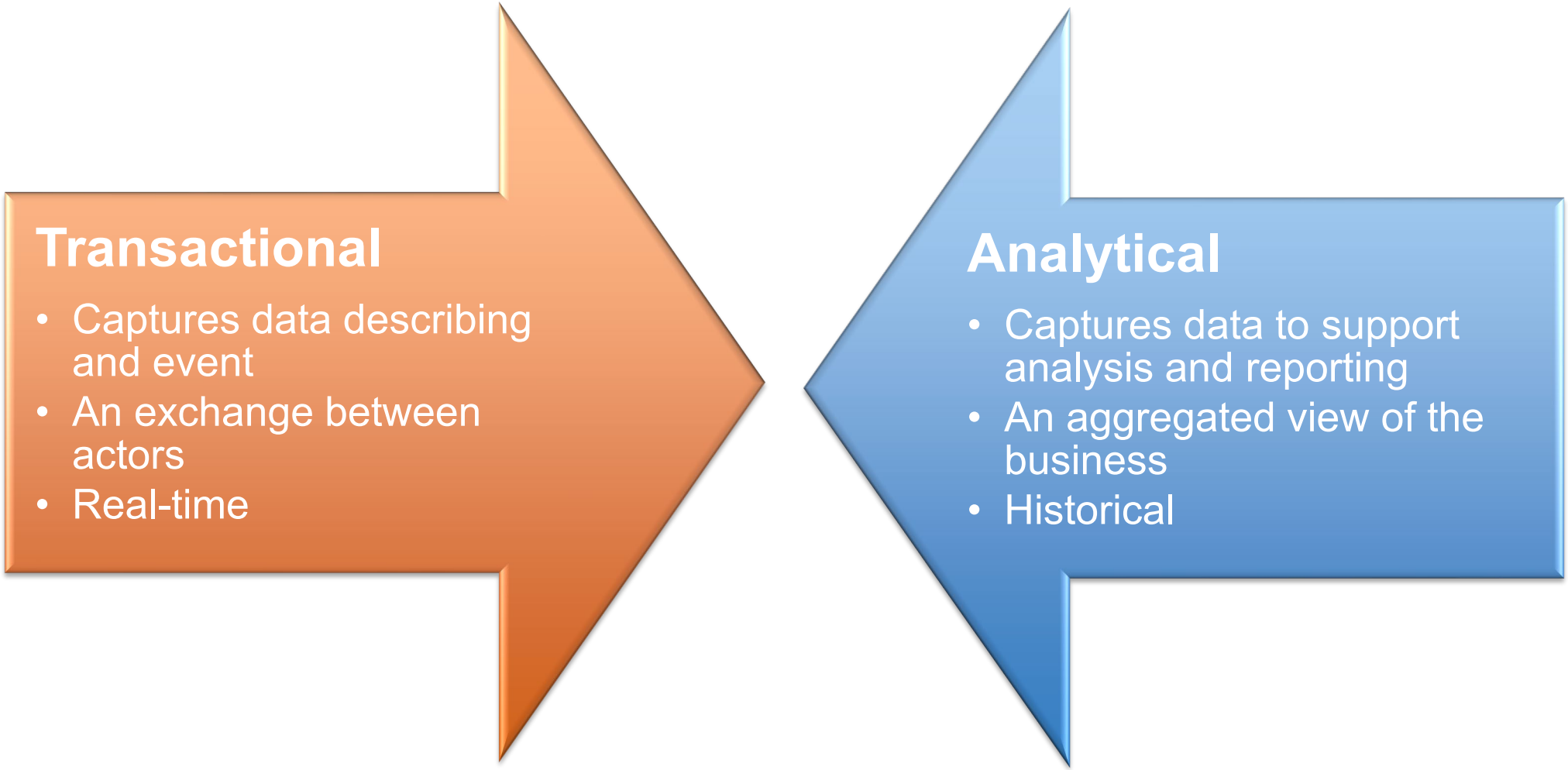
Case Study: Netflix

- 80% of content influenced by recommendation engine
- $1 billion a year saved in customer retention efforts – why?
- Would you consider Netflix a data company?

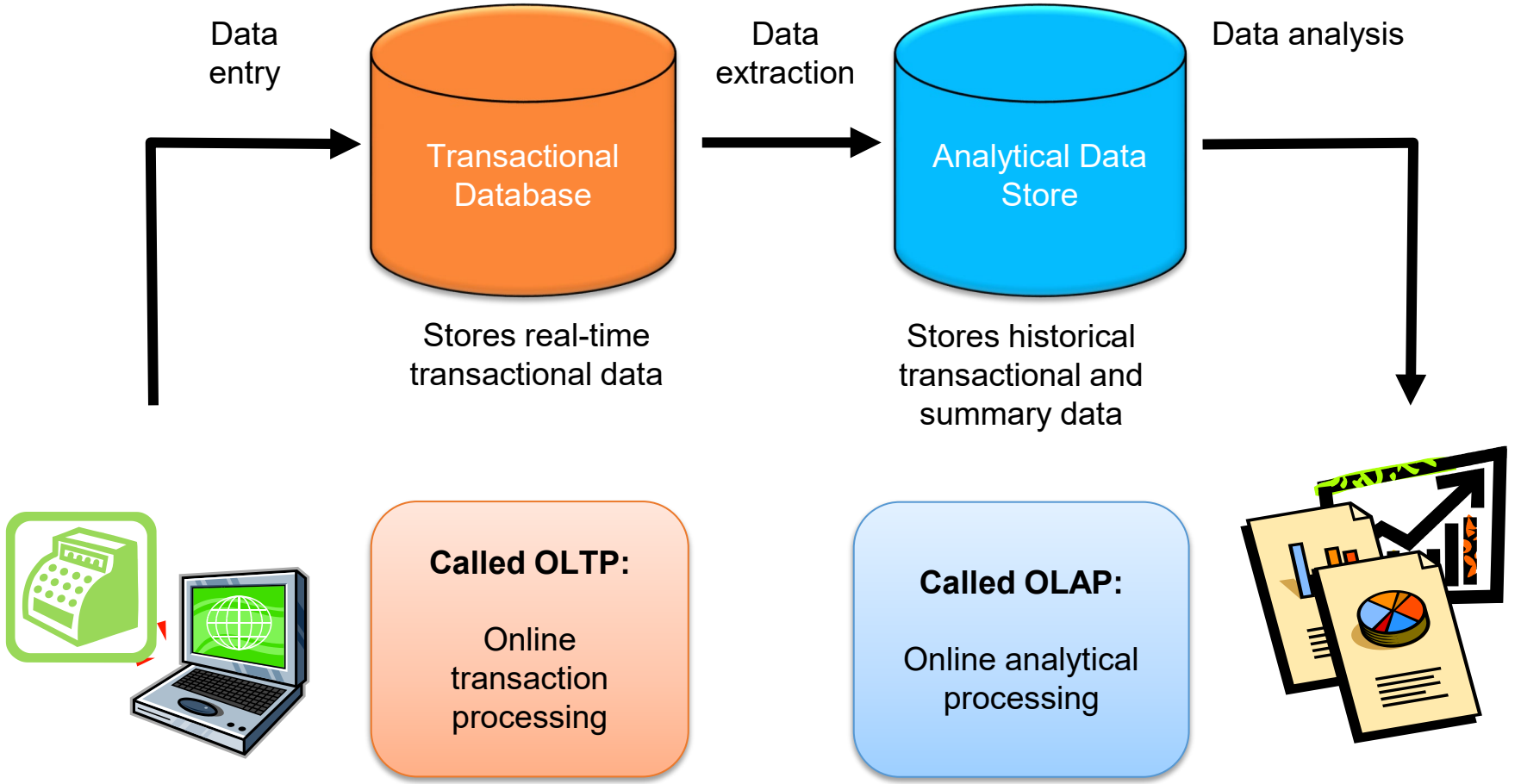
https://seleritysas.com/blog/2019/04/05/how-netflix-used-big-data-and-analytics-to-generate-billions/



Types of Data



The Information Architecture of an Organization



Components of an information infrastructure

- **Transactional Database**
  - **Supports management of an organization's data**
  - **For everyday transactions**
  - **Known as "Database management"**
- **Analytical Data**
  - **Supports managerial decision-making**
  - **For periodic analysis**
  - **The foundation for business intelligence**

Leverage Data and Technology

- Google Analytics
- Excel
- Tableau

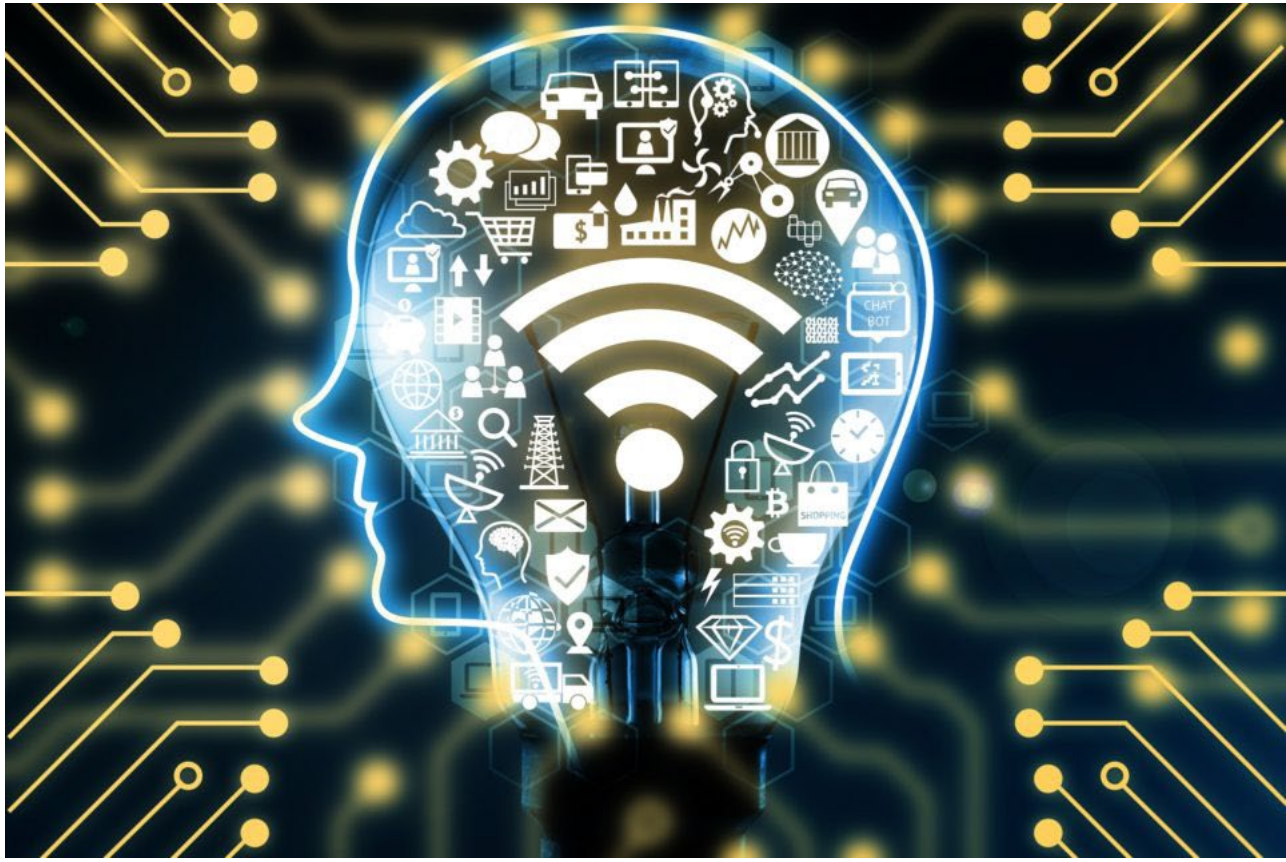
Data Breaches and Ethicality of Data Usage

- Role of Marketing?
- Consumer Rights?
- Organizational Needs?
- Legal Use?
- PRIVACY!

What is Business Intelligence (BI)?

BI Leverages Software & Services to Transform Data

- Mobile BI
- User friendly
- Agile & Intuitive Systems
- Leads to Strategic Business Decisions

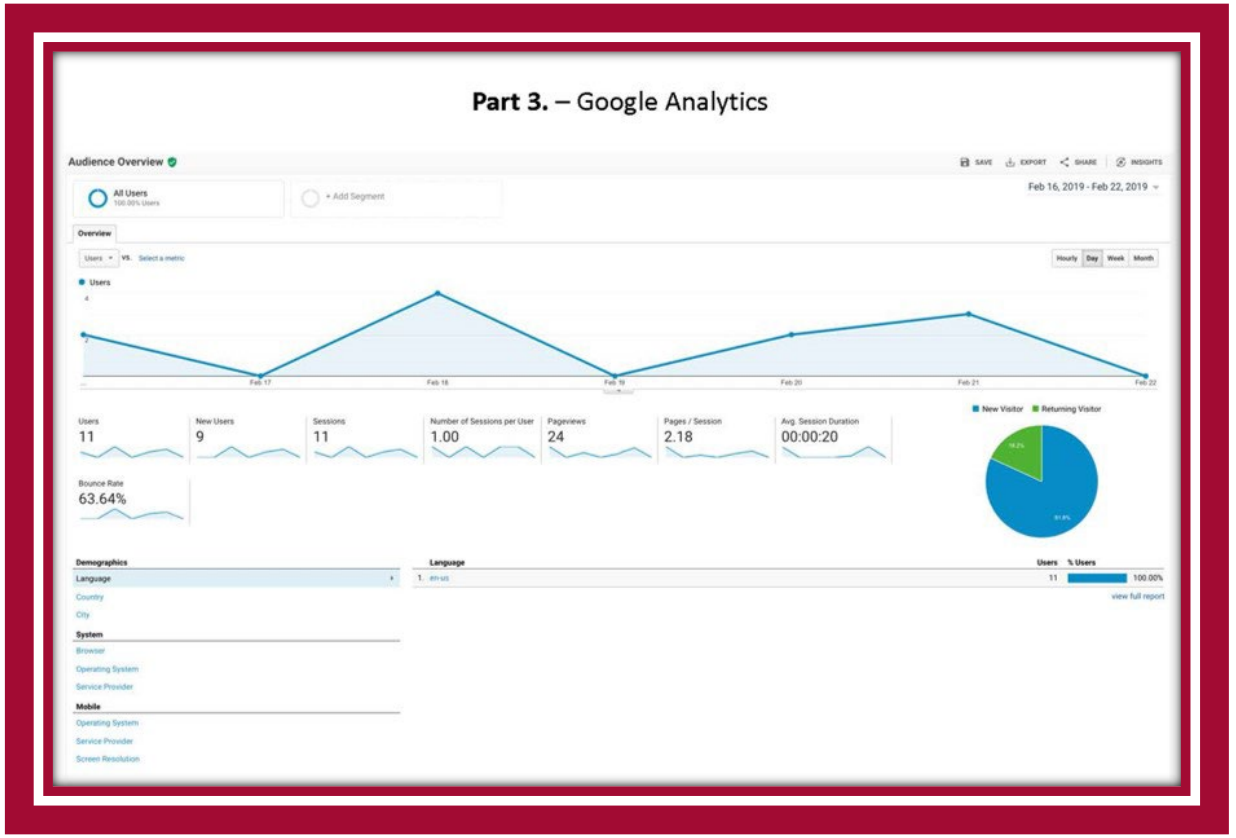


Source: https://blog.radware.com/tag/internet-of-things/page/3/

Google Analytics

What Can We Track?

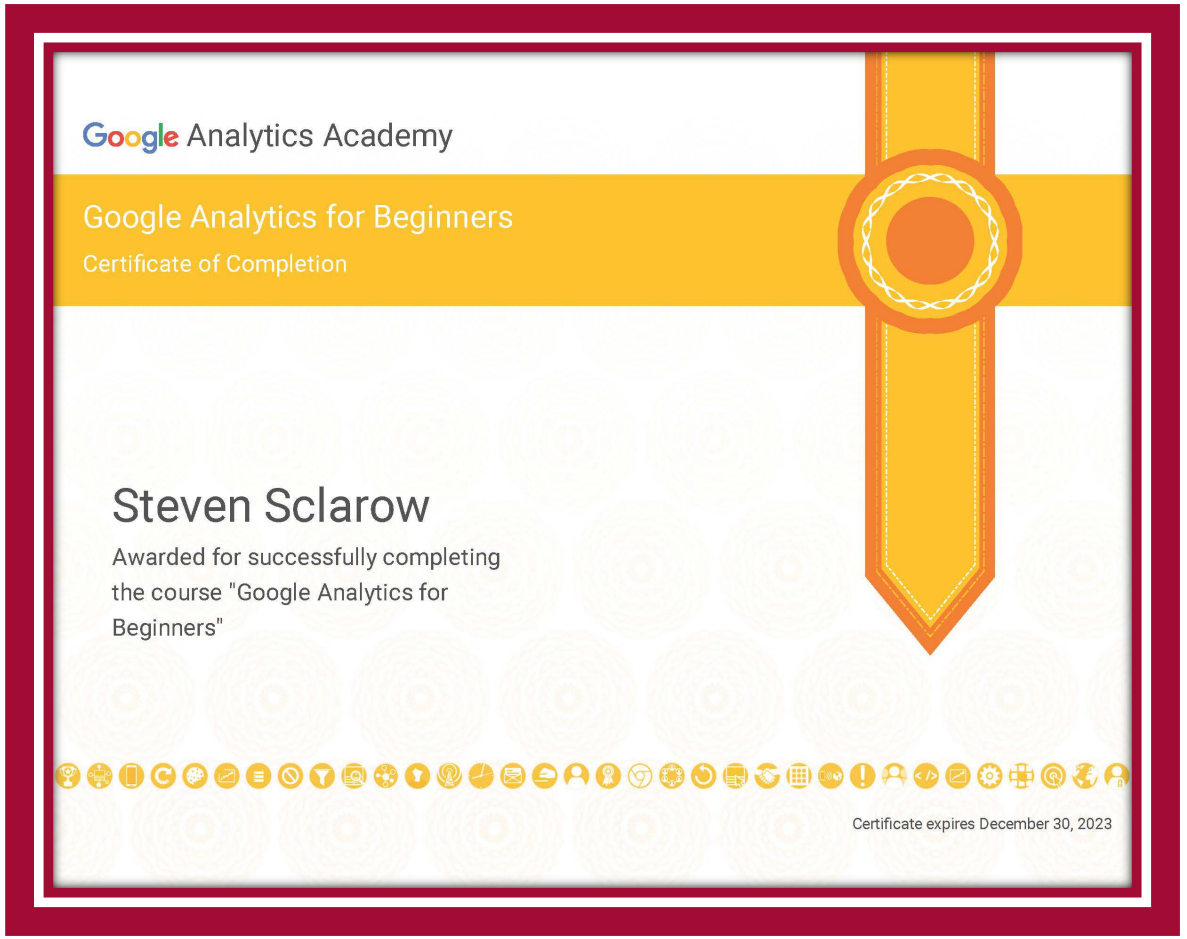
- web site metadata & user engagement
- Number of Sessions
- Average Session Duration (minutes, hours, etc.,)
- Number of pages visited
  - Duration of Each Visit
- Bounce Rate
- Conversion Rate



Learn IT #2

Get Certified!

- Google Analytics for Beginners
  - Complete all four units
  - Score 80% or better on all assessments



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Digital Systems

6.2 Information Systems: Part IV - SCM

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What is Supply Chain Management (SCM)?

Thoughts?

"Supply Chain includes many components…from Procurement to Manufacturing to Distribution."

"SCM is about getting the right product on the right shelf at the right time!"

– Professor Doyle

Source: https://www.chainstoreage.com/wp-content/uploads/2017/06/supplychain.jpg

What is Supply Chain Management (SCM)?

Cross Functional Approach:

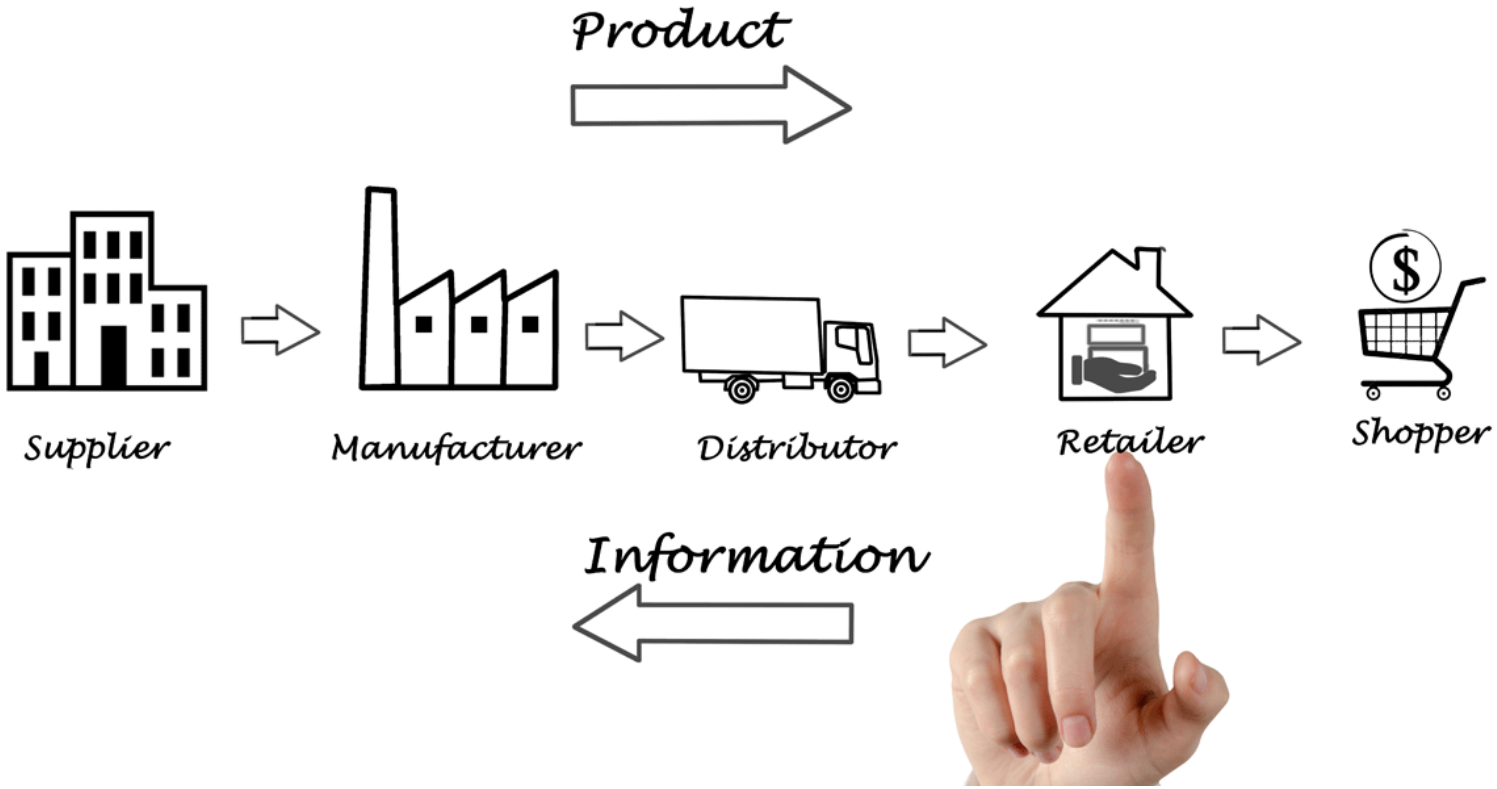
- Improves trust & collaboration
- Improves inventory visibility & velocity
- Reduces Cost
- Increases Revenue

Source: https://www.chainstoreage.com/wp-content/uploads/2017/06/supplychain.jpg

Supply Chain Management

Pick a product

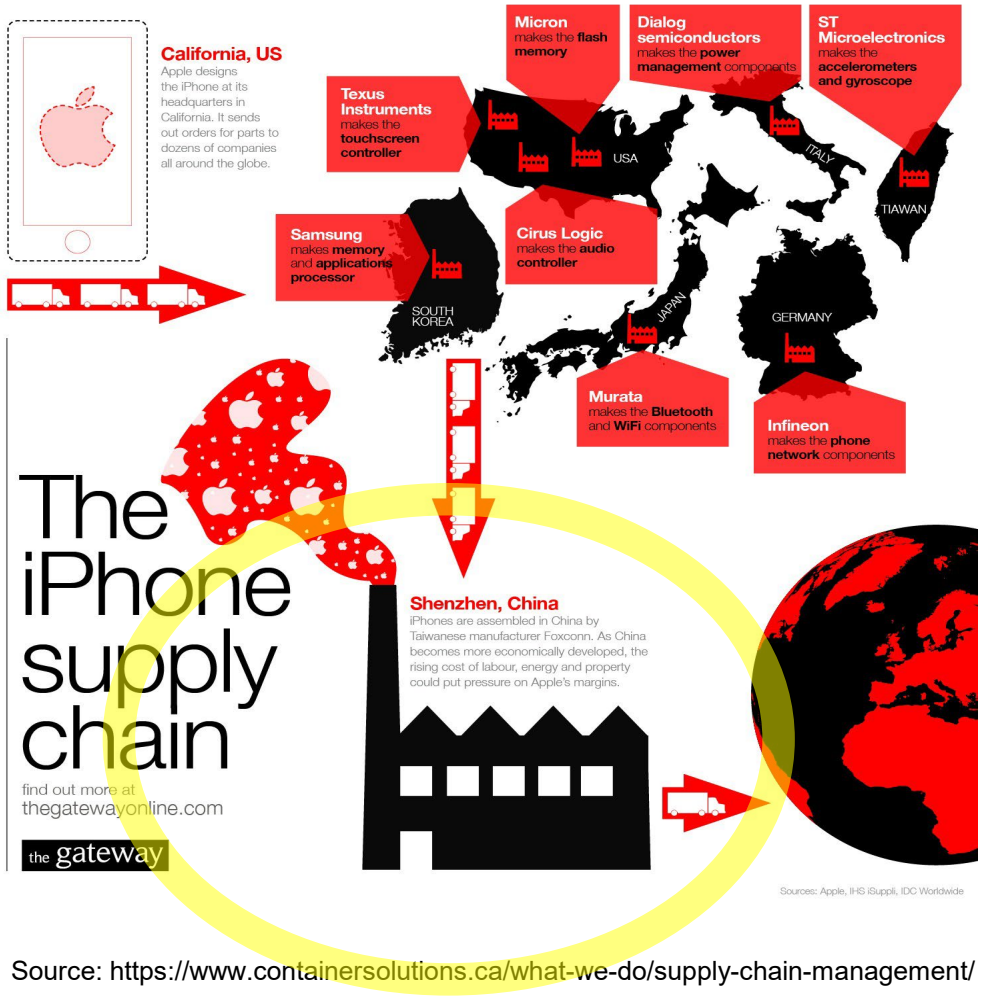
- Who are the key actors?
- What types of materials are involved?
- What about technology?
- What skills are required?
- What's missing?



Source: https://www.containersolutions.ca/what-we-do/supply-chain-management/

Case Study: iPhone Xs

- Where is your iPhone Made?
- What happens in Shenzhen, China if there are any delays?
- How do you plan for problems?
  - Weather
  - Material shortages
  - Strikes

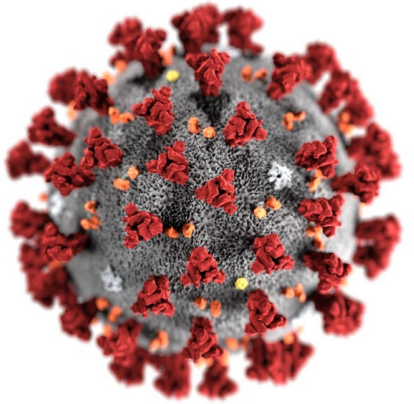


Source: https://www.containersolutions.ca/what-we-do/supply-chain-management/

Supply Chains are Fragile

- Complex ecosystem of partners
- Cost distribution
  - How much value is *really* added by each supplier?
- Balancing inventory & efficiency
- Manual SCM causes issues

COVID Impacts on SCM



- Highlighted SC vulnerabilities
- Global shortages & delays
- Which products were impacted most?
- New SCM priorities going forward
  - Visibility, resiliency, automation

Case Study: Kimberly-Clark

- March 12, 2020: TP sales increased 734%
- Supply shortages, lack of supplier diversity
- Many companies forward-buying
- TP scarce for weeks after initial shortage

Case Study: Kellogg's

- Cereal, noodle & snack sales increased during pandemic
- Relied on several weeks of "safety stock"
- Quickly shifted packaging suppliers
  - Korean supplier → New Zealand supplier

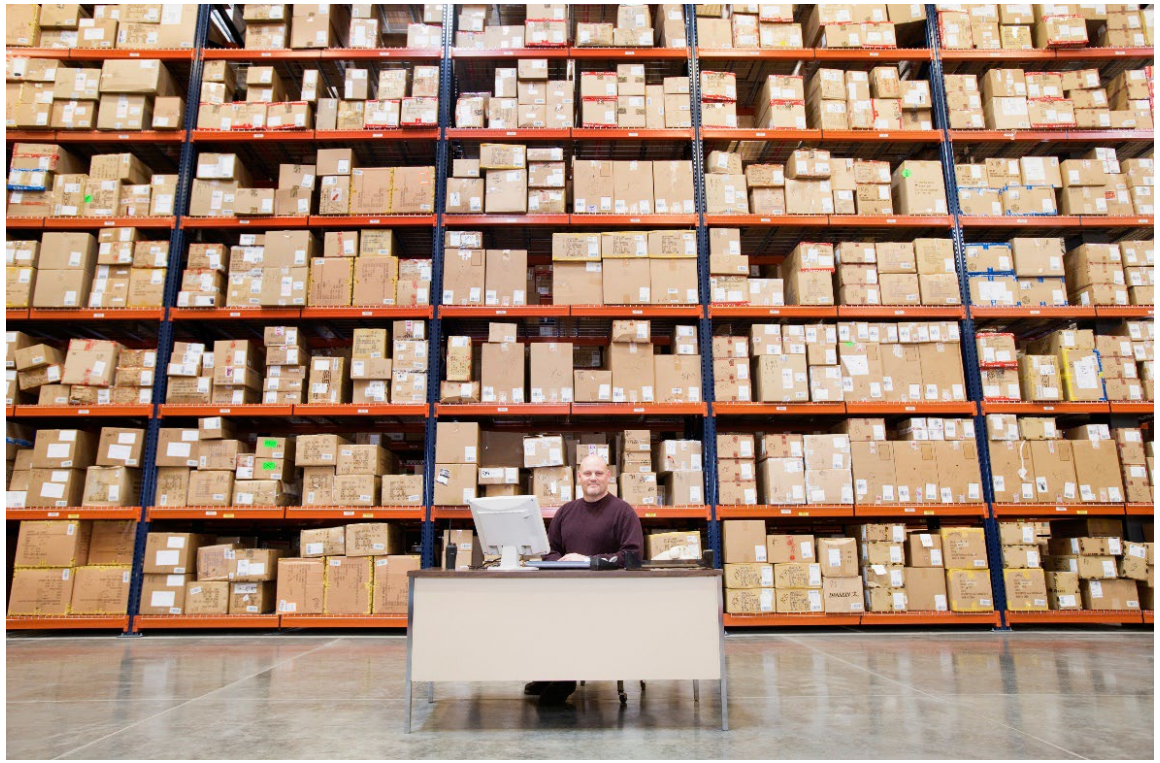
SCM Discussion

- Who works for a company which manufactures a product?
- What kind of product is it?
- What stuff do you need to make your product?
- Where do you get this stuff?
- What happens if they run out of this stuff?

Source: https://www.neurored.com/wp-content/uploads/2018/01/supply-chain-smartification-1030x824.png

Safety Stock – That's the Answer!!!

- What people in fulfillment see…



- What people in Accounting see…

Supply Chain Optimization

Two approaches for Supply Chain Management:

1. Plan to Work Backwards

- DEMAND

2. Project Execution

- Efficient flow of products, information, & financing

Source: https://liquidplanner-wpengine.netdna-ssl.com/wp-content/uploads/2019/04/Supply-Chain-graphic.jpg

What is RFID

What is RFID?

- Radio Frequency Identification
- Wireless technology that lets you identify objects that have been fitted with special RF identification tags

What is RFID good for?

- Inventory control, access control…

How it works

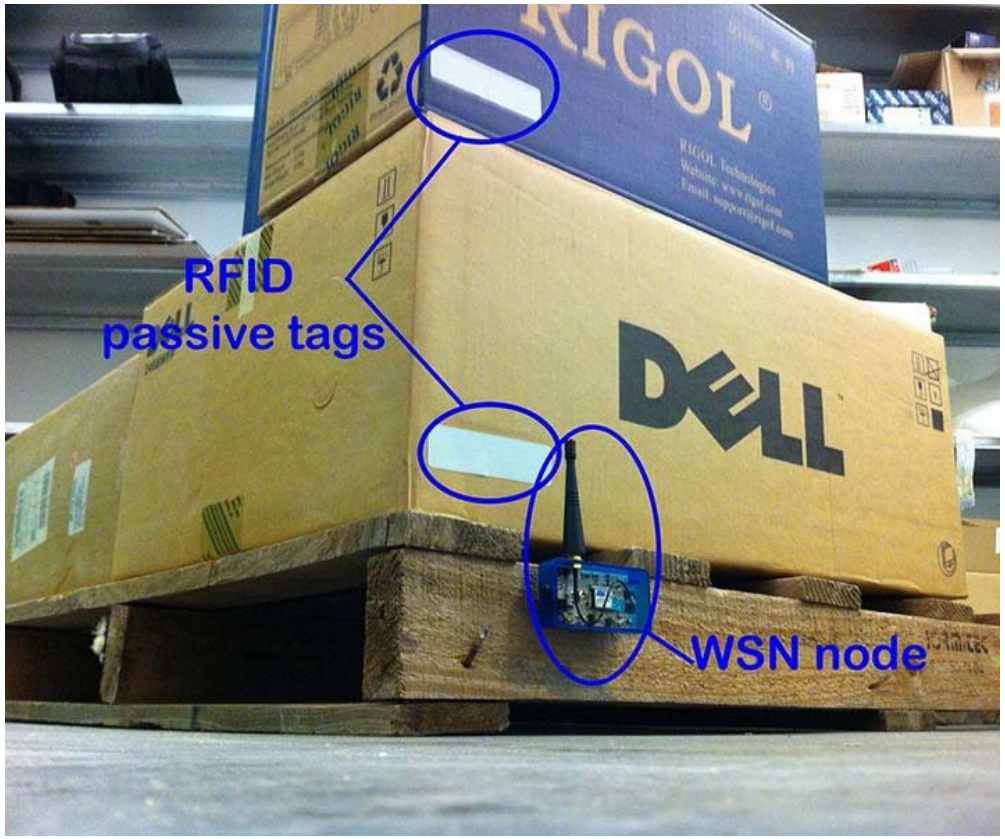
- Antenna reads electromagnetic energy
- Can penetrate non-metallic solid objects

Source: https://journals.ala.org/index.php/ltr/article/viewFile/4514/5301/6514

RFID explained

The use of electromagnetic energy to transit energy between a reader (transceiver) and the tag (antenna).

- ✓ **RFID tags can contain more information than bar codes.**
- ✓ **Tags are programmable**
- Scanning can be done from greater distance.
- Passive tags—inexpensive, range of few feet.
- Active tags—more expensive, longer range



Source:_https://www.researchgate.net/profile/Jose_San_Jose_Vieco/publication/261430560/figure/fig1/AS:564991784742913@1511715946690/WSN-Node-and-RFID-tags-in-a-pallet.png

Case Study of RFID: Disney Magic Band

Why Did Disney Invest $1 Billion?

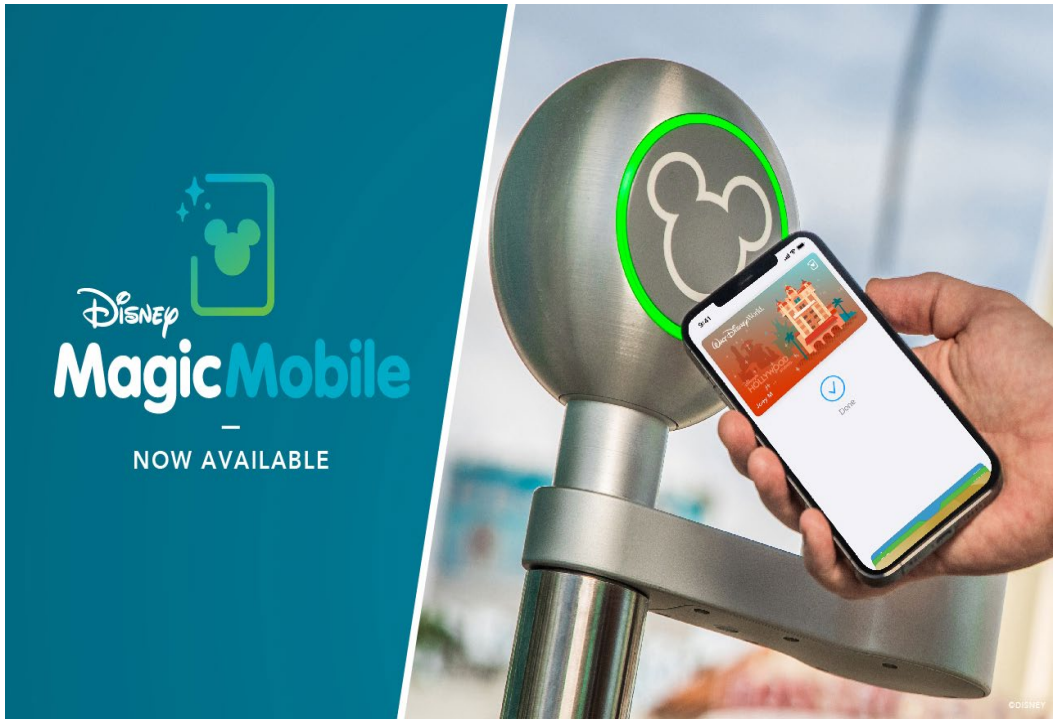
- Marketing Opportunities
- UX & CX
- Patron Tracking
  - Multiple Parks
  - Hotels
- Endless Possibilities!

Source:_https://media.wired.com/photos/593275a15c4fbd732b552d4a/master/w_1200,c_limit/disneymagicband2_f.jpg

Case Study of RFID: Disney Magic Band

Was the $1 Billion investment wasted?

- Disney will no longer offer Magic Bands included with park pass
- Magic Band features transferred to cell phones
- What are the pros/cons of this decision?



More to Come

Prepare with Readings & Videos before our next class!!!