



# Digital Systems

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6.1 Information Systems Part II – Data Analytics and SCM

**FOX**  
**MIS**

# Attendance

Please login to Canvas and “Check-In”

Attendance is not a part of your grade for this class. The university has mandated that we take attendance for all classes, face-to-face, online and hybrid, to assist in contact tracing should an outbreak of Covid-19 occur.

**FOX**  
**MIS**

# ROADMAP

START

## Week 1:

### Introduction & Systems Analysis

- Course Description
- Systems Thinking

## Week 2:

### Introduction to Process Mapping

- Systems & Processes
- Swim Lane Diagrams

Assignment #01

## Week 3:

### Digital Product Management

- Max Labs 1a & 1b
- Entity Relationship Diagrams (ERD)

Assignment #02

## Week 4:

### Introduction to Data Modeling

- ERD Diagrams
- Learn IT Kickoff

Assignment #03

## Week 5:

### Exam #1 & Information Systems – Part I & II

- CRM & ERP

\*Exam – check calendar

## Week 9:

### Exam #2 & JavaScript Unit #1 - Part I & II

- Hello World, Variables
- \* Exam - check calendar

Assignment #07

## Week 8:

### Cybersecurity & AI – Part I & II

- Protection Protocols
- Artificial Intelligence

Assignment #06

## Week 7:

### Platforms & Digital Business Models – Part I & II

- Platforms & Digital Models
- APIs

Assignment #05

## Week 6:

### Information Systems – Part III & IV

- Data Analytics
- SCM
- Max Labs 2a2b

Assignment #04

## Week 10:

### JavaScript Unit #2 Functions

- Operator types
- Strings

Assignment #08

## 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

Assignments #'s 9 & 10

FINISH



### Ngoc Nathan Pham

Major: BBA MIS

Graduation: May 2019



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### Professional Achievements

AWARDS 4 +

WORK EXPERIENCE 3 +

PROJECTS 2 +

PARTICIPATION 21 +

ATTENDANCE 5 +



Major: Management Information Systems

Minor: Finance

Graduation: May 2019

Cumulative GPA: 4.0/4.0

My name is Ngoc "Nathan" Pham, a "sociable nerd" who loves connecting with people, learning constantly, and exploring technologies every day. I'm finishing my undergraduate degree at Fox School of Business, Temple University (Philadelphia, PA).

I have had experience in Risk Advisory, Data Analytics (R, Excel, Tableau, and SQL), PHP/JavaScript Web Application Development, Equity Research, Investment Banking, and Commercial Banking. This past summer, I worked as a **Technology Risk Advisory Intern** at Deloitte in Philadelphia.

At Temple, I love helping people through my role as a Peer Mentor for 141 Temple freshmen from 11 countries over the past 3 years. I also enjoy learning, researching, and reflecting on something new every day.

My long-term career goal is to succeed in management consulting to help organizations and individuals achieve their potential.

Thank you for visiting my site. Feel free to explore more about my professional and personal interests. My resume and LinkedIn profile are listed below:

- Nathan Pham's Resume
- Nathan Pham's LinkedIn profile

### Leave a Reply

Logged in as Brien Coghlan. Log out?  
Comment

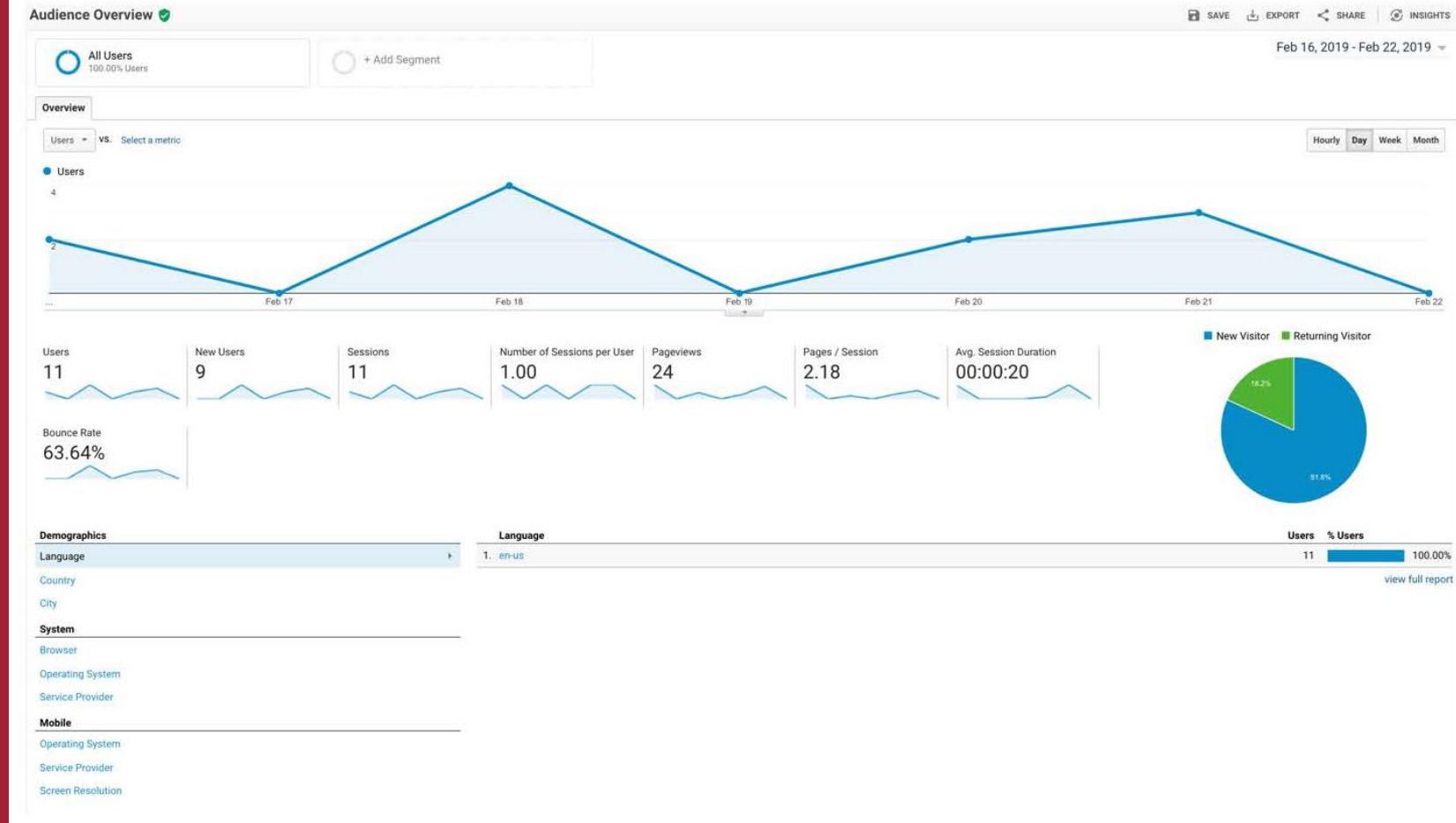
Learn IT! #1 & #2



# Learn IT! #1 & #2

**FOX**  
**MIS**

## Part 3. – Google Analytics



Who has created some data  
already today?

# What better way to start a unit on 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 5 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 <sup>(1)</sup>



## 1.7 MB

of new information will be created every second for every human being on the planet. <sup>(2)</sup>



## 50 BN

smart connected devices <sup>(3)</sup> in the world, all developed to collect, analyze and share data.



## 3RD

of all data <sup>(4)</sup> will pass through the cloud.



## \$65 MN

additional net income <sup>(5)</sup> will be the result of just 10% increase in data accessibility for a typical Fortune 1000 company



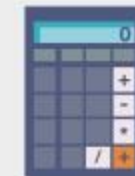
## 60%

of information delivered to decision makers will be considered by them always actionable, doubling the rate from the current (2015) level. <sup>(6)</sup>



## 50%

of all business analytics software will incorporate prescriptive analytics built on cognitive computing functionality. <sup>(6)</sup>



## 90%

of databases will be based on memory-optimized technology. <sup>(6)</sup>

THE INDUSTRIES DRIVING MUCH OF THIS GROWTH INCLUDE:

BANKING

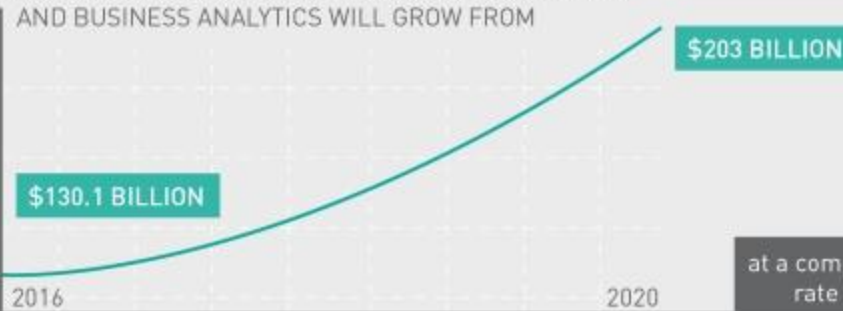
MANUFACTURING

GOVERNMENT

PROFESSIONAL SERVICES

These will remain the top five industries through 2020 <sup>(7)</sup>

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



at a compound annual growth rate (CAGR) of 11.7%.







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.



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](https://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 STOLT, REDDIT, USER, AMAZON, VOX



# How does **data** influence ...

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

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.



# 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

## Two Types of Analytics:

- Descriptive
- Predictive



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

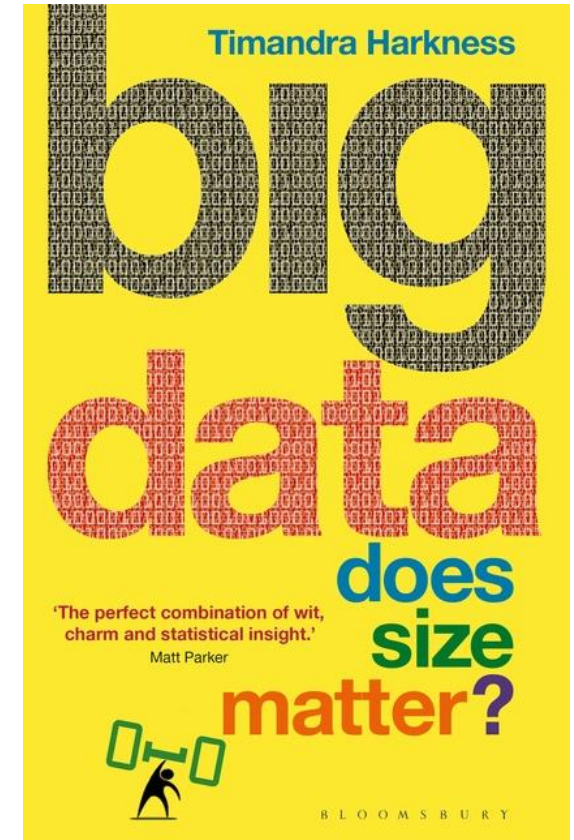
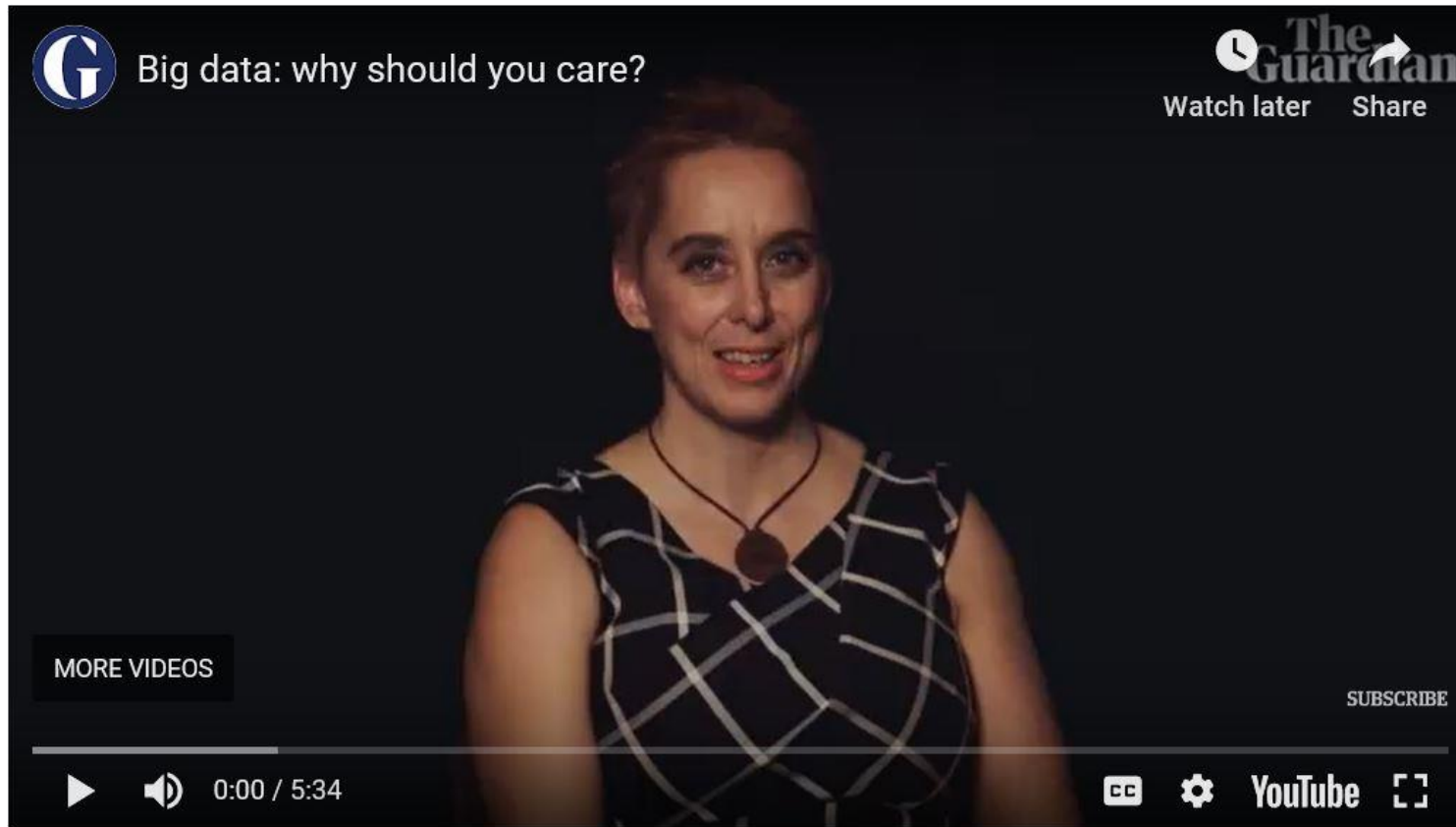
**“Analytics is the process of making sense of large data sets and unlocking patterns, often using data visualization, to enable better decision making.”**

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- Professor Amy Lavin



# What is Big Data...Why Care?



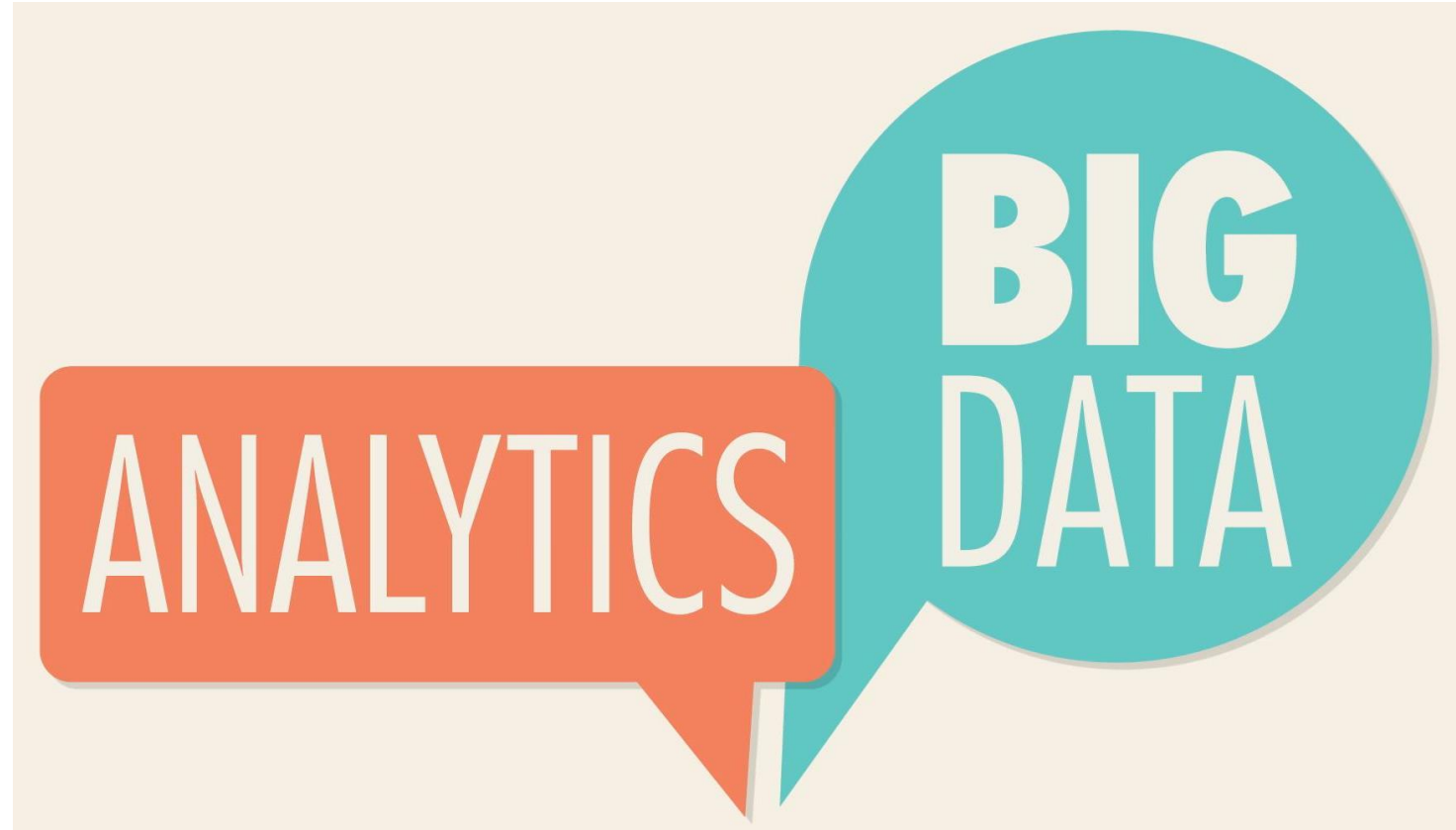
Source: <https://www.bloomsbury.com/uk/big-data-9781472920065/>

# Data Investments...Why Care?

## Top Reasons Why:

- Decrease Expenses
- Find New Innovations
- Launch New Products/Services
- Increase Efficiency
- Transform Business
- Establish Data-Driven Culture

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



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

# Big Data & Mickey D's

## \$300 Million Acquisition

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

## Predictive Analytics?



Source: KIYOSHI OTA/BLOOMBERG/GETTY IMAGES

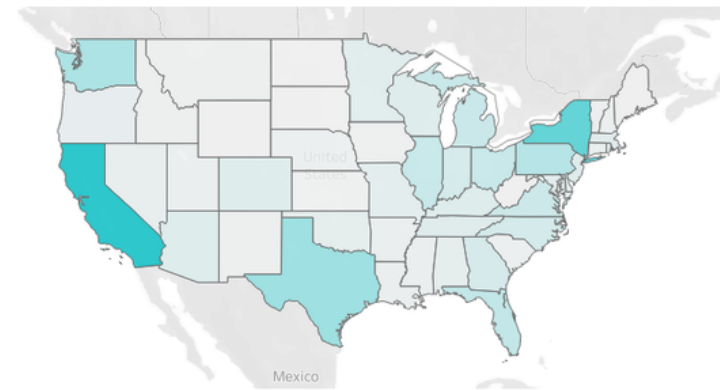


# What can data do for you?

## 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?

### SALES & PROFITABILITY



Phones	\$330,007
Chairs	\$328,449
Storage	\$223,844
Tables	\$206,966
Binders	\$203,413
Machines	\$189,239
Accessories	\$167,380
Copiers	\$149,528
Bookcases	\$114,880
Appliances	\$107,532
Furnishings	\$91,705
Paper	\$78,479
Supplies	\$46,674
Art	\$27,119
Envelopes	\$16,476
Labels	\$12,486
Fasteners	\$3,024

### SALES & PROFIT BY CATEGORY



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



# OLTP vs. OLAP

## OLTP: Transactional –

- Provides source data to the data warehouse

## OLAP: Analytical

- Systems help analyze the data

The following table summarizes the major differences between OLTP and OLAP system design.

	<b>OLTP System Online Transaction Processing (Operational System)</b>	<b>OLAP System Online Analytical Processing (Data Warehouse)</b>
Source of data	Operational data; OLTPs are the original source of the data.	Consolidation data; OLAP data comes from the various OLTP Databases
Purpose of data	To control and run fundamental business tasks	To help with planning, problem solving, and decision support
What the data	Reveals a snapshot of ongoing business processes	Multi-dimensional views of various kinds of business activities
Inserts and Updates	Short and fast inserts and updates initiated by end users	Periodic long-running batch jobs refresh the data
Queries	Relatively standardized and simple queries Returning relatively few records	Often complex queries involving aggregations
Processing Speed	Typically very fast	Depends on the amount of data involved; batch data refreshes and complex queries may take many hours; query speed can be improved by creating indexes
Space Requirements	Can be relatively small if historical data is archived	Larger due to the existence of aggregation structures and history data; requires more indexes than OLTP
Database Design	Highly normalized with many tables	Typically de-normalized with fewer tables; use of star and/or snowflake schemas
Backup and Recovery	Backup religiously; operational data is critical to run the business, data loss is likely to entail significant monetary loss and legal liability	Instead of regular backups, some environments may consider simply reloading the OLTP data as a recovery method

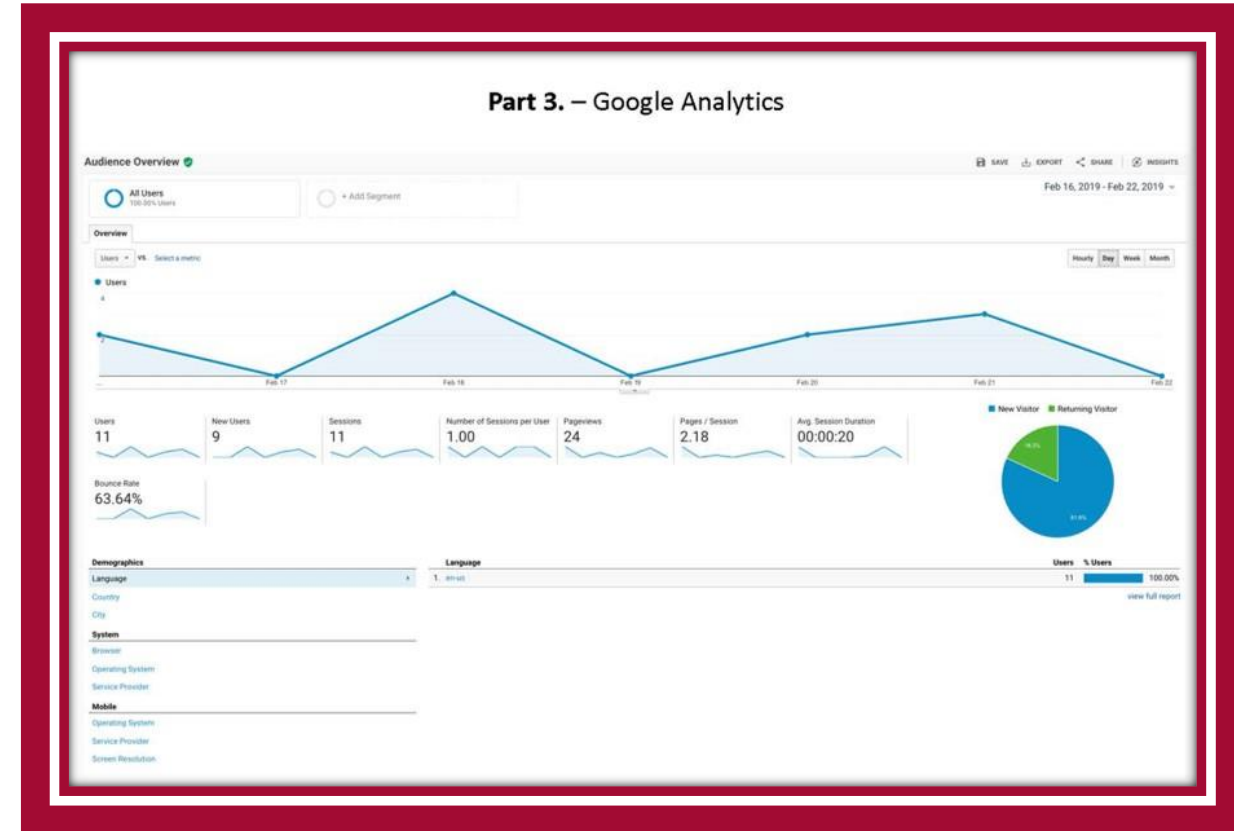
source: [www.rainmakerworks.com](http://www.rainmakerworks.com)

Source: <http://datawarehouseuser.com/2007/06/OLTP-vs-OLAP/>

# 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



# What is Supply Chain Management (SCM)?

## Thoughts?

“Supply Chain includes many components...from Procurement to Manufacturing to Distribution. It’s about getting the right product on the right shelf at the right time!” – Professor Doyle

## Cross Functional Approach:

- Improves trust & collaboration
- Improves inventory visibility & velocity



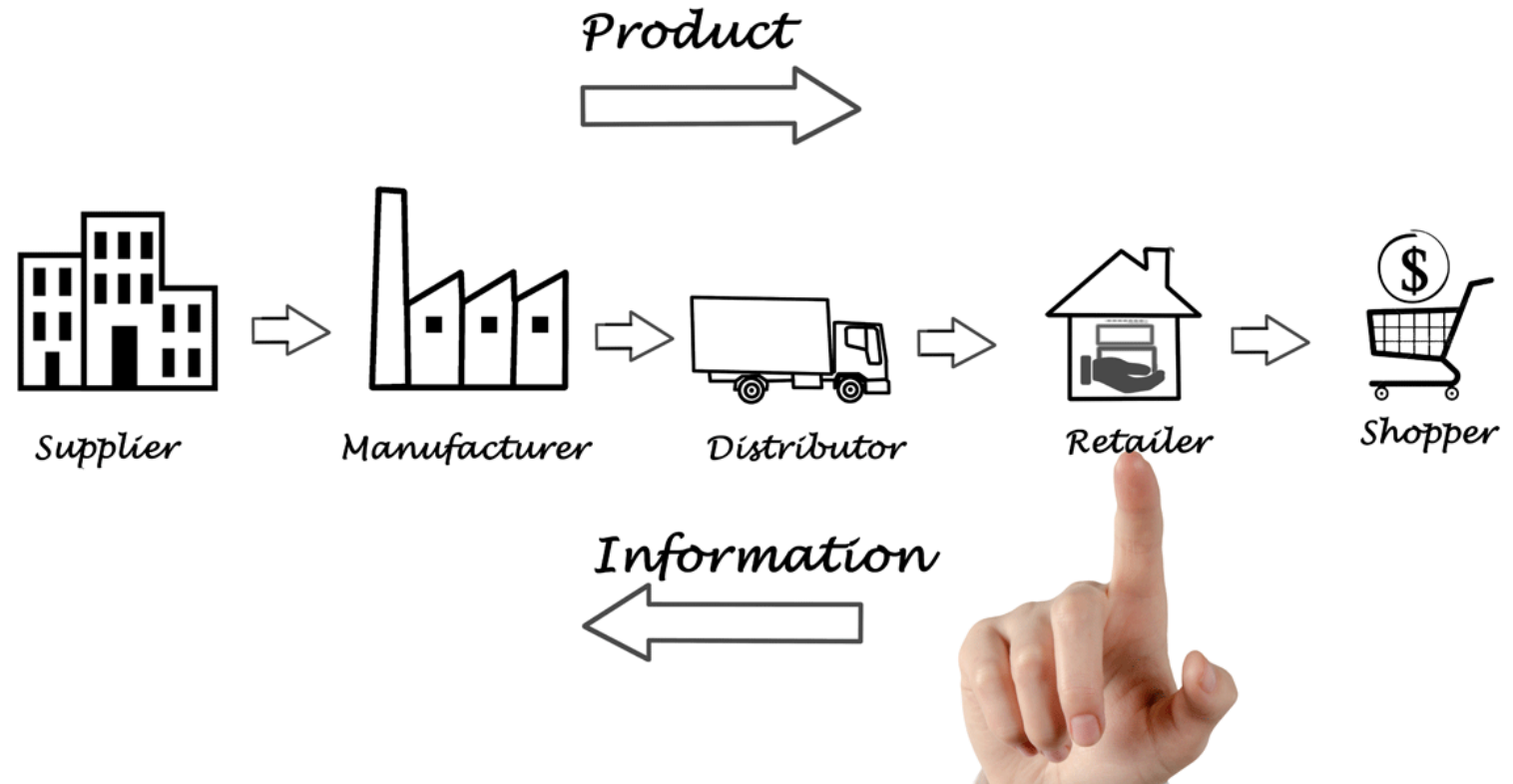
Source: <https://www.chainstorage.com/wp-content/uploads/2017/06/supplychain.jpg>



# Supply Chain Management...

## Pick a product

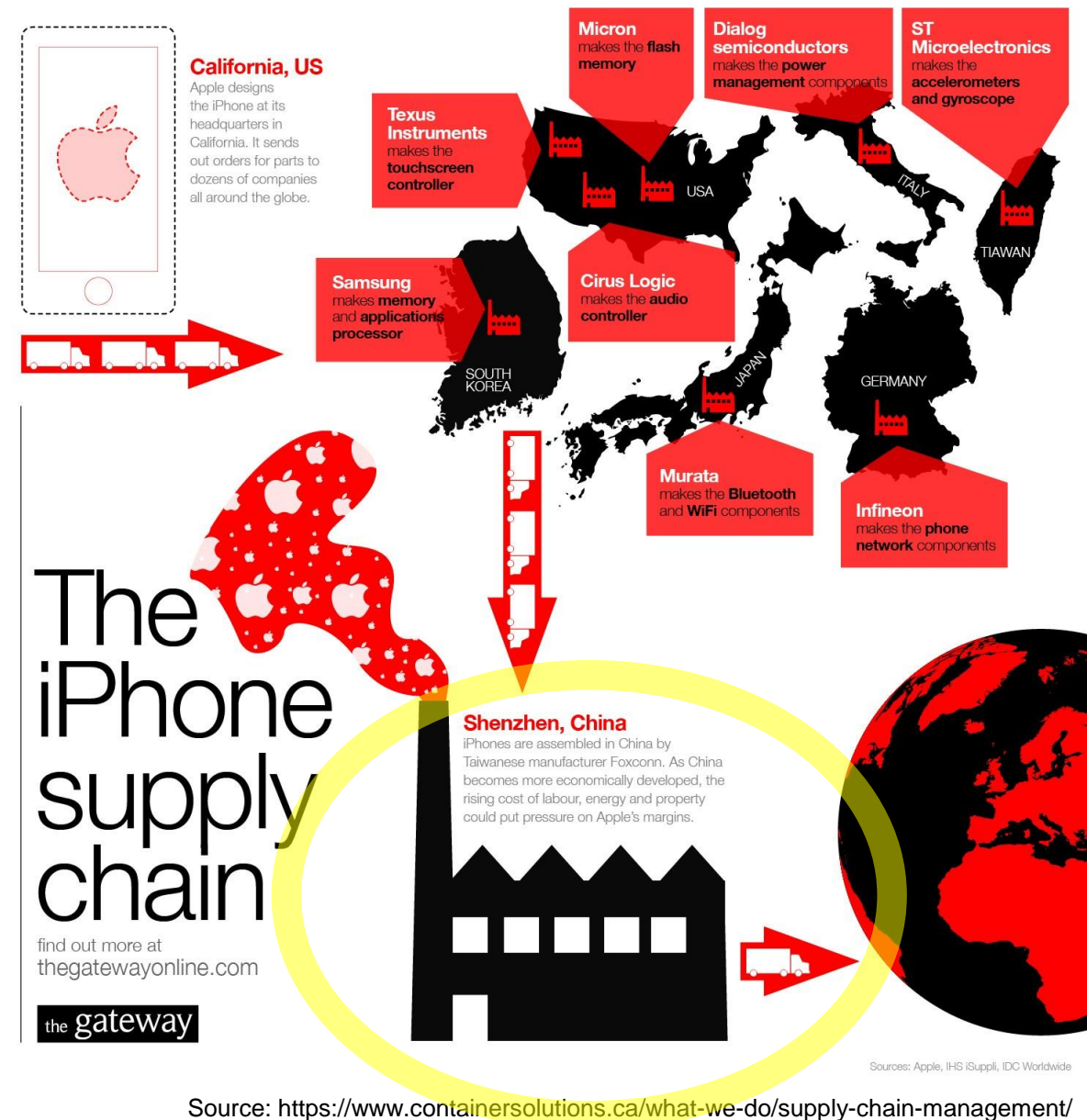
- Who are the key actors?
- What types of materials are involved?
- What about technology?
- What skills are required?
- What's missing?



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/>

# 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...



# What else could you do with this cash?

## What do our accounting friends tell us?

Mythical Company, Inc.

### BALANCE SHEET

Property, plant, and equipment		
Less accumulated depreciation		
<b>Total</b>		
<b>Other Assets</b>		
Long-term cash investment		
Equity investments		
Deferred income taxes		
Other assets		
<b>Total</b>		
<b>Total Assets</b>	<b>\$644,250</b>	<b>100.0%</b>
<b>Total Owner Equity [F]</b>	<b>\$400,250</b>	<b>62.1%</b>
<b>Total Liabilities + Owner Equity</b>	<b>\$644,250</b>	<b>100.0%</b>

	% of Assets
\$75,000	11.6%
\$14,500	2.3%
\$10,000	1.6%
\$8,000	1.2%
<b>\$107,500</b>	<b>16.7%</b>
\$92,500	14.4%
\$34,000	5.3%
\$6,000	0.9%
\$4,000	0.6%
<b>\$136,500</b>	<b>21.2%</b>
\$244,000	37.9%

Source: <https://www.dhresource.com/webp/m/0x0s/f2-albu-g7-M00-00-25-rBVaSVu7R-iANMDzAAP6nmYGKS4175.jpg/alec-monopoly-cash-is-king-home-decor-hd.jpg>

# Supply Chain Optimization

Two critical support functions:

## DEMAND

- Plan to Work Backwards
  - Supply Chain Planning

## EXECUTION

- 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

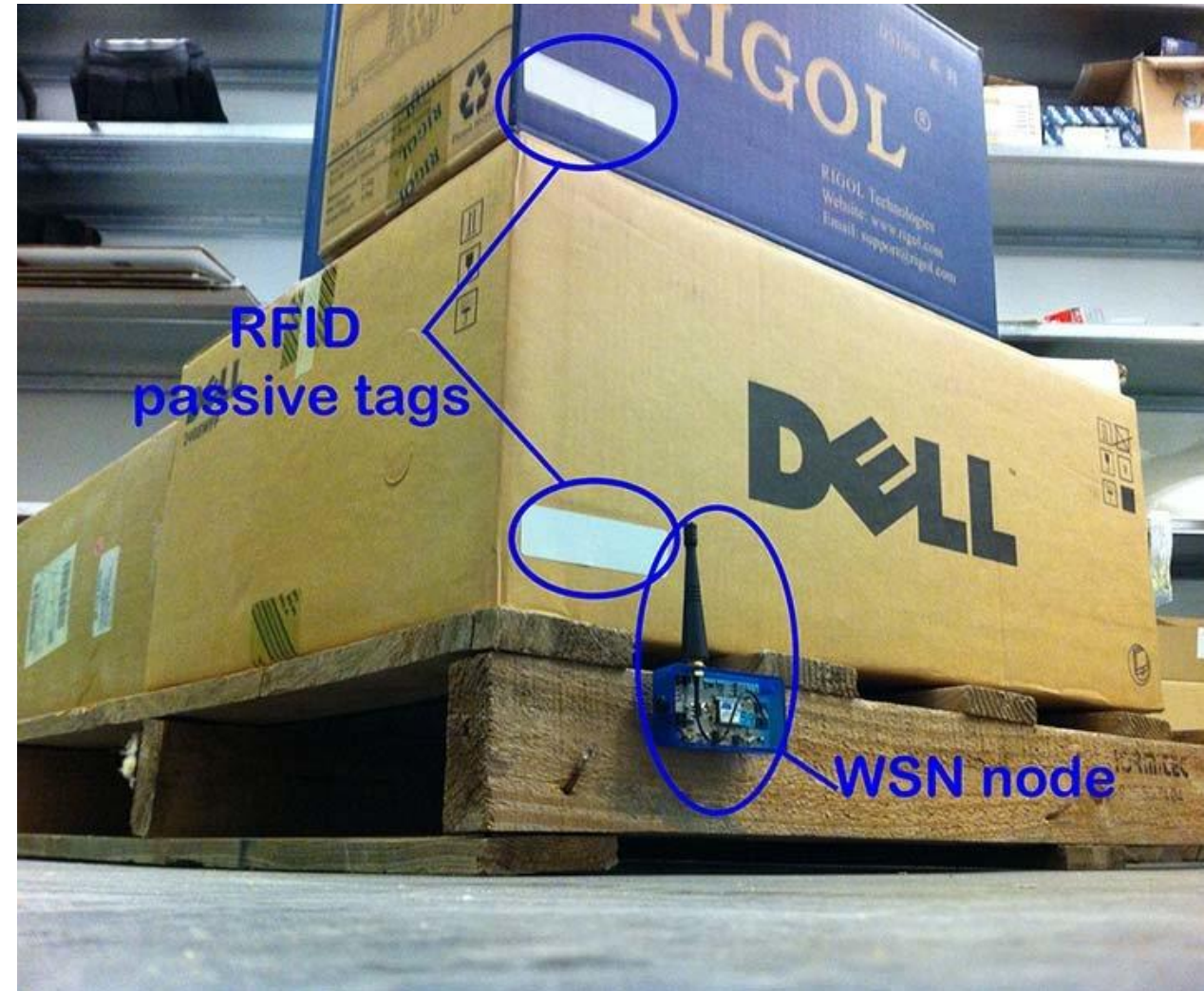


Source: <https://journals.ala.org/index.php/ltr/article/viewFile/4514/5301/6514>

# 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](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: 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](https://media.wired.com/photos/593275a15c4fbd732b552d4a/master/w_1200,c_limit/disneymagicband2_f.jpg)

# More to Come

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