

Database Systems:

Module 12, Lecture 2 – Big Data Facts

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Big Data Facts

LESSON OBJECTIVES

- To be able to describe the "Big Data" Phenomenon that is currently taking place in the marketplace
- Describe the impact Big Data is having on database technology

Big Data Facts

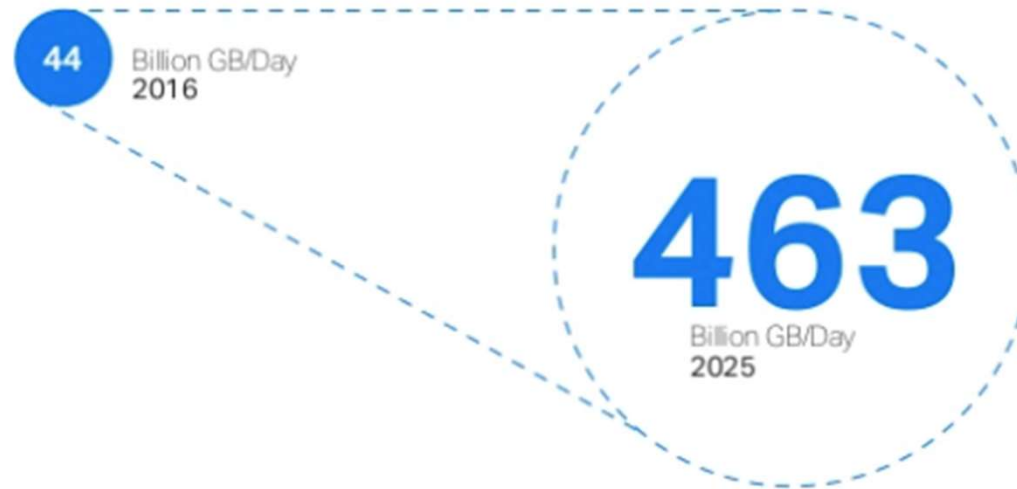
A Few Amazing Facts

- Annual global IP (internet) traffic passed the zettabyte threshold by the end of 2016, beginning the "Zetabyte" era.
(A zettabyte is 1,000,000,000,000,000,000,000 [10^{21}] bytes (a sextillion bytes, or a trillion gigabytes...))
- Smartphone app traffic over the internet exceeded PC traffic in 2016.
- Traffic from wireless and mobile devices accounted for two-thirds of total IP traffic in 2020.
- The number of devices connected to IP networks surpassed more than three times the global population in 2020.
- Between 25-40% of all internet traffic is video data
- In North America, during peak bandwidth consumption hours (around 8 PM). Netflix uses about 40% of total network bandwidth. (80MM subscribers)

Big Data Facts

Global Data Created Each Day

44 billion GB of data was created per day in 2016.



+ IDC predicts growth to **463 billion GB** of data created per day in 2025

Big Data Facts

What is driving this data explosion?

- Smart Phones
- Apps
- The Internet of Things
- Digital Commerce
- Online Entertainment
- Cloud Computing
- Social Media

“Social media facilitate the most intimate of discussions among users, who seem to forget that they’re communicating on a public forum.”

Christopher Surdak, Data Crush

Big Data Facts



"On the Internet, nobody knows you're a dog."

©The New Yorker Collection 1993 Peter Steiner
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Big Data Facts

Smart Phones

- The mobile phone has become the individual's dominant point of interaction with society
- Smartphones -- The first iPhone came out in January 2007
- In 2010, 4.5 B people owned a mobile phone
- By 2017, there were 6.8 B mobile phone users (90% of humanity)
Of which 2.5 B were "smartphones"
- By 2023, there are about 7.3 B mobile phone users and roughly 6.92 billion smartphone users across the world. That's about 91% of the global population, as of 2023.
- 59.16% of IP traffic comes from mobile devices, as of 2022.

Big Data Facts

Apps

- The smartphone “app” concept is about 15 years old
- Apple started selling apps in 2008, with 500 apps
- In 2020, there were 20 million registered iOS developers
- In 2020, there were 500 million weekly visitors to the App Store
- IOS apps – 32 B downloads in 2022
- Android apps – 87 B downloads in 2022
- By 2023 – combined downloads = 142 B
- Google Play provides over a million downloadable apps & games

Big Data Facts

IOT – The internet of things

Internet connected devices that are collecting and transmitting data

- TVs with wifi connectivity
- Cars with OnStar (or similar network access)
- Appliances (refrigerators, thermostat, doorbells)
- Medical devices
- “Wearables”
- FitBit, Apple Watch
- Robots
- Assistants (Alexa, Google Home, Siri)

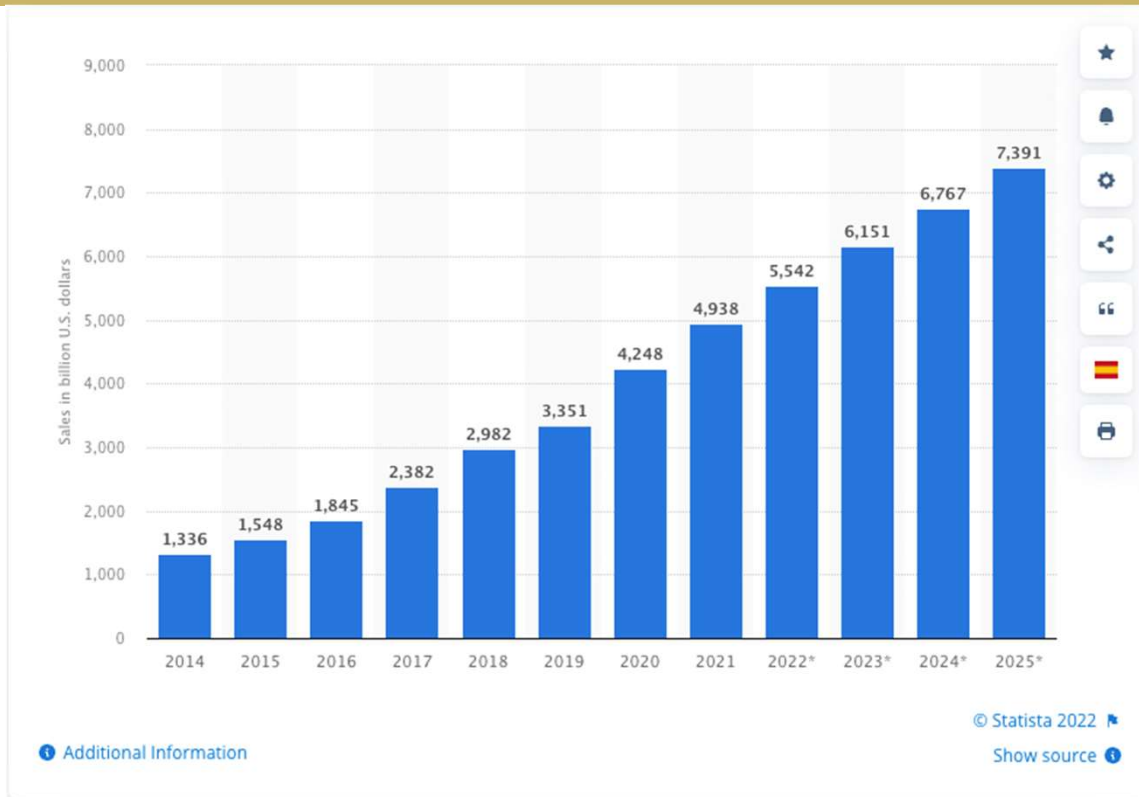
Big Data Facts

ECommerce

Data from [Statista](#) shows a huge increase in worldwide ecommerce sales, from \$1.3 trillion in 2014 to \$5.7 trillion in 2022.

A FOURFOLD lift in online revenue!

Big Data Facts



Big Data Facts

Online Entertainment

- Online video has a 90 percent penetration rate among internet users on any device.
- The majority of mobile video revenues are generated via subscriptions, followed by advertising.
- Current US mobile video subscription revenues have already surpassed 1 billion US dollars annually.

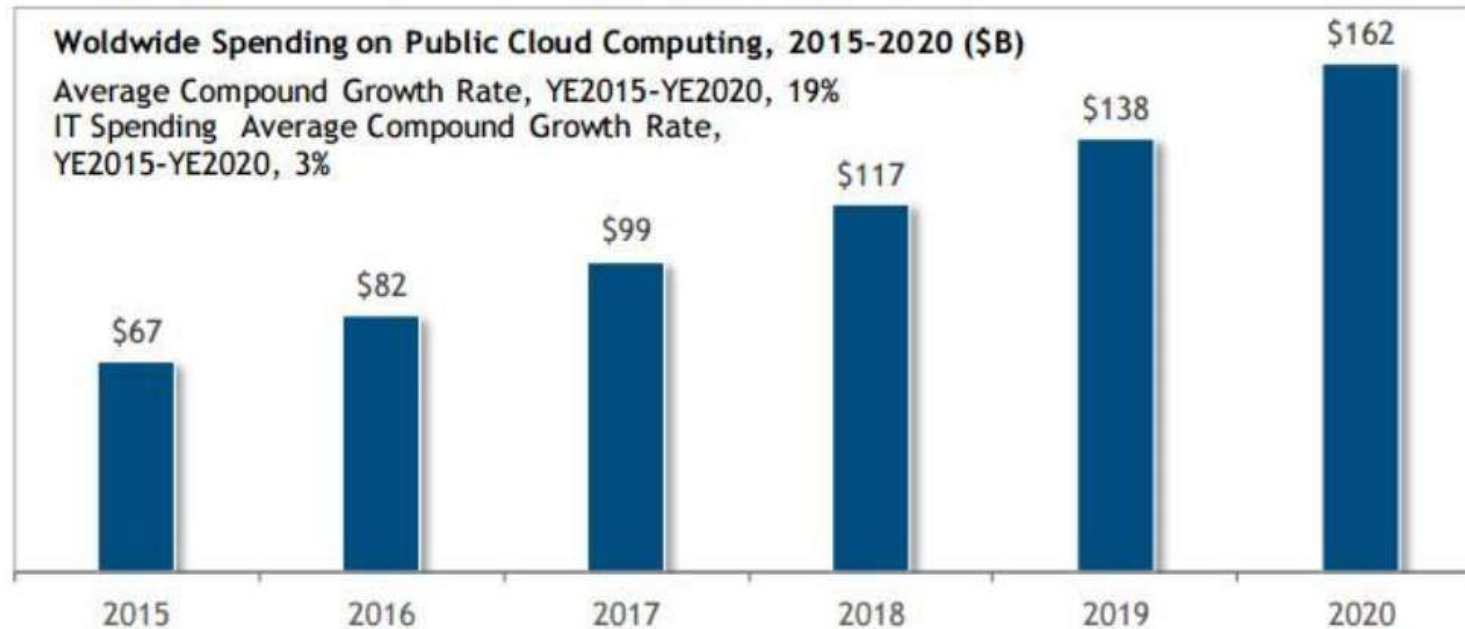
Big Data Facts

Cloud Computing

- Cloud computing spending is growing at 4.5 times the rate of IT spending since 2009
- According to IDC, worldwide spending on public cloud computing increased from \$67B in 2015 to \$162B in 2020 attaining a 19% CAGR.

Big Data Facts

The Rapid Growth of Cloud Computing, 2015-2020



Source: IDC, 2016

Big Data Facts

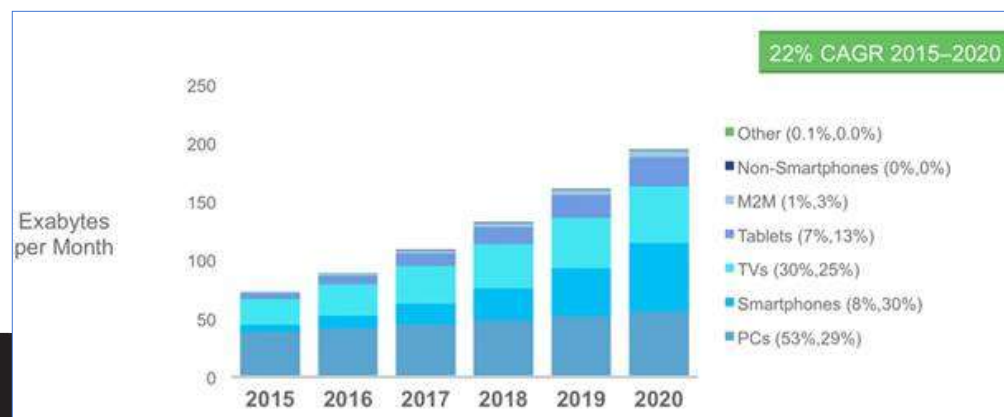
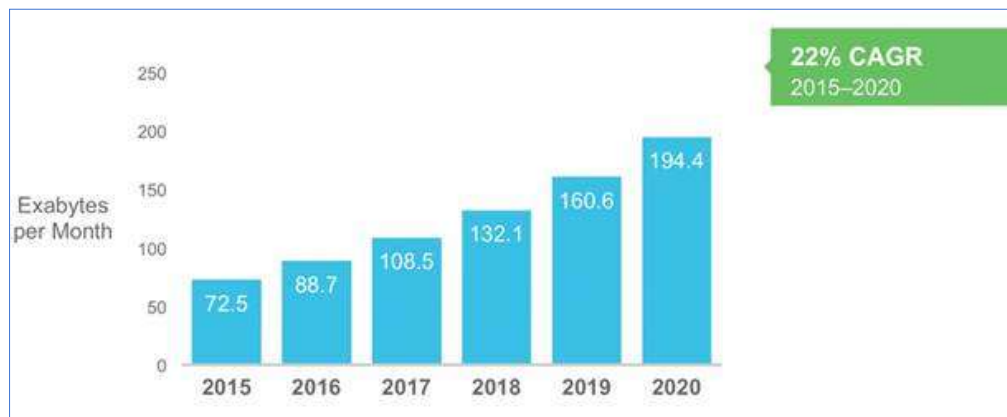
- 90% of the data on the internet has been created since 2016.
- In 2014 there were 2.4 Billion internet users
 - By 2016, this grew to 3.4 Billion
 - By 2022, this grew to 5.1 Billion
- More facts:
 - 1,209,600 new data producing social media users each day.
 - 656 million tweets per day!
 - More than 4 million hours of content uploaded to Youtube every day, with users watching 5.97 billion hours of Youtube videos each day.
 - 67,305,600 Instagram posts uploaded each day
 - There are over 2 billion monthly active facebook users, compared to 1.44 billion at the start of 2015 and 1.65 at the start of 2016.
 - Facebook has 1.93 billion daily active users (as of end of 2021)
 - 4.3 BILLION Facebook messages posted daily!
 - 5.75 BILLION Facebook likes every day.
 - 23 billion texts sent every day.

Big Data Facts

From DOMO.com



Big Data Facts



Big Data Facts

Summary

The computing marketplace is CHANGING

There is a rapid explosion taking place in

- the number of computing devices
- the number of people using them
- the amount of data being created and moved over the internet
- the demand to collect, store, analyze, and leverage this data explosion

This is forcing changes to the way we utilize database technology

Big Data Facts

Food for thought:

- How can we collect and store so much data?
- How can we analyze so much data and gain meaningful insights?
- Can my existing systems/architecture handle this?
- Why, or why not?
- Can my existing staff (skills & tools) make the transition?
- Why, or why not?

Big Data Facts

Next Topic: The Relational Problem