Institute for advanced architecture of Catalonia | BARCELONA

MASTER IN CITY & TECHNOLOGY
DIGITAL TOOLS AND BIG DATA
2021/2022

FACULTY DIEGO PAJARITO

Understanding flows, density and distribution

Multidimensional Data

A single object can be described using multiple variables

In econometrics, having more than three dimensions to describe a single phenomenon generates a panel a multidimensional data panel.

For advanced architecture, datasets are commonly build with tens of dimensions.

How many options do we have to analyse and understand these dimensions?

Definition from: https://en.wikipedia.org/wiki/Multidimensional_panel_data

Uni / multivariate and geospatial data exploration

Density and distribution of geospatial objects

Density and distribution of quantitative variables

Data import and processing for massive data sources

Geospatial processing using distances and trajectories

* Web API for data ingestion

To provide an experience handling common tasks of big data, data science or data analytics.

The course provides a **practical perspective** of the main activities developed for urban analytics. From data collection, ingestion, analysis and visualization, the students will **experience the workflow** while getting their hands on extracting information from massive datasets.

Source Code

Examples of the tasks performed during the course

Gallery / Dashboard / Portfolio

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Submission

Poster format

To identify data endpoints (sources / outcomes) and data access methods in data-driven research projects.

To plan and evaluate the alternatives to ingest and process data to minimise impactful and costly failures.

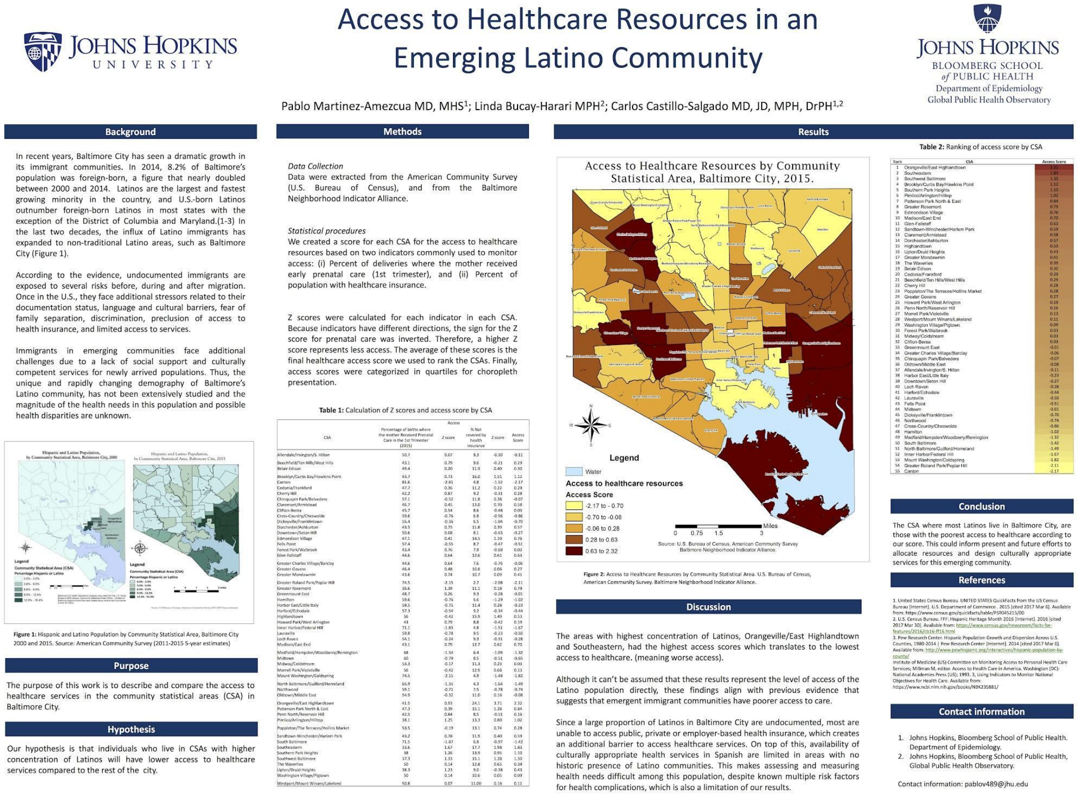
To foresee potential automation tasks and optimisation strategies for data processing.

Size: A1
Format: PDF and Editable in the submissions folder
Required (text): Title, data sources, conclusions and references

Aim:

Describe the data flows implemented as part of the studio project or an alternative research task.

Originally expected to continue with the studio groups but individual or alternative groups are accepted.



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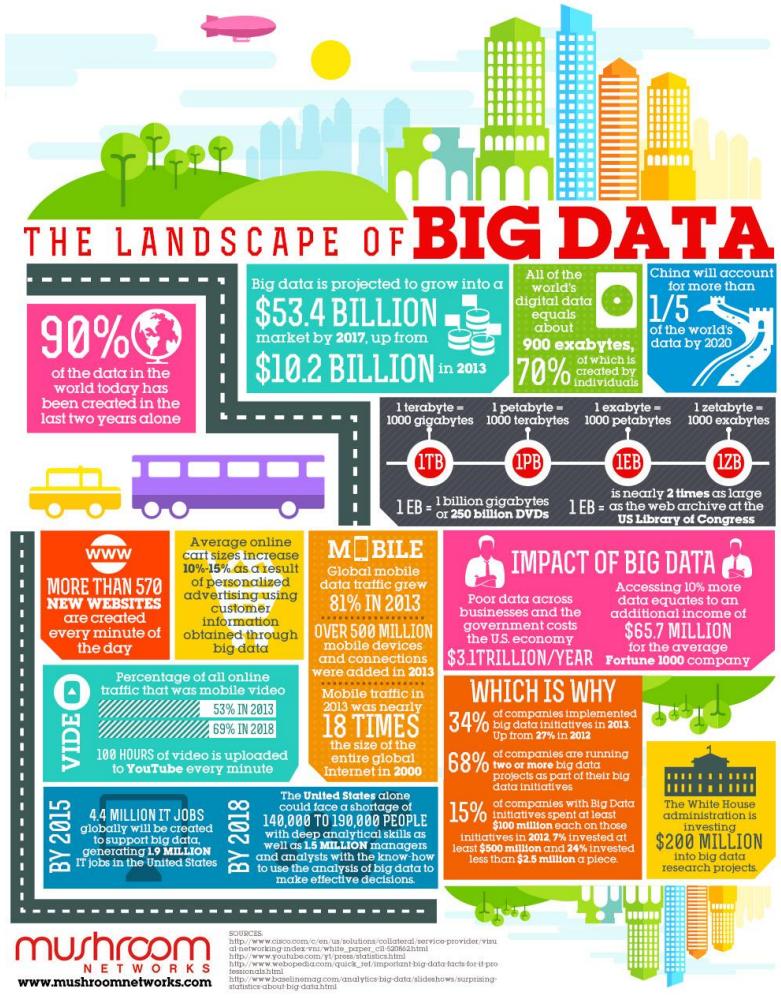
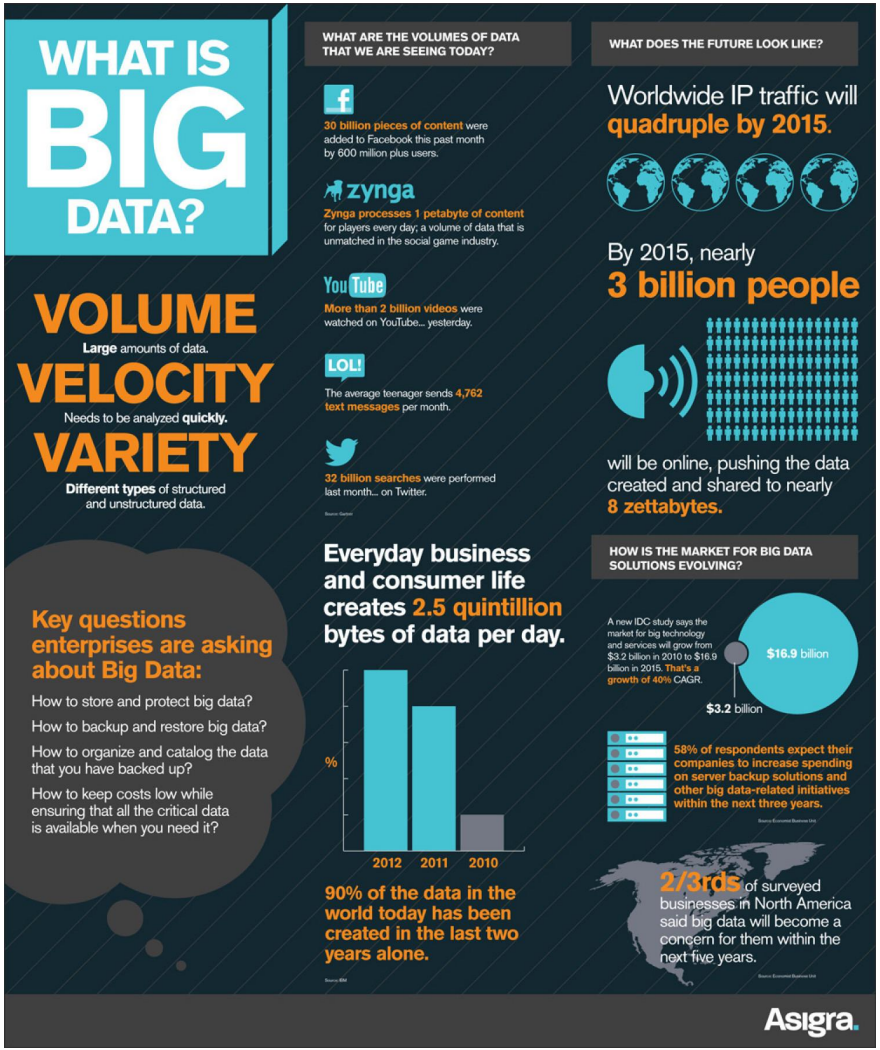
Some examples


THE LANDSCAPE OF BIG DATA
90%
of the data in the world today has been created in the last two years alone
Big data is projected to grow into a $53.4 BILLION market by 2017, up from $10.2 BILLION in 2013
All of the world's digital data equals about 900 exabytes, 70% of which is created by individuals
China will account for more than 1/5 of the world's data by 2020
1 terabyte = 1000 gigabytes
1 petabyte = 1000 terabytes
1 exabyte = 1000 petabytes
1 zetabyte = 1000 exabytes
1TB
1PB
1EB
1ZB
1 EB = 1 billion gigabytes or 250 billion DVDs
1 EB = is nearly 2 times as large as the web archive at the US Library of Congress
MORE THAN 570 NEW WEBSITES are created every minute of the day
Average online cart sizes increase 10%-15% as a result of personalized advertising using customer information obtained through big data
MOBILE
Global mobile data traffic grew 81% IN 2013
OVER 500 MILLION mobile devices and connections were added in 2013
Mobile traffic in 2013 was nearly 18 TIMES the size of the entire global Internet in 2000
IMPACT OF BIG DATA
Poor data across businesses and the government costs the U.S. economy $3.1TRILLION/YEAR
Accessing 10% more data equates to an additional income of $65.7 MILLION for the average Fortune 1000 company
VIDEO
Percentage of all online traffic that was mobile video
53% IN 2013
69% IN 2018
100 HOURS of video is uploaded to YouTube every minute
WHICH IS WHY
34% of companies implemented big data initiatives in 2013, up from 27% in 2012
68% of companies are running two or more big data projects as part of their big data initiatives
15% of companies with Big Data initiatives spent at least $100 million each on those initiatives in 2012. 7% invested at least $500 million and 24% invested less than $2.5 million a piece.
The White House administration is investing $200 MILLION into big data research projects.
BY 2015
4.4 MILLION IT JOBS globally will be created to support big data, generating 1.9 MILLION IT jobs in the United States
BY 2018
The United States alone could face a shortage of 140,000 TO 190,000 PEOPLE with deep analytical skills as well as 1.5 MILLION managers and analysts with the know-how to use the analysis of big data to make effective decisions.
mushroom NETWORKS
www.mushroomnetworks.com
SOURCES:
http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white_paper_c11-520862.html
http://www.youtube.com/yt/press/statistics.html
http://www.webopedia.com/quick_ref/important-big-data-facts-for-it-professionals.html
http://www.baselinemag.com/analytics-big-data/slideshows/surprising-statistics-about-big-data.html


WHAT IS BIG DATA?
VOLUME
Large amounts of data.
VELOCITY
Needs to be analyzed quickly.
VARIETY
Different types of structured and unstructured data.
WHAT ARE THE VOLUMES OF DATA THAT WE ARE SEEING TODAY?
30 billion pieces of content were added to Facebook this past month by 600 million plus users.
zynga
Zynga processes 1 petabyte of content for players every day; a volume of data that is unmatched in the social game industry.
YouTube
More than 2 billion videos were watched on YouTube... yesterday.
LOL!
The average teenager sends 4,762 text messages per month.
32 billion searches were performed last month... on Twitter.
Everyday business and consumer life creates 2.5 quintillion bytes of data per day.
%
2012
2011
2010
Key questions enterprises are asking about Big Data:
How to store and protect big data?
How to backup and restore big data?
How to organize and catalog the data that you have backed up?
How to keep costs low while ensuring that all the critical data is available when you need it?
90% of the data in the world today has been created in the last two years alone.
WHAT DOES THE FUTURE LOOK LIKE?
Worldwide IP traffic will quadruple by 2015.
By 2015, nearly 3 billion people
will be online, pushing the data created and shared to nearly 8 zettabytes.
HOW IS THE MARKET FOR BIG DATA SOLUTIONS EVOLVING?
A new IDC study says the market for big technology and services will grow from $3.2 billion in 2010 to $16.9 billion in 2015. That's a growth of 40% CAGR.
$16.9 billion
$3.2 billion
58% of respondents expect their companies to increase spending on server backup solutions and other big data-related initiatives within the next three years.
2/3rds of surveyed businesses in North America said big data will become a concern for them within the next five years.
Asigra.

Blog Post: Up to 300 words summarising the data flows implemented and the positive and negative aspects of the implementation. The blog post must include the poster.

Submission Date: A date before Monday March 21

Grades: Friday March 25

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