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[Big]-Data Analytics for Businesses

Today's plan

1. Course introduction
2. Example applications
3. Data analytics processes
4. Introduction to key tools

Our three goals

1. “Big picture”: Develop your intuition about identifying data analytics opportunities and their implementation challenges
2. “Medium picture”: learn how to approach data analytics projects
3. “Dirty hands”: Learn how to perform, read, and use key data analytics methods.

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What is big data? What is new?

What is big data?

What is new?

Big Data MYTHS

#1

BIG DATA IS BIG

Big data is not one big chunk of data, it's a collection of several different types of data feeds in its entirety that makes it big

#4

BIG DATA MEANS THAT ANALYSTS BECOME ALL-IMPORTANT

Marketers need to be empowered to do their own analyses

#7

BIG DATA IS GOOD, CLEAN DATA

Big data is dirty and messy

#2

BIG DATA ANALYTICS ARE AUTOMATED PROCESSES

The process of enacting and understanding "big data" is a very manual process, built up of many layers

#5

BIG DATA GIVES YOU CONCRETE, BLACK AND WHITE ANSWERS

We can never do away with human judgment and context

#8

BIG DATA MAKES BIG COMPANIES ALL POWERFUL

Yes, they know a lot. But do they know what to do with their knowledge?

#3

THE MORE GRANULAR THE DATA, THE BETTER

You'll miss the forest for seeing the trees

#6

BIG DATA IS A MAGIC 8-BALL


Well, yes, but you need to ask the question in exactly the right way.

#9

IT'S THE MATH THAT MATTERS

It's not the math that matters, it's the people and the process

**... It is not only about technology but
business value (WIN-WIN)**



« Thanks but no thanks. The only valuable warehouses out there
are those filled with casks of ageing spirits - not those filled with
servers »

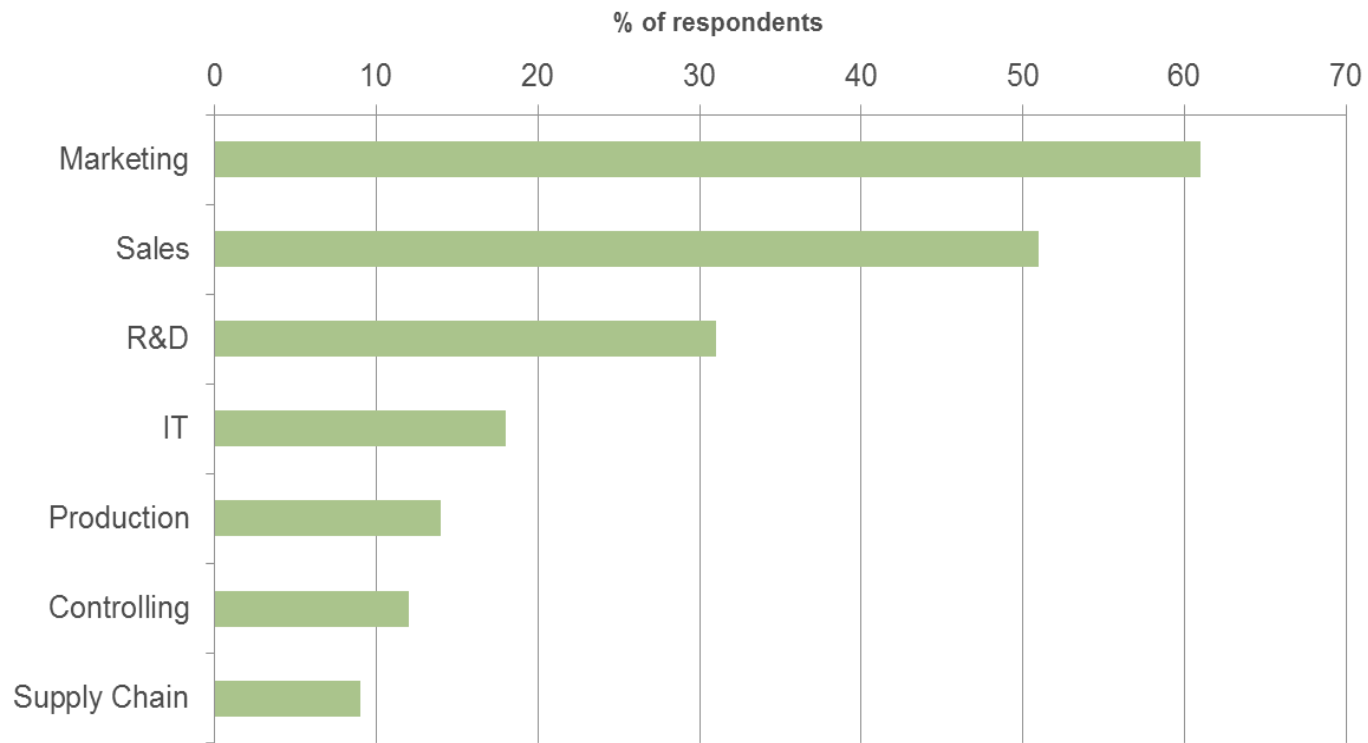
*San Francisco – Silicon Valley investor
to Sergei B. and Larry P. in August 1999*

Many Uses

- Marketing (i.e. acquisition, cross-sell, churn, etc)
- Personalization (i.e. targeted advertisement)
- Market positioning
- Fraud detection
- Monitoring of processes
- Credit scoring and risk management
- Financial modeling
- Knowledge management and text mining
-

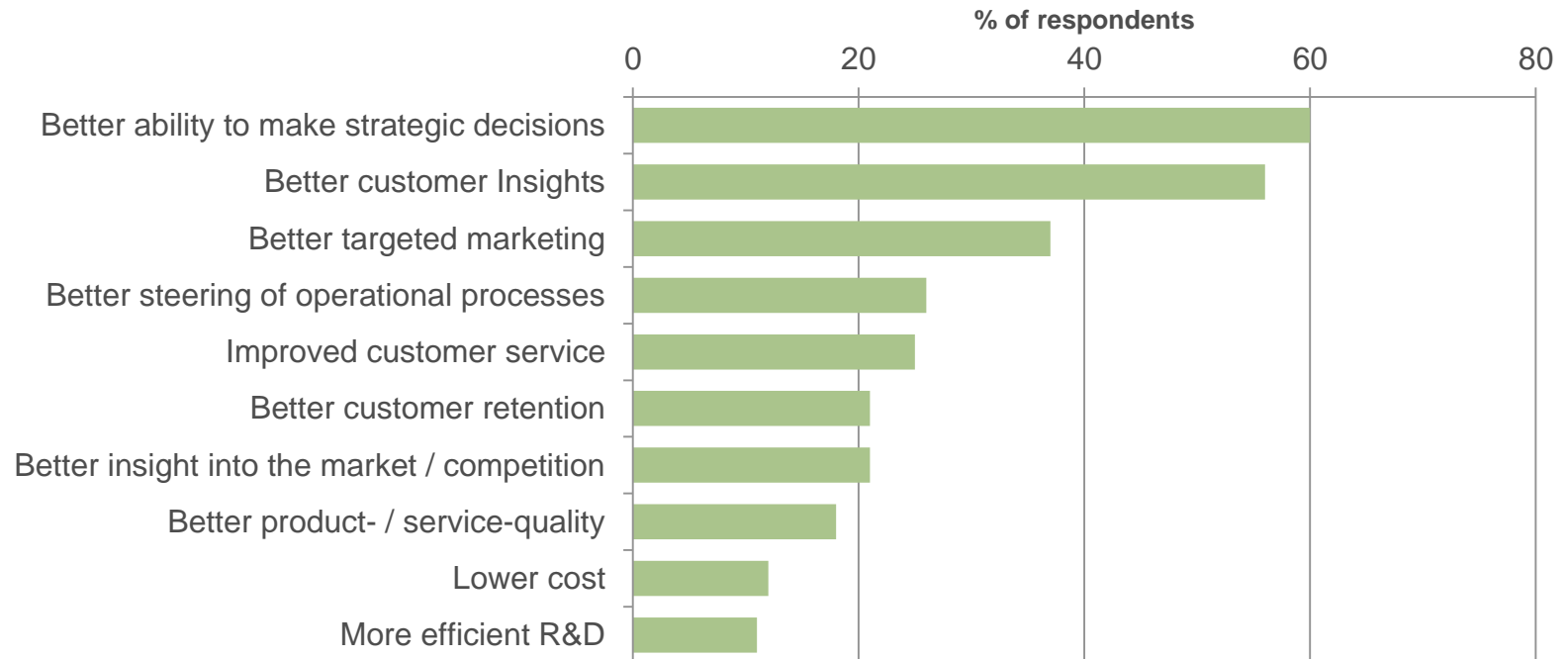
Marketing and sales are the key areas for big data...

Where do organizations plan to use big data in 1-3 years?



Making **better decisions** and getting to **better customer insights** are the main benefits of big data technologies and analysis...

The main benefits of Big Data technologies



The business value of big data: companies already using big data to make decisions show a **competitive edge**...

Organization's innovation performance





Organization's client intimacy performance



Organization's operational performance



Which of the following statements best describes your organization's stage in using big data to help make business decisions?

-  = currently not using big data to inform business decisions
-  = already using big data to inform business decisions

...and companies that are also using big data more **efficiently** are outperforming their peers even more

Organization's innovation performance






Organization's client intimacy performance



Organization's operational performance

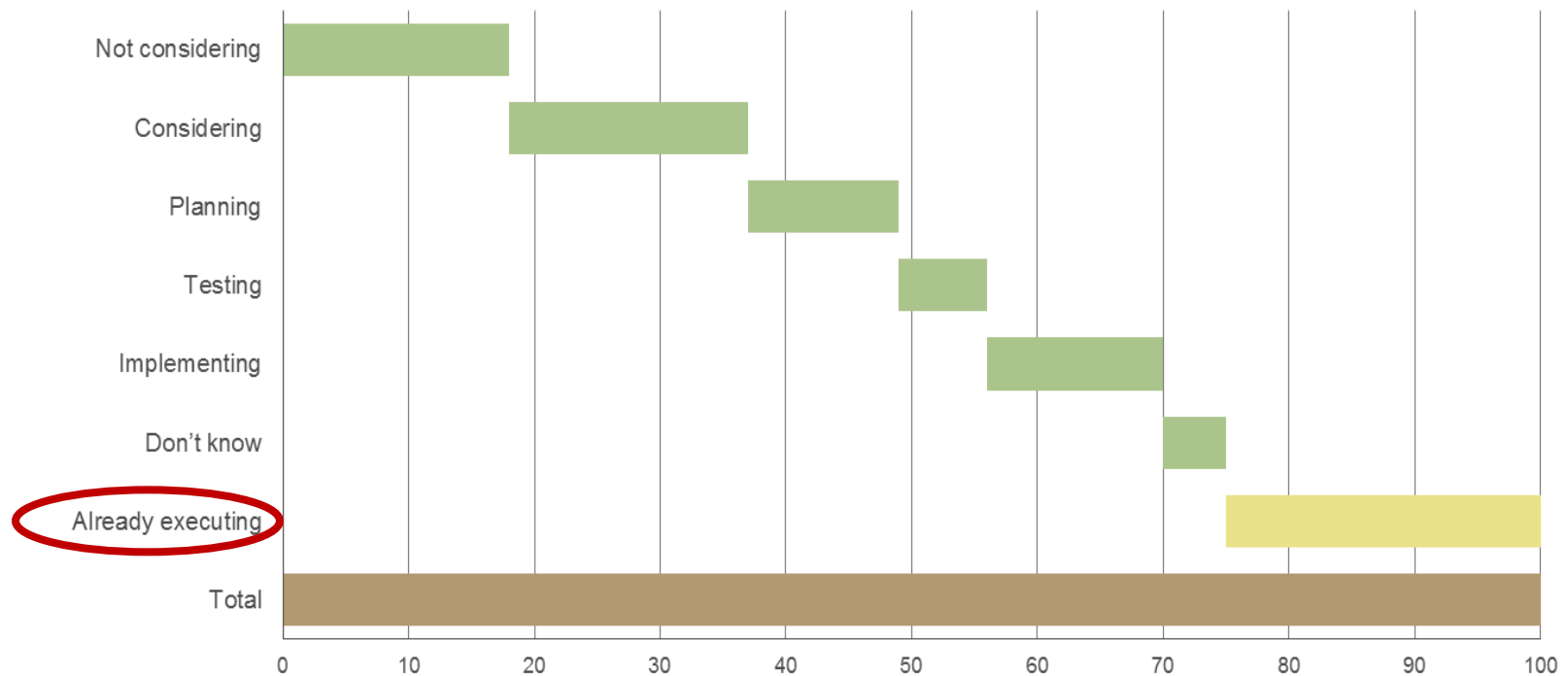


How efficient is your organization in internally sharing and reusing data analytics knowledge and research?

-  = (somewhat) inefficient in sharing and reusing data analytics
-  = average
-  = (somewhat) efficient in sharing and reusing data analytics

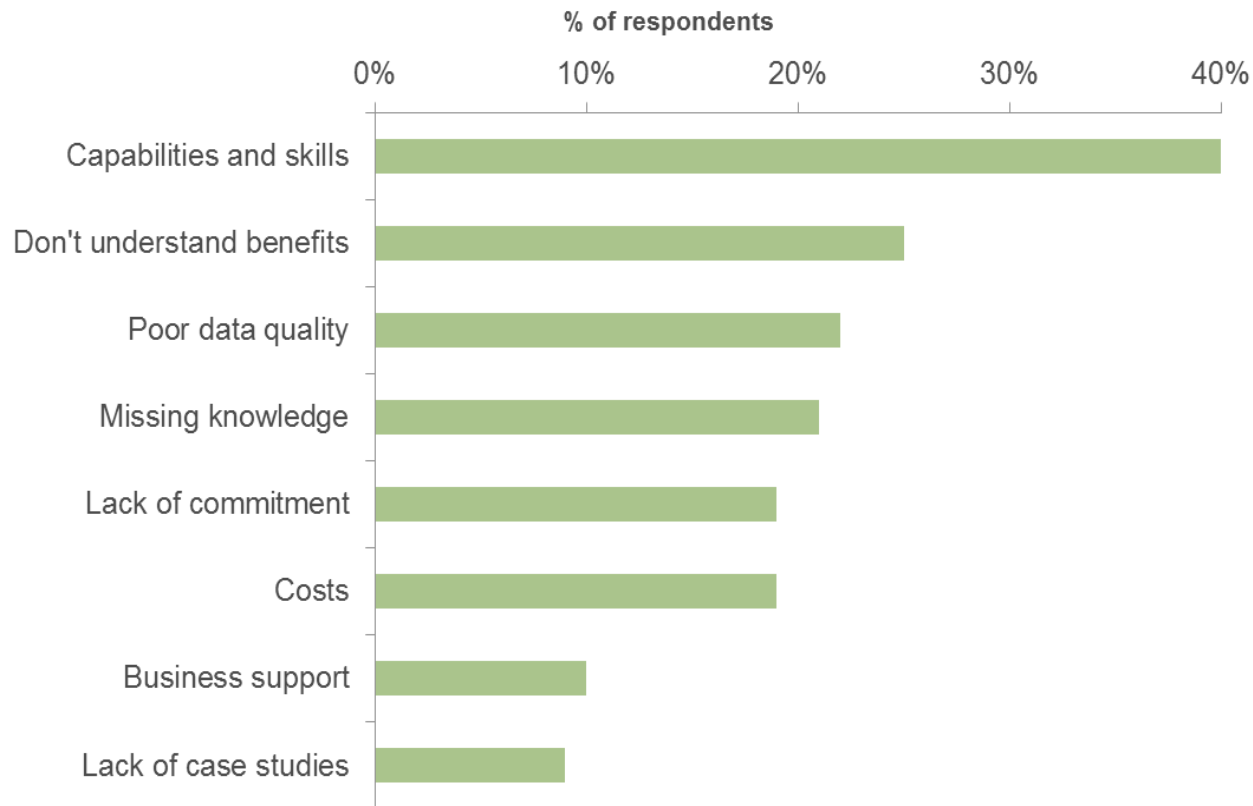
... but 75% of the companies participated in the study are still in early stages...

Companies already using big data



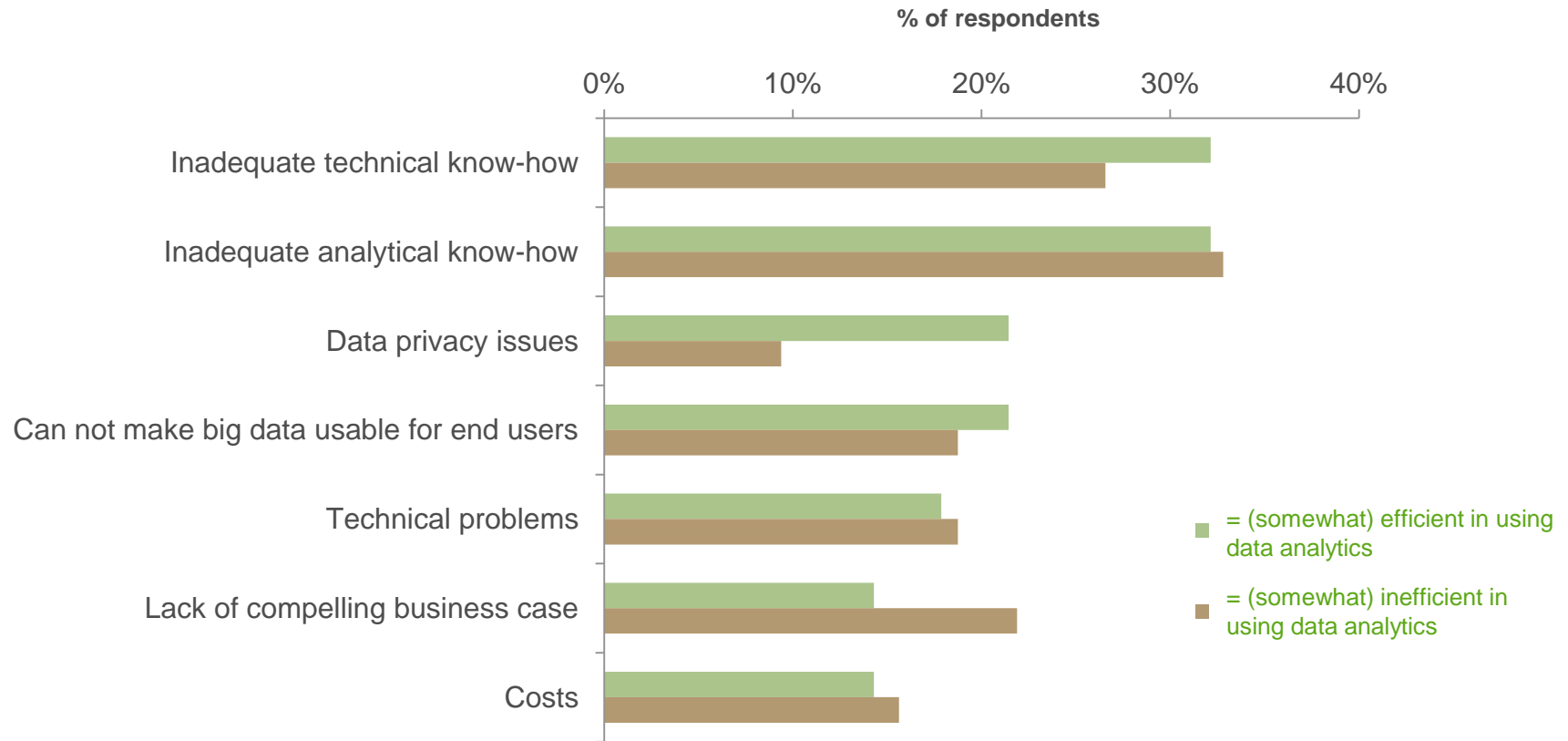
Missing **capabilities and skills** are the key reason why organizations do not use big data...

Key reasons why organizations are not considering or further exploring the use of big data



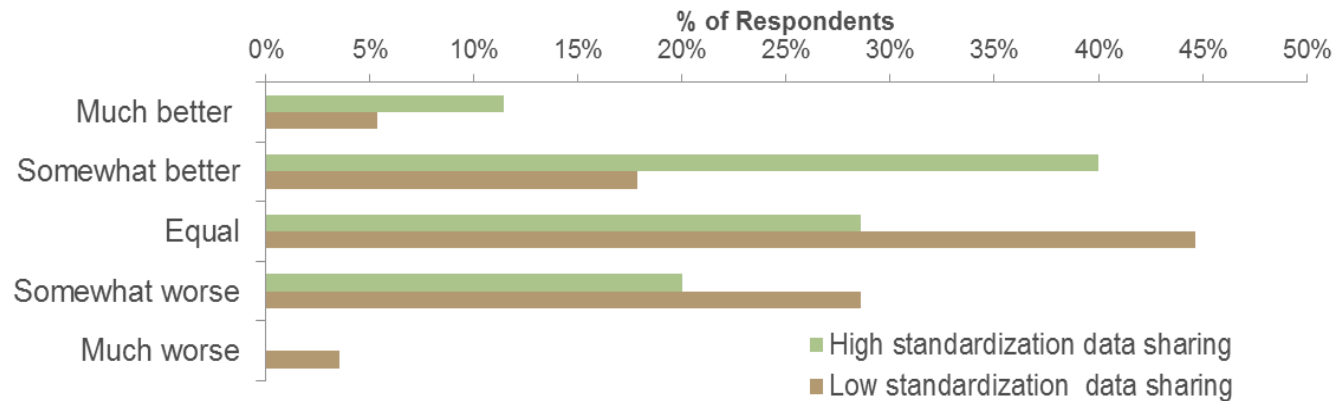
...but analyzing data effectively is also challenging....

The main challenges when using big data

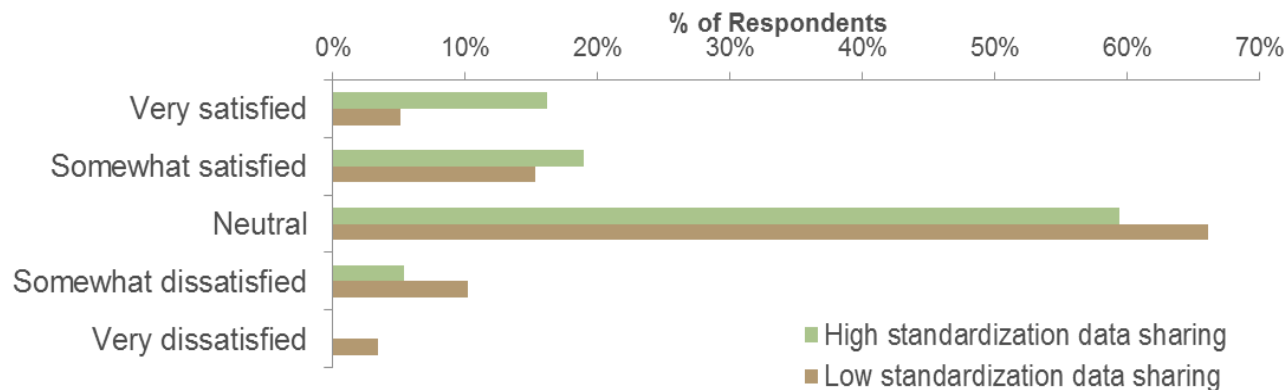


To bring value, data analytics need organizational enablers

Quality of data analytics compared to biggest competition



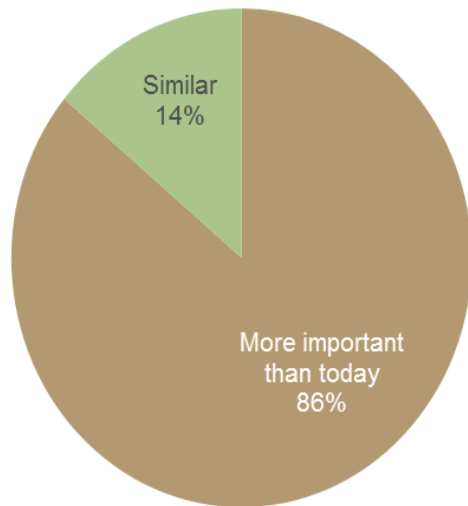
Satisfaction with ROI of big data



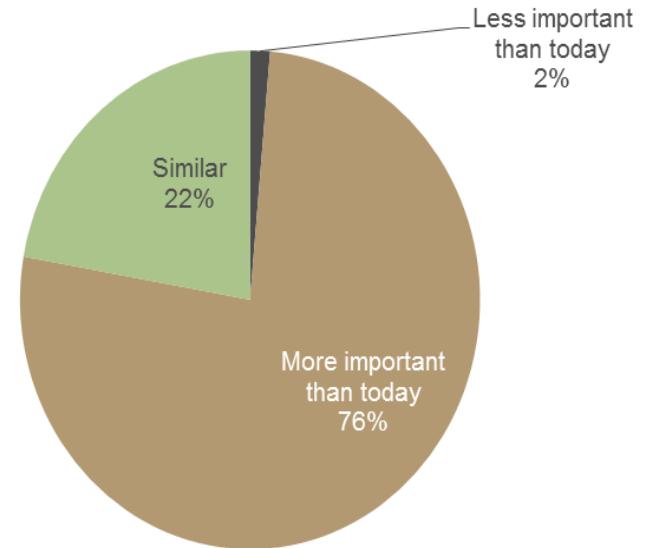
Companies already using big data are saying that it will become even more important for their business in the future

Relative importance of data analysis and data reporting in the next 1-3 years for your business

Companies already USING big data to inform business decisions

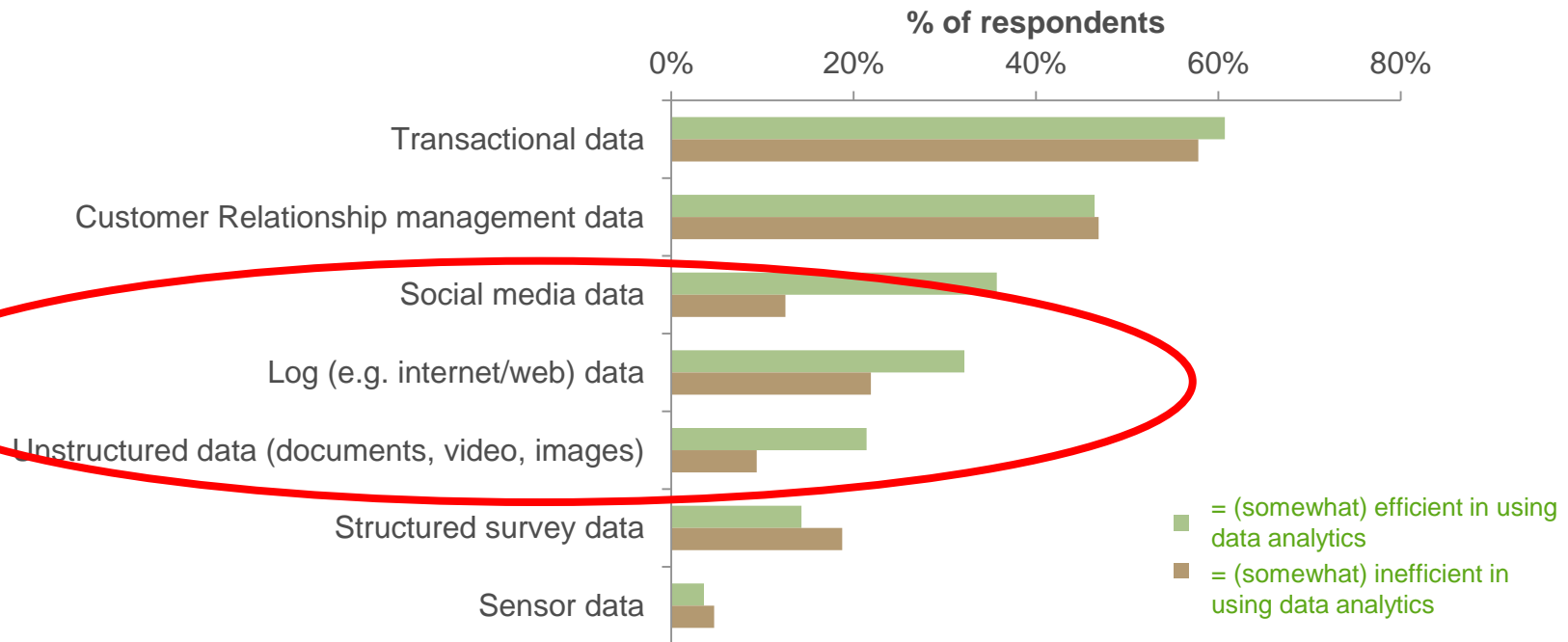


Companies currently NOT USING big data to inform business decisions



There is a big potential in understanding unstructured data...

The main types of data analyzed

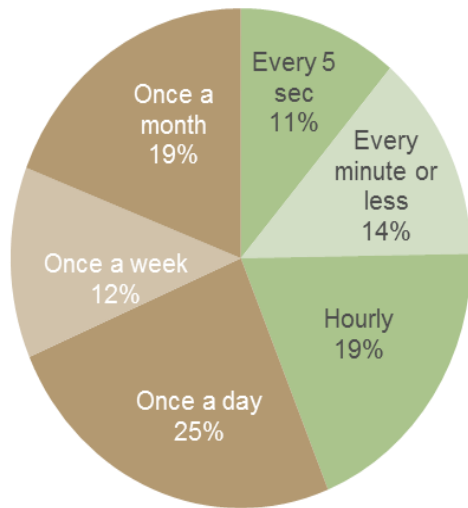


BUT

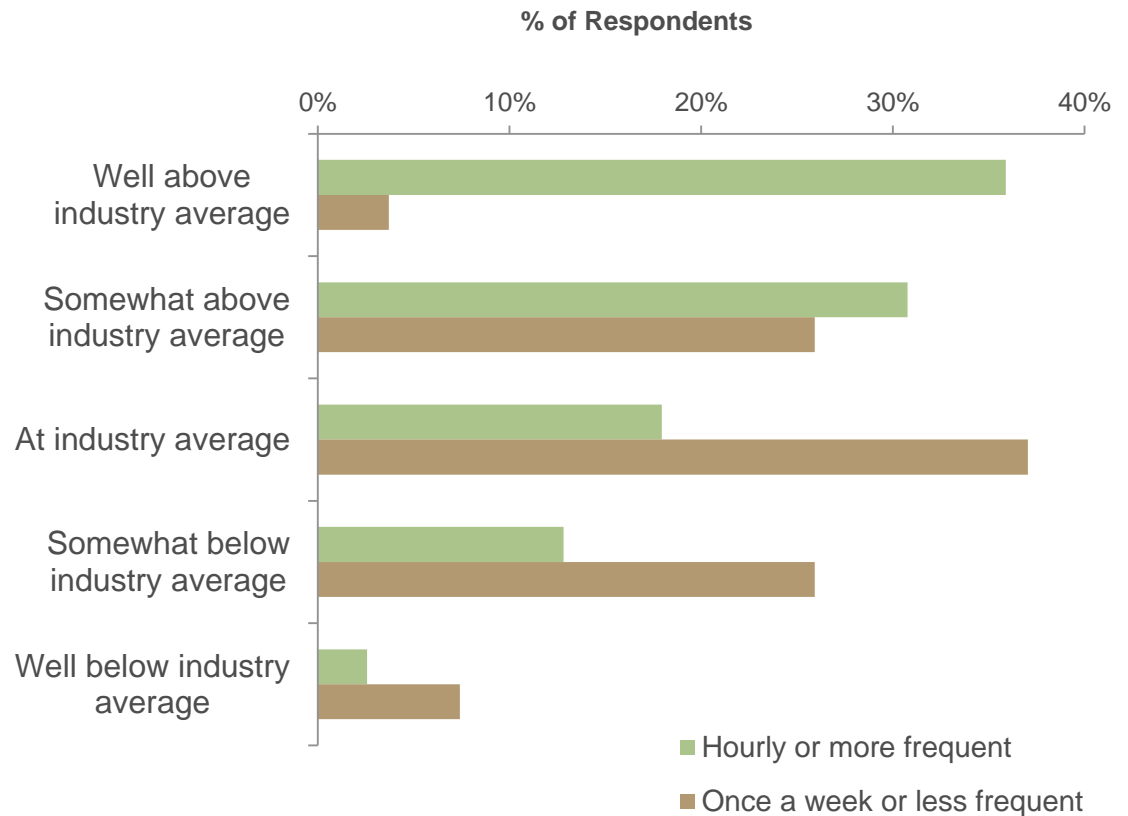
- 30% analysed data from just ONE source
- Over 50% analysed data from TWO source's
- Less than 20% analysed data from MORE THAN TWO source's

The business value of big data: it is not only about having large amounts of data but mainly about **analyzing data fast....**

Frequency of data analysis...



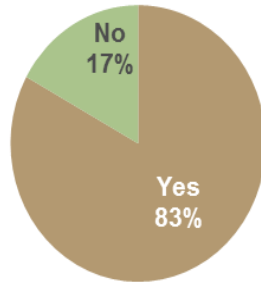
...and innovation performance



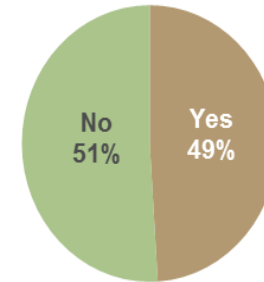
Companies that are already efficient in using big data will leverage new technologies more often in the future

Use of cloud based data analytics technologies the next 1-3 years

Companies already EFFICIENT in using big data

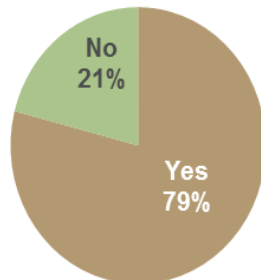


Company currently NOT EFFICIENT in using big data

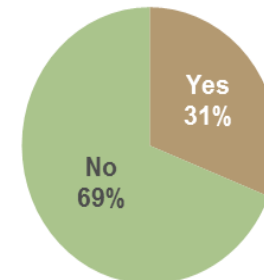


Use of open source data analytics technologies the next 1-3 years

Companies already EFFICIENT in using big data



Company currently NOT EFFICIENT in using big data



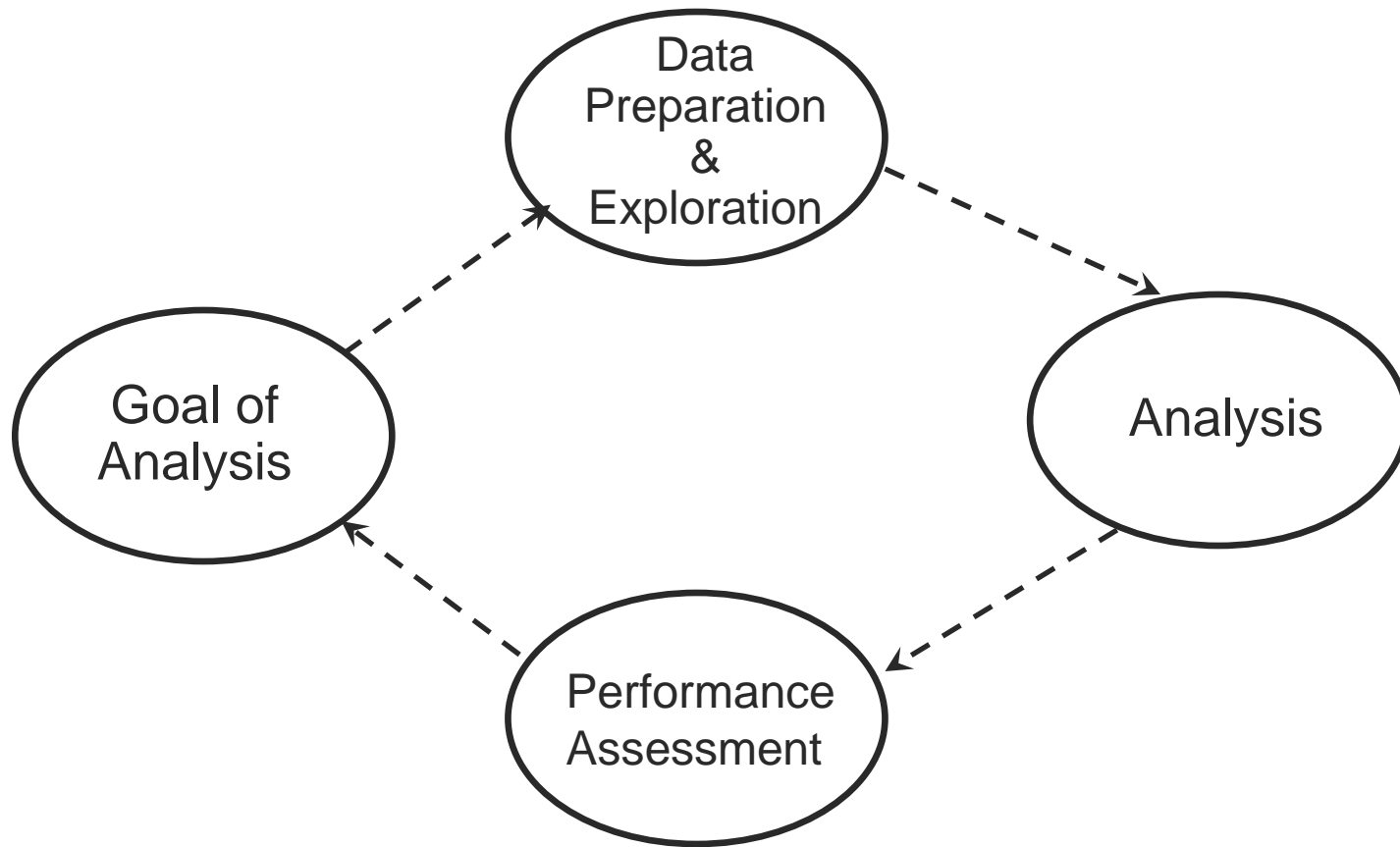
Summary of key pre-study findings

- Companies already using data analytics to make decisions show a **competitive edge** and could outperform their peers even more if **sharing and reusing** data analytics more efficiently
- **Marketing** and **sales** will still be the key areas of use
- **75%** of the companies are still in early stages
- Analyzing data effectively is **challenging** (e.g. lack of analytical of technical skills, lack of compelling business cases for investing in big data technologies, still data quality issues, etc.)
- Data analytics need organizational **enablers**. Two key enabler are **skills** and **standardization of data sharing**
 - The combination of high frequency of analysis and high data standardization is good for knowledge and innovation
- There is a big potential in understanding **unstructured** data
- **Cloud** and **open source** are expected to rise

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The *Iterative Process Cycle*



Step 2: Data Preparation and Exploration

- What is available?
- What is the right level of granularity?
- How much data is needed?
- What data quality issues do we have?
- How much history is required?
- Which variables should be used?
- What derived variables do we need?
- Is our data representative?

Step 3: Analysis

- What approach do I need to use?
- What is the right analytical method?
- Plot the data and compare!
- Digest and interpret!
- What is relevant?
- Association vs. causation!
- Short vs. long-term!

This is an **ITERATIVE** process!

- Revisit business objectives.
- Define new objectives.
- Gather and evaluate new data.

Example:

- A model discovers that geography is a good predictor of churn.
 - What do the high-churn geographies have in common?
 - Is the pattern your model discovered stable over time?

Why this class? Our three goals

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Basic Types of Questions and Tools

1. Market Basket Analysis: which pairs of products are typically sold together? – “On Friday evenings, shoppers who buy diapers also buy beer”.
2. Factor Analysis: Finding important dimensions (“factors”) that summarize your data, and visualizing your data
3. Clustering: What are the main types of customers we have?
4. Regression Modeling: What are variables that drive a specific outcome?
5. Discriminant Analysis: How can we differentiate between the “high value” and “low value” customers?

Group Project: Deliverable #1

SESSION 2: Please report your group before session 2 by email to Cecile Girardon (cecile.girardon@insead.edu).

SESSION 4: Please prepare a 1-page report. You will need to post this report on the course website **before 8am of May 13 (the day of sessions 4-5)**. For this report you need to answer the following questions:

- Name of the company you are studying (if it is for a new venture, please briefly describe the business model, market, and key processes).
- Which business processes and management decisions are affected from your data analytics proposal that you are sending to that company?
- What changes (e.g. organizational, processes, systems) do you expect the company will need to make order to effectively use the results of data analytics? What types of resistance do you expect, if any?
- How will you measure the value of your proposed data analytics project (e.g. process efficiency, predictive improvement with specific business impact, etc)?
- Also be prepared to briefly describe your project in class (no presentation needed, only brief answers to these questions as well as any other information you may find necessary).

Course grading

- Group assignment (part A & B): 50%
- Group project: 20%
- Class participation: 30%

To do for next time

- Download and install SPSS (trial version – from course website)
- Download and explore the Coffee data
- Read the “Boating Case” Part I

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