



Aalto University
School of Business

Business Intelligence

Lecturer: Assoc. Prof. Yong Liu (yong.liu@aalto.fi);

Course assistant: Pham Hà <ha.pham@aalto.fi>

37E00500

A short self-introduction

Yong Liu

Professori (Associate professor), Tietojärjestelmätiede
Department of Information and Service Management ([www](#))



[Profile](#) [Contact](#) [Publications](#)

PUBLICATIONS

These results are displayed live from [Research.aalto.fi](#). Visit the site for more information.

Peer-reviewed scientific articles

Journal article-refereed, Original research

Promoting users' smartphone avoidance intention: the role of health beliefs

Zhao, Haiping; Deng, Shengli; Liu, Yong; Xia, Sudi; Lim, Eric Tze Kuan; Tan, Chee Wee

2022 in Industrial Management and Data Systems

<http://www.scopus.com/inward/record.url?scp=85126776142&partnerID=8YFLogxK>

Dealing with pandemics

Hu, Feng; Teichert, Thorsten; Deng, Shengli; Liu, Yong; Zhou, Guotao

2021 in Tourism Management

<http://www.scopus.com/inward/record.url?scp=85102741110&partnerID=8YFLogxK>

- Doctor degree in Science of Business Administration and Economics in 2011, majoring in **Information Systems**
- Postdoc at the University of Oulu – The department of Computer Science, **Human-Computer Interaction**.
- Postdoc at the University of Hamburg in a research group of the **Marketing Department**.

Email: yong.liu@aalto.fi

Agenda

Overview

Schedule

Structure

(Introduction to BI)

Overview



This course aims at providing an understanding of data/analytics driven/informed decision-making and problem solving



It seeks to cover the building blocks of business intelligence (BI), such as data governance, reporting, visualization, and analytics



Besides a set of guest speakers representing academia and business life, an important feature of the course will be its group assignment (the Tableau challenge)



The course requires independent learning and organizational skills

Basic Information about BI and the Course

1. Business Intelligence (BI) is a relatively recent topic, unlike marketing and management sciences.
2. Driven by the popularity of self-service BI tools like Power BI.
3. Fast-evolving and our current understanding may become outdated in a few years.
4. A growing request for BI experts and leaders! Job-marketing is relatively good!

Previous speakers at the course

- Mr. Peder Berggren: Head of Business Intelligence at **H&M**
- Ms. Maria Kuosa: Head of Marketing Operations, **Konecranes**
- Mr. Robin Wiskström, Head of Business Intelligence, **F-Secure**
- Mr. Jyrki Tulokas, CDO & CTO, **Verkkokauppa**
- Mr. Kristian af Hällström, Business Intelligence Lead, **Sanoma**
- Mr. Ramesh Sharda, Vice Dean for Grad Programs and Research, **Spears School of Business**
- Mr. Heikki Lempinen, Head of Europe, **Reima**
- Ms. Anni Rasinen, Analytics & AI Lead at **Fiskars Group**
- Mr. Janne Lind, **Salesforce**
- Mr. Juha Teljo, Vice President of Solution Engineering in EMEA, **Tableau / Salesforce**
- Mr. Timo Herttua: Head of Product, **Hoxhunt**
- Mr. Henri Ikonen, Head of Data Engineering, **Aktia Bank**
- Mr. Kari Häkkinen, CDO, **Marimekko**
- etc

Job Market: How to take this course

- 1. A switch from B2C companies to B2B companies - A dearth of BI experts in B2B companies.**
 - Only about 40% of Finnish companies have employees with specific BI roles based on a study of the top 500 Finnish companies or organizations in terms of revenue.
 - I predict a surge of demand for BI experts and leaders from B2B companies.
- 2. BI team leader → BI department head → CDO (Chief Data Officer).**

Take this course by envisioning yourself as a BI leader.

Course design

BI theories

- **Lectures**
- **Guest talks**
- **Course book**

Long-term benefits;
necessary knowledge
if you want to be a
CTO or a BI leader

BI Software/Practice

- **Power BI**
- **Weka**
- **Tableau (A challenge event)**

Immediate benefits;
necessary skills if
you want to gain a
BI-related jobs

Targets of course
evaluation

**What** Power BI**Where** helsinki**Find jobs**

Publication date ▾

Within a 25 mile radius ▾

Type of job ▾

Location ▾

Company ▾

The language of the workplace ▾

Post your resume - It only takes a few seconds

Power BI jobs in Helsinki

Sorting criteria: **Correspondence** - Date

68 jobs

Summer job 2023 Data Analyst trainee, Helsinki

Stora Enso 3.8 ★

Helsinki

Full time job

- You will be working in Forest Division and you will report to Head of Forest Data Services, Rami Lahti.
- Data analysis and reporting for the needs of different...

Published 25 days ago · More...

**Summer job 2023 Data Analyst trainee, Helsinki**

Stora Enso 72 reviews

Helsinki

You must create an Indeed account before you can apply for a job on the company's site.

Apply for a job on the company's website**Workplace information****Type of job**

Full time job

power bi

Helsinki

Find jobs

Publication date ▾

Within a 25 mile radius ▾

Type of job ▾

Location ▾

Company ▾

The language of the workplace ▾

Post your resume- It only takes a few seconds

power bi jobs in Helsinki

Sorting criteria: Eligibility - Date

99 jobs 

Summer Trainee, Power BI Analytics



Metso Outotec

Espoo

Temporary

- Join an industry leader and make a positive change in the sustainable use of the world's natural resources.
- Together, we will Transform the business and drive...

Published 16 days ago · More...

Rise above the possible



Metso

Summer Trainee, Power BI Analytics

Capercaillie  593 reviews

Espoo

You must create an Indeed account before you can apply for a job on the company's site.

Apply now



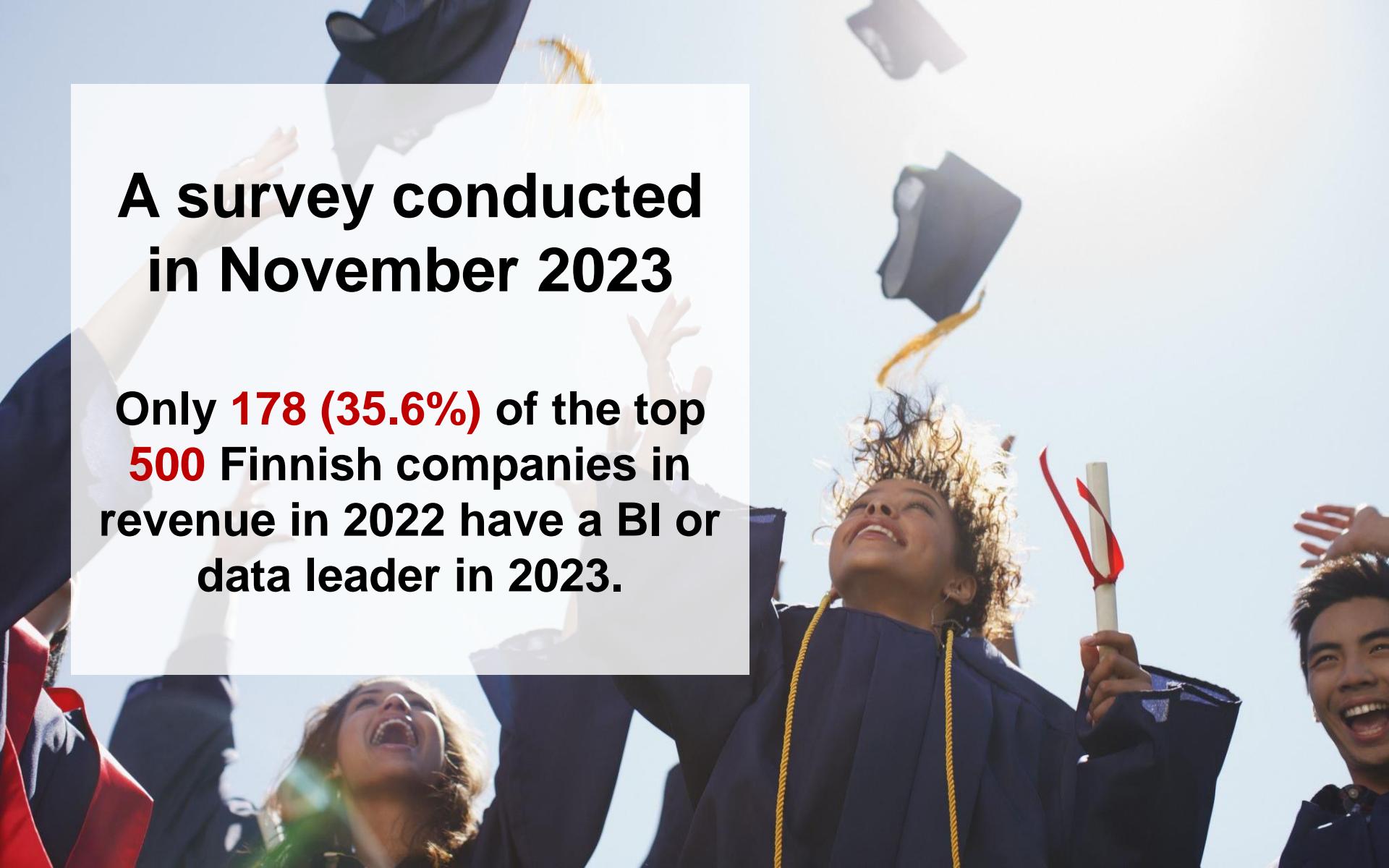
Workplace information

In this way, the workplace settings correspond to the job description. You can edit the job settings at any time [in your profile](#).

Type of job

16:22:58

10



A survey conducted
in November 2023

Only **178 (35.6%)** of the top
500 Finnish companies in
revenue in 2022 have a BI or
data leader in 2023.

A Pan-Finland Industrial Survey

BI as a new business growing point!

The **top 500 Finnish** companies regarding revenue in 2022 were investigated. **322** companies were found to have BI, data, or IT leaders, of which **178** have BI or data leaders. **35** companies with BI, data, or IT leaders participated in this study.

48.6% of the participating companies have 1000+ employees, while **43%** have 250-1000 employees. **74%** of companies have over 20 years of history.

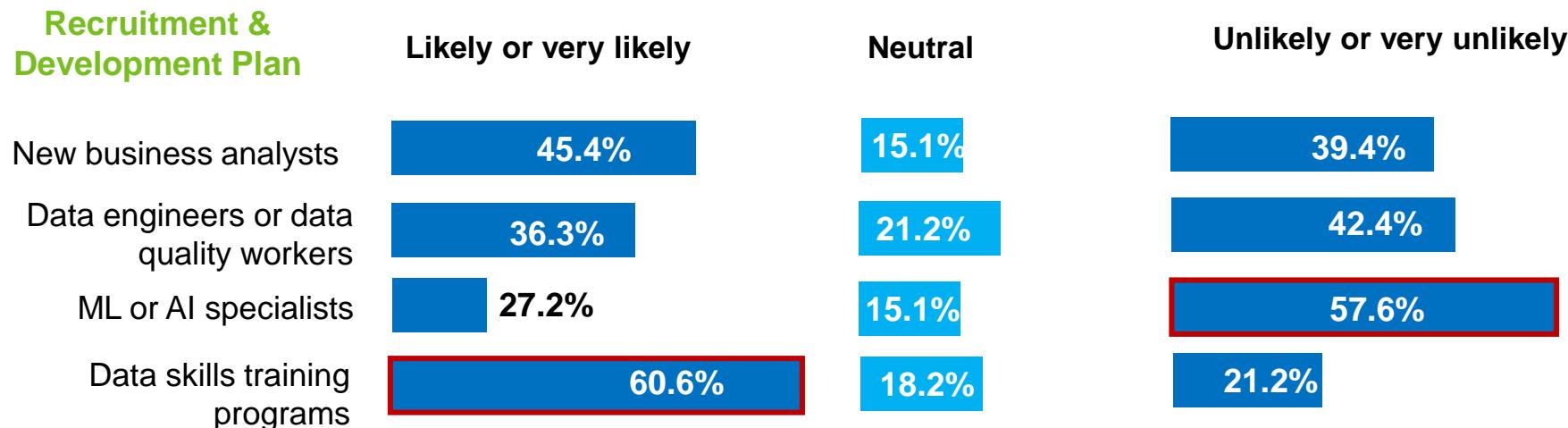
Data has not been well utilized in Finnish companies; only 35.6% (178) have BI or data leaders.



Employee Recruitment and Training Plan

Recruitment and employee training are useful for enhancing companies' data and BI capacities.

Regarding the recruitment and training plan for the surveyed companies in the next 6 months, **60.6%** of companies plan to offer data skills training programs to their employees. **45.4%** of companies plan to recruit new business analysts, and **27.2%** of companies plan to recruit more ML or AL specialists. Recruiting more data engineers and quality workers is also a plan for **27.2%** of the companies surveyed. Interestingly, **57.6%** of companies are unlikely to recruit ML or AL specialists in the next 6 months.



Schedule 2024

Session	Date	Day	Time	Length (h)	Room	Topic	Lecturer	Note
1	26 Feb	Mon	10:15–12:00	2	R038/ V001	Introduction: Business Intelligence I	Yong Liu, Aalto	
2	28 Feb	Wed	10:15–12:00	2	R038/ V001	Introduction: Business Intelligence II	Yong Liu, Aalto	
3	04 March	Mon	10:15–12:00	2	Online	Power BI	Yong Liu, Aalto	Tutorial videos as Lecture
4	06 March	Wed	10:15–12:00	2	R038/ V001	Data Visualization	Yong Liu, Aalto	
5	11 March	Mon	10:15–12:00	2	R038/ V001	Data Visualization & Data	Yong Liu, Aalto	
6	13 March	Wed	10:15–12:00	2	R038/ V001	Business Intelligence in Real Life	Robin Wisktröm (F-secure)	
7	18 March	Mon	10:15–12:00	2	R038/ V001	Data	Yong Liu, Aalto	
8	20 March	Wed	10:15–12:00	2	Online	Weka	Yong Liu, Aalto	Tutorial videos as Lecture
9	25 March	Mon	10:15–12:00	2	R038/ V001	Generative AI/Large Language Models in industry and research	József Mezei (Åbo Akademi)	
10	27 March	Wed	10:15–12:00	2	R038/ V001	Analytics Market	Juha Teljo, Salesforce	
11	08 April	Mon	10:15–12:00	2	R038/ V001	Why Tableau?	Janne Lind, Salesforce	
12	10 April	Wed	10:15–12:00	2	R038/ V001	Business analytics	Yong Liu, Aalto	
13	09 April	Tue				Challenge Announcement		
14	19 April (13:00)	Fri				DL to submit challenge reports and videos		
15	23 April	Tue	10:00 – 13:00	4	R038/ V001	Final competition event	Best 5 teams	

A 6-credit course = 6 X 27 hours = 162 hours

26.2.2024

14

Tutorial video sessions

For the sessions of the BI software study (sessions 3 & 8),

1. The tutorial video is available now on Mycourse.
2. **NO lectures for sessions 3 & 8 / No need to come to the lecture hall**
3. You could start software learning already after the first class!
4. Online assistance: I will be available online during these two sessions **(sessions 3 & 8)**.

Zoom: <https://aalto.zoom.us/j/5138969960>

Absence and Compensation

1. **For on-site lectures**, please mark your attendance before the class starts (registration function available between 10:05 and 11:30).
 - Forgot to mark attendance → Contact TA (Pham Hà <ha.pham@aalto.fi>)
2. For those unable to attend on-site lectures, a learning diary must be completed for each missed session.

Welcome



ATTENDANCE

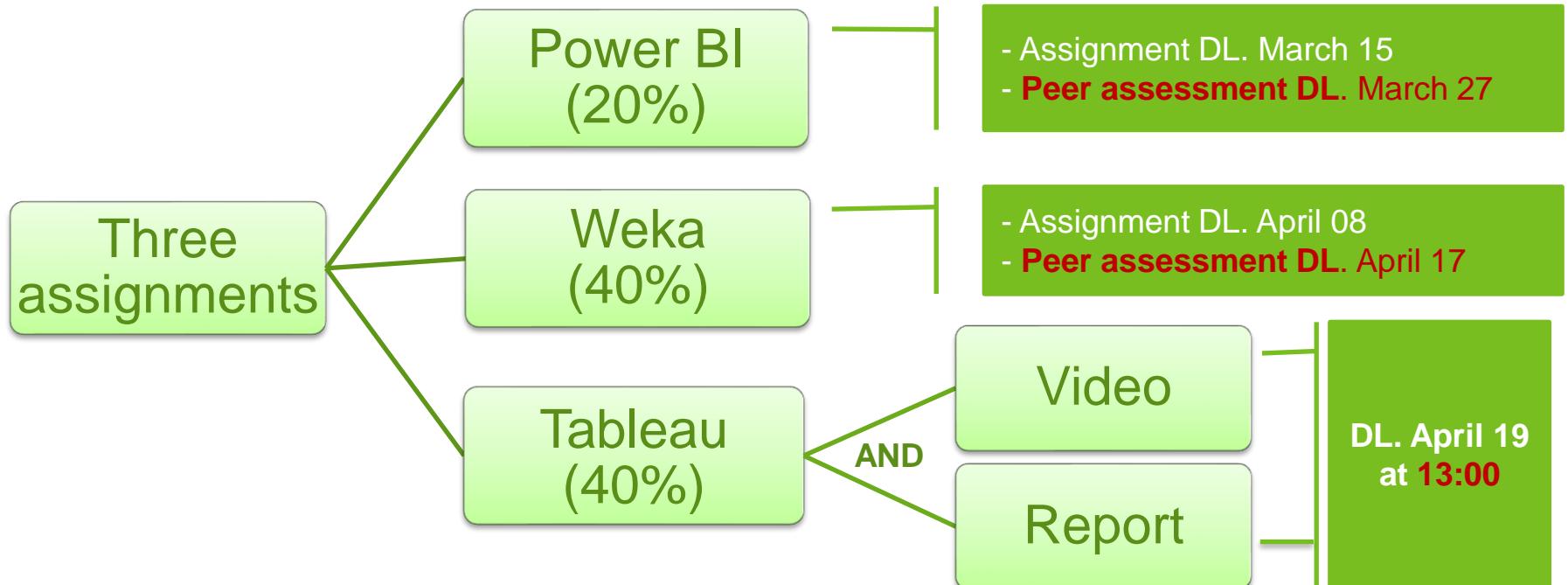
Attendance - Only for on-site lectures

Mark as done

Please mark your attendance here for on-site lectures. The attendance function will automatically open between 10:05 and 11:30 during the lecture time.

Please note that software lectures through online tutorial video have no requirement for marking attendance.

Assignments and evaluation scheme



- Power BI and Weka assignment: An **individual** assignment
- Tableau assignment: A **group** assignment
- Establish your group in MyCourse for the Tableau assignment by **March 13**.
- Earn extra points (2/100) from returning feedback surveys sent by the school.

Important Dates

March 13: DL for forming a group of 3 - 5 members (If active team members are less than three, please contact TA <ha.pham@aalto.fi>).

March 15: DL for Power BI assignment

March 18 (Monday, ~12:00): Peer assessment of the Power BI assignment starts

March 27: DL for Power BI assignment peer assessment.

April 08: DL for Weka assignment

April 11 (Thursday, ~12:00): Peer assessment of the Weka assignment starts

April 12: DL to submit learning diary (only for unattended lectures, excluding online video sessions)

April 17: DL for Weka assignment peer assessment.

April 09 (~14:00): Tableau Challenge Announcement

April 19 at 13:00: DL to submit videos and reports (Tableau Challenge)

April 20 (~13:00): Five teams will be selected and informed to participate in the final competition.

April 23 (10:00 – 13:00): Final Competition Event (5 teams)

Students say drawing lots is a good way to form groups

Published: 15.8.2023

According to the annual AllWell? survey, students want teachers to form groups for course work instead of picking who they want to work with



Photo: Aalto University/Ari Toivonen

Students prefer random groups in group assignments

“Both first- and second-year students in BSc programmes and first-year students in MSc programmes feel that random groups would be better in group assignments than free forming of groups. This feedback rises from both the AllWell survey and the “Mursupalaute” (first-year student feedback) over several years. Random groups make it easier for students from different backgrounds to find a group and succeed in the course, while also helping to create the sense of belonging to the community and finding friends.

Randomly formed groups prepare students for working life, where you cannot always choose who you want to work with.”

<https://idp.aalto.fi/idp/profile/SAML2/Redirect/SSO?execution=e2s1>

26.2.2024

Tableau Assignment Group Formation

- Groups will be initially formed with 4-5 randomly selected members.
- If your group comprises only two or fewer members (e.g., due to team members dropping from the course), please contact the lecturer. We will arrange to merge your group with another.

Grading Method/ Schema

Final grade =

The grade for Power BI assignment X 0.2 +

The grade for Weka assignment X 0.4 +

The grade for Tableau assignment X 0.4

- **Scale for assessment: 0 - 5**

Penalty for not submitting assignments:

1. No submitting Power BI assignment: - 1 (scale 0 - 5)
2. No submitting Weka assignment: - 1 (scale 0 - 5)
3. No submitting Tableau assignment: - 1 (scale 0 - 5)

Aalto-UTU-Tableau Challenge

- The challenge is organized by Aalto University, Turku School of Economics, and Tableau (Salesforce).
 - **Challenge event:** A half-day event on **23 April** [Please mark it in your calendar]
 - Event time: 10:00 – 13:00 (Tentatively)
 - Lecture hall: R038/V002
- **Bonus to participating members of participating teams (1/5),**
 - *At least two members of the team should attend the event.*
 - *Five teams will be selected to participate in the event, but others can participate as audiences.*
 - *Bonus to the best Aalto Team (1.5/5 points)*
 - *Please indicate your willingness to participate in the event in your assignment.*

Bonus System

Participation	Bonus
Participation in the Challenge Event (Best Aalto Team)	1/5 (1.5/5)
Course Feedback - The feedback survey sent by Aalto BIZ - No bonus by sending feedback via email	(2/100) points

Training (I)



Power BI

Free license – Not a pro license

Power BI is BI software for building and running reports and dashboards

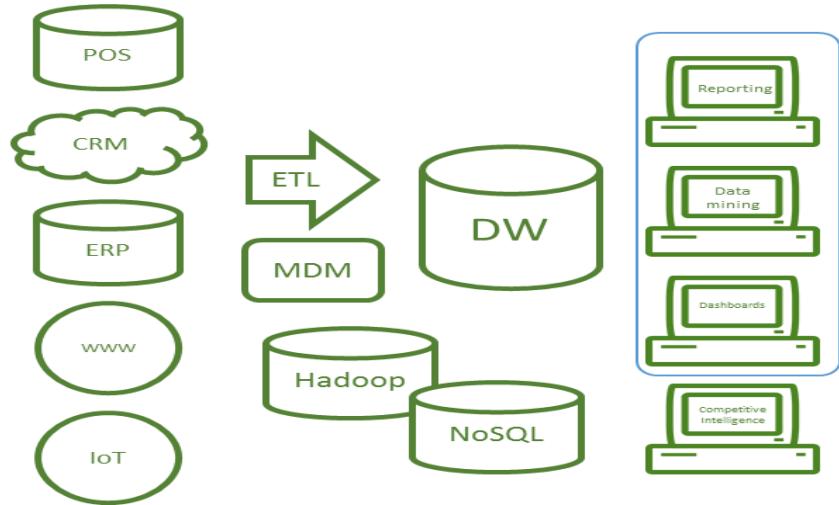
You can log in to Power BI by using your Aalto credentials

Power BI Desktop: <https://powerbi.microsoft.com/en-us/downloads/>

Power BI web: <https://powerbi.microsoft.com/en-us/landing/signin/>

Power BI Desktop: Windows-only APP

Aalto VDI for Mac User: <https://vdi.aalto.fi/>



- Tutorial videos are available.
- Feel free to ask questions.

Aalto VDI for Power BI



Mac users can access Power BI via Aalto VDI

Please install the VDI client for a better user experience

Power BI desktop already installed at VDI

Total time of tutorial videos: 150 minutes

Tutorials are now available in MyCourse – Suggest starting your learning right after the first class!



VMware Horizon

You can connect to your desktop and applications by using the VMware Horizon Client or through the browser.

The VMware Horizon Client offers better performance and features.



Install VMware
Horizon Client



VMware Horizon
HTML Access

Check here to skip this screen and always use HTML Access.

Requirement: a basic user!

Training (II)



+ a b | e a u

Tableau (Salesforce) offers you access to Tableau software

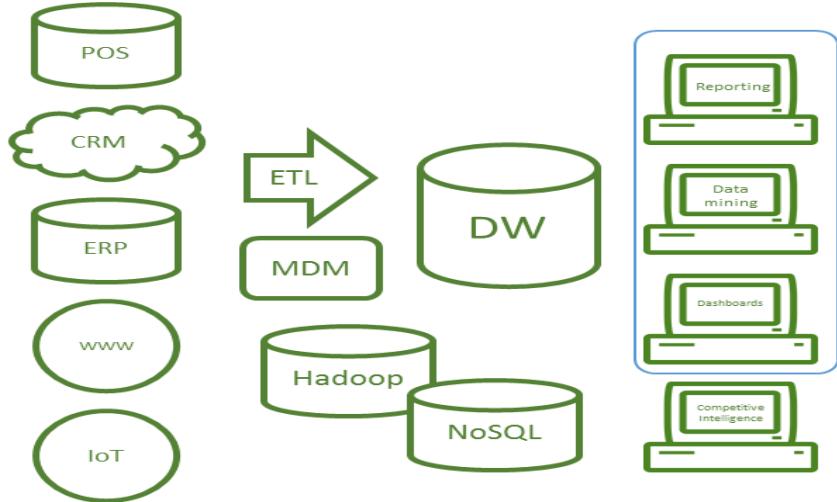
Tableau is BI software for building and running reports and dashboards

License: TC47-EBAE-A2A0-13DE-6A26

Tableau Online: <https://online.tableau.com/>

You may use them both inside and outside Aalto network

See our course site for tutorials



Requirement: being a skillful user!

Training (III)



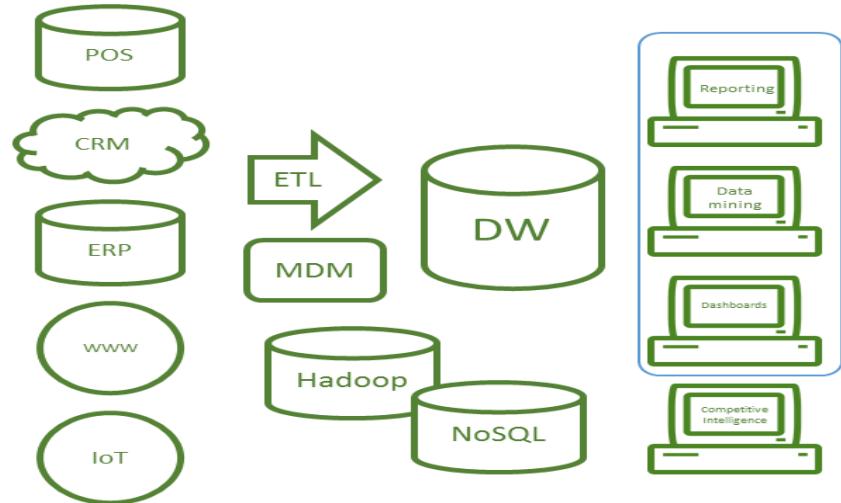
Weka offers an easy-to-use platform for machine learning

Weka is free!

Download Weka at: https://waikato.github.io/weka-wiki/downloading_weka/

You may use them both inside and outside Aalto network

Tutorial videos (**4 hours**) are available. Recommend starting your learning process right after the first class.



Requirement: a basic user!



Reviewed February 2019

Mihitha

Computer Software, 201-500 employees

Used monthly for less than 2 years

Review Source: Capterra [i](#)

OVERALL RATING

 4

EASE OF USE

 4

VALUE FOR MONEY

 4

CUSTOMER SUPPORT

 4

FUNCTIONALITY

 4

best way to data mine and get graphically

Overall experience with weka is good. first I worked with weka for my university assignments. At that time I am not familiar with that. but in very small time period I was able to work with this environment because it is easy for handle. It gives very clear graphical details and those graphical details are very attractive. weka is the best software to do data mining.

PROS

We can use this as very easily for designe data mining algorithms. This software gives very clearly graphical out puts. Very easy to work with software because there is no anything have to do very hard. it is user friendly also. It helps to user solve their problems and get quality predictions. no any breaking points. as well as there are no any kind of mistakes. This software is very helpfull to me for do my datamining tasks. as a student and a employee.

CONS

This software is mainly use for data mining using algorithms. So at that time if we can create this much more user friendly that is the best this ever do. But now also there is no big issue with that.

Pros of Weka

Please estimate how long it will take you to implement five different machine learning algorithms on one ready-to-use dataset via R or Python and compare the performance of these five algorithms.

Please submit your answer at: <https://presemo.aalto.fi/bic/>

Course book

Course book and other research paper and material provided during the course.

Carl Anderson (2015) Creating a Data-Driven Organization: Practical Advice from the Trenches, O'Reilly.

The course book (e-book) is available at the university library.

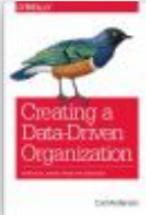
O'REILLY



Creating a
Data-Driven
Organization

PRACTICAL ADVICE FROM THE TRENCHES

Carl Anderson



BOOK

Creating a data-driven organization : practical advice from the trenches

Anderson, Carl (Data scientist), author.

2015

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LINKS

O'Reilly Online Learning: Academic/Public Library Edition

DETAILS

Käyttö edellyttää tunnistautumista Aalto-yliopiston sähköpostiosoitteella.

[SHOW TERMS OF USE](#)



TAGS

A valid Aalto University email address is needed to log in.

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EASYBIB



ENDNOTE



MENDELEY



REFWORKS



PRINT



CITATION



PERMALINK

Guest speaker: Dr. Robin Wikström



**Head of Business
Intelligence, F-Secure**

- Studied Information Systems at Åbo Akademi (Bachelor/Masters)
- Defended my PhD in 2014 at Åbo Akademi, research interested I would is mainly how to utilize data in any forms for decision making purposes, how to create value from data and to find the real values of implementing analytics, AI, ML..
- Worked as a researcher and consultant after my studies for a couple of years in Turku
- Since 2016-> Been working at F-Secure, currently Heading the Business Intelligence initiative/team. Trying to push F-Secure towards the future in regard to data utilization

Guest speaker: Prof. József Mezei



**Professor,
Åbo Akademi University**

József Mezei has received his PhD in Information Systems from Åbo Akademi University. Currently he is a Professor in Information Systems, Åbo Akademi University.

He is a Docent at the School of Business and Management at Lappeenranta University of Technology specialized in financial modeling. He is a co-author of more than 90 peer-reviewed research papers. His current research interests focus on analytics, machine learning solutions in the health care domain, decision making with imprecise information, and fuzzy optimization.

Guest speaker: Mr. Janne Lind



**Lead Solutions
Engineer at Tableau
Software**

Extremely skilled in the field of business intelligence, data discovery and data visualization. Superior client facing skills, always seeking and finding a solution for clients needs. Ready to take ownership, drive challenging situations into solutions and to utilize the wider team when needed. Trusted advisor for many clients in Nordics. Broadly respected by the clients, BPs and colleagues, a real "go-to" guy.

Guest speaker: Mr. Juha Teljo



**Vice President of Solution
Engineering in EMEA,
Tableau / Salesforce**

Mr. Juha Teljo has over 30 years of experience in various areas of business analytics and AI, Business Intelligence and performance management. He is an experienced professional and leader with wide experience in business intelligence and analytics market. He has a technical background and skill set but has worked on various leadership roles and managed several successful teams of both technical and sales professionals. Juha is also a well-known inspirational speaker and an evangelist in the areas of big data, analytics, IoT and cognitive computing and presents regularly in Europe and rest of the world.

Learning objectives of the class

1. What is BI?
 - Categories of Different BI Activities
2. Aims of BI
3. Side Effects of Being Extremely Data-driven

A!

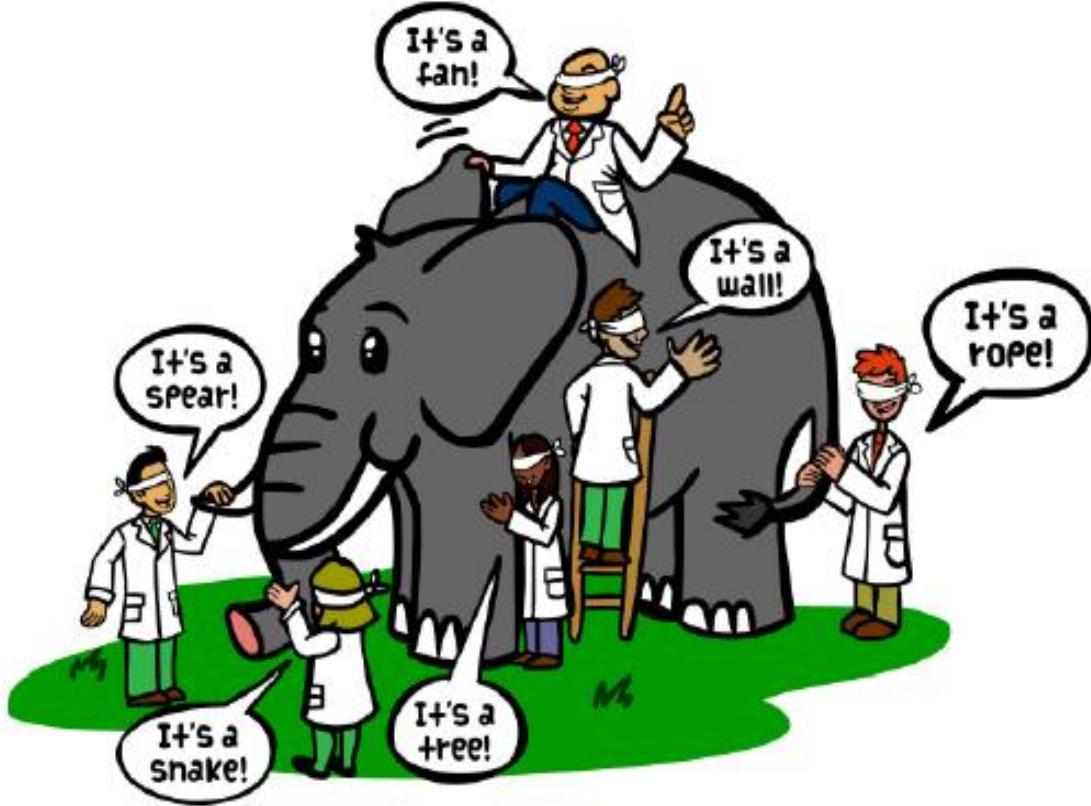
Aalto University
School of Business

Section 1. What is BI?



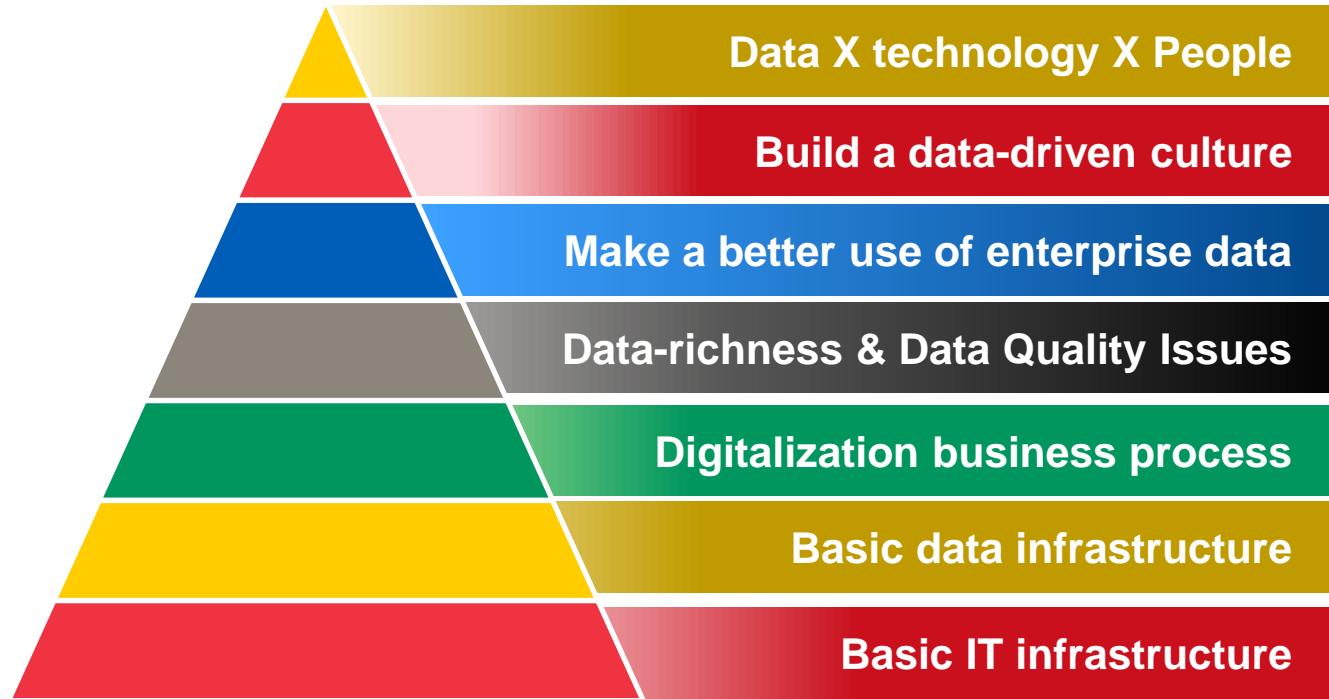
What is BI? - Wikipedia

Business intelligence (BI) comprises the strategies and technologies used by enterprises for the data analysis of business information. Common functions of business intelligence technologies include reporting, online analytical processing, analytics, dashboard development, data mining, process mining, complex event processing, business performance management, benchmarking, text mining, predictive analytics, and prescriptive analytics.



How do different companies develop/utilize business intelligence?

Explaining disparity in BI understanding



Explaining disparity in BI understanding: Types of BI activities

- **Excel-based BI activities**
- **Self-service BI-based activities**
- **Customer Analysis (Customer segmentation, customer lifetime values, etc)**
- **E-commerce**
- **BI as a product or service**
- **BI for machinery (BI outside office)**
- **Optimization research**

Basic analytics (sum, average, grouping)

Business Analytics (regression, Clustering, predictive modeling)

A/B tests

Machine learning / AI

Sensor data analytics

Types of BI activities

- Excel-based BI activities
- Self-service BI-based activities

Basic analytics (sum, average, grouping)

- Customer Analysis (Customer segmentation, customer lifetime values, etc)

Business Analytics (regression, Clustering, predictive modeling)

- E-commerce

A/B tests

- BI as a product or service

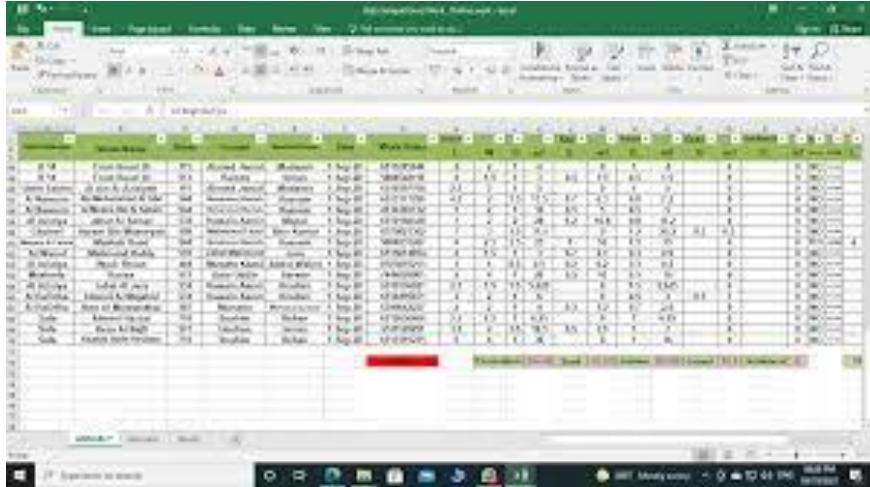
Machine learning / AI

- BI for machinery (BI outside office)

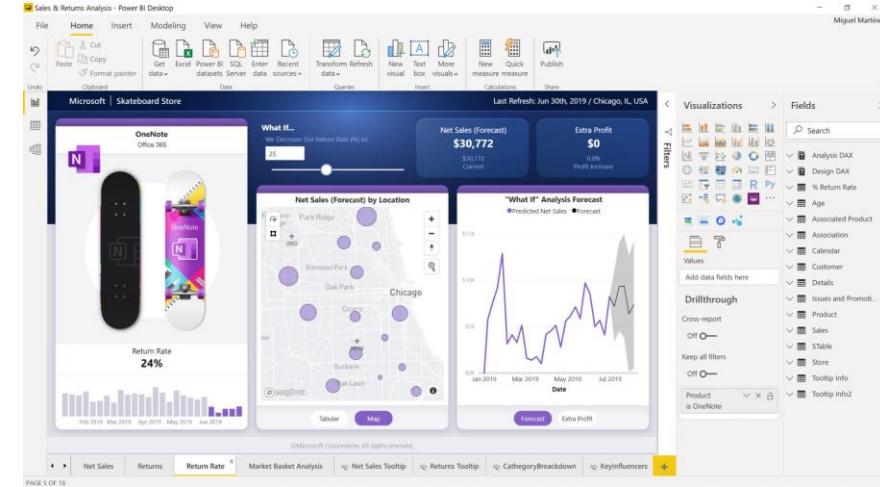
Sensor data analytics

- Optimization research

Basic analytics



1. Use of Excel



2. Use of Power BI



Customer analysis: Business analytics

Business analytics are mainly used for customer analysis and marketing-relevant

- **Customer segmentation**
- **Customer Lifetime Value Analysis**
- **Others**
 - Propensity score matching
 - Difference in difference analysis, etc.



Marimekko's Q1 profits double year-on-year

The iconic Finnish design house says expanding its e-commerce presence has boosted sales worldwide.



Marimekko is known for simple, colourful fabric designs. Image: Laura Ukkonen / Lehtikuva

YLE NEWS

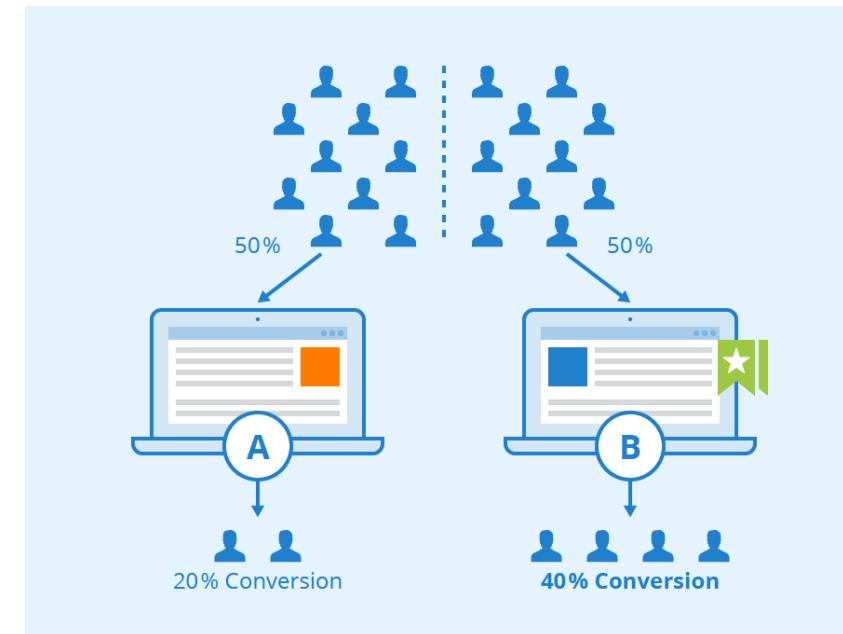
16.5.2019 16:45 • Updated 16.5.2019 16:49

Share

Finnish design, clothing and textile firm Marimekko announced Thursday that its operating profit had doubled during the first quarter of 2019 compared to Q1 in 2018. Between January and March, the firm's operating profit rose to 2.6 million euros, a growth of more than 1.2 million euros compared to the same period last year.

E-commerce: A/B test

An e-commerce company uses an A/B test to improve webpage design based on comparing the web traffic of the A/B test.



<https://yle.fi/a/3-10786646>

https://www.seobility.net/en/wiki/AB_Testing

'Moneyball For Law' Prediction Startup, Ex Parte, Bags \$7.5m

1st March 2022 · artificiallawyer · Litigation Prediction · 1



We're using artificial intelligence and machine learning to predict the outcome of litigation and provide our customers with a winning advantage.

Ex Parte, a 'Moneyball for Law' startup, has bagged \$7.5m in Series A funding. It says that it can 'forecast the outcome of cases with approximately 85% accuracy' – which this site has to say seems doubtful in all but the simplest of cases, but is happy to be proved wrong.

The US company, which got going in 2017 and has four staff listed on LinkedIn, also claims to be 'the world's first company to leverage AI to predict the outcome of litigation'. But, we also have Premonition, which makes... (er... made?), very similar claims in the past and officially started back in 2014.

AI and Machine Learning as a product or service!

.... *Data engineering, strategies ... are lacking importance.*

VentureBeat



Security ▾ Data Infrastructure ▾ Automation ▾ Enterprise Anal

This AI judge correctly predicts court case results 80% of time

A team of computer scientists and legal professionals has created artificial intelligence with the ability to accurately predict the outcome of 79 percent of cases decided upon by the European Court of Human Rights.

The performance of the artificial intelligence was published Monday by [PeerJ Computer Science](#).

26.2.2024

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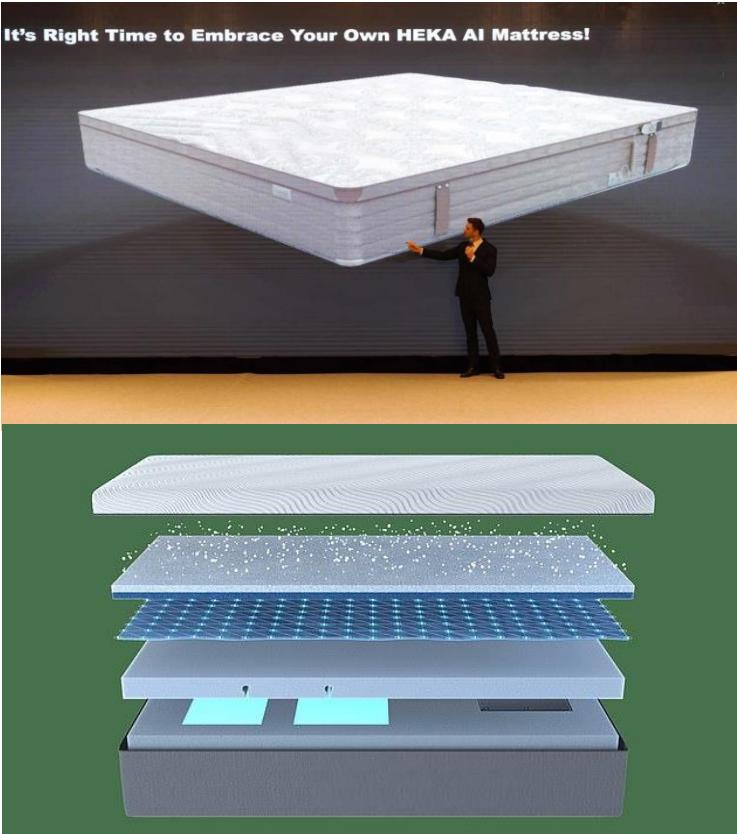
<https://venturebeat.com/business/this-ai-judge-correctly-predicts-court-case-results-80-of-time/>

<https://www.artificiallawyer.com/2022/03/01/moneyball-for-law-prediction-startup-ex-partre-bags-7-5m/>

Never wake up on the wrong side of bed again! AI MATTRESS uses 360 motion sensors to detect movement and readjusts to ensure you're in the most comfortable position

- The Emma Motion mattress moulds to the sleeper's body during a night's sleep
- It's described as the 'most advanced smart mattress' with built-in AI technology
- Emma Motion uses network of 360 motion sensors to sense changes in pressure

It's Right Time to Embrace Your Own HEKA AI Mattress!



26.2.2024

<https://www.dailymail.co.uk/sciencetech/article-9223781/New-AI-mattress-uses-360-degree-motion-sensors.html>

<https://sleepopolis.com/news/heka-launches-ai-mattress/>

https://mp.ofweek.com/Upload/News/Img/member52128/202205/wx_article_bde25ccdb1102b154f284b16481dd97.jpg

<https://www.psychologicalscience.org/news/motr/autopilot-training.html>

BI with large machinery



BI for large mining machines

Background: Because the cost is very high, large mining machines are scheduled to *operate* as ‘fully’ as possible in order to recover its costs and become profitable.

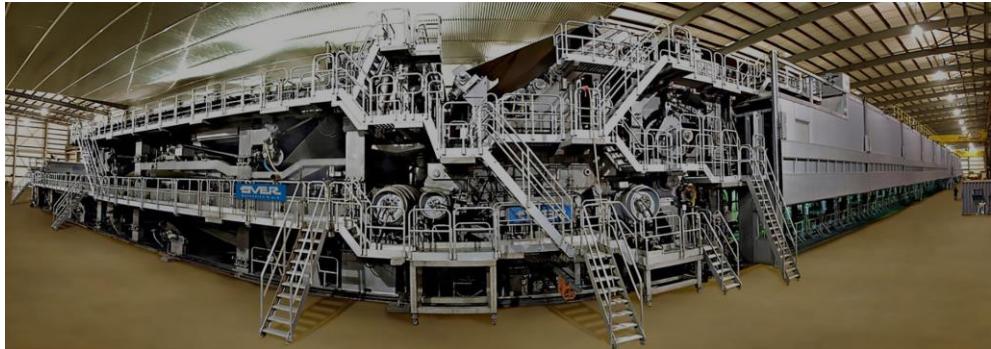
Small problems at different part of machines can be accumulated to eventually cause failures, leading to loss of valuable human life and damage to mining machinery.

Traditional solutions are inefficient – Smelling, touching and observing the machine, and tasting the lubricant oil have been traditional way of detecting the problem.

BI solution: Sensors monitoring different parameters of condition in machinery (vibration, temperature, oil pressure, etc.) in order to identify any significant change, which is indicative of a developing fault.

Sensor data for BI and tacit knowledge

- Tacit knowledge is the kind of knowledge that is difficult to transfer to another person by means of writing it down or verbalizing it.
- A paper machine can produce paper of varied quality. An experienced engineer is needed to control the machine, adjusting attributes like input of chemical materials, speed, temperature, pressure, etc.
- Sensor data and BI can be used to monitor the performance of machine, and to determine a proper operation of the machine.





Is the optimization of Battery production at CATL a BI practice or not?

The production line serves the dual purpose of manufacturing batteries and charging them to ensure they do not contain insufficient electricity.

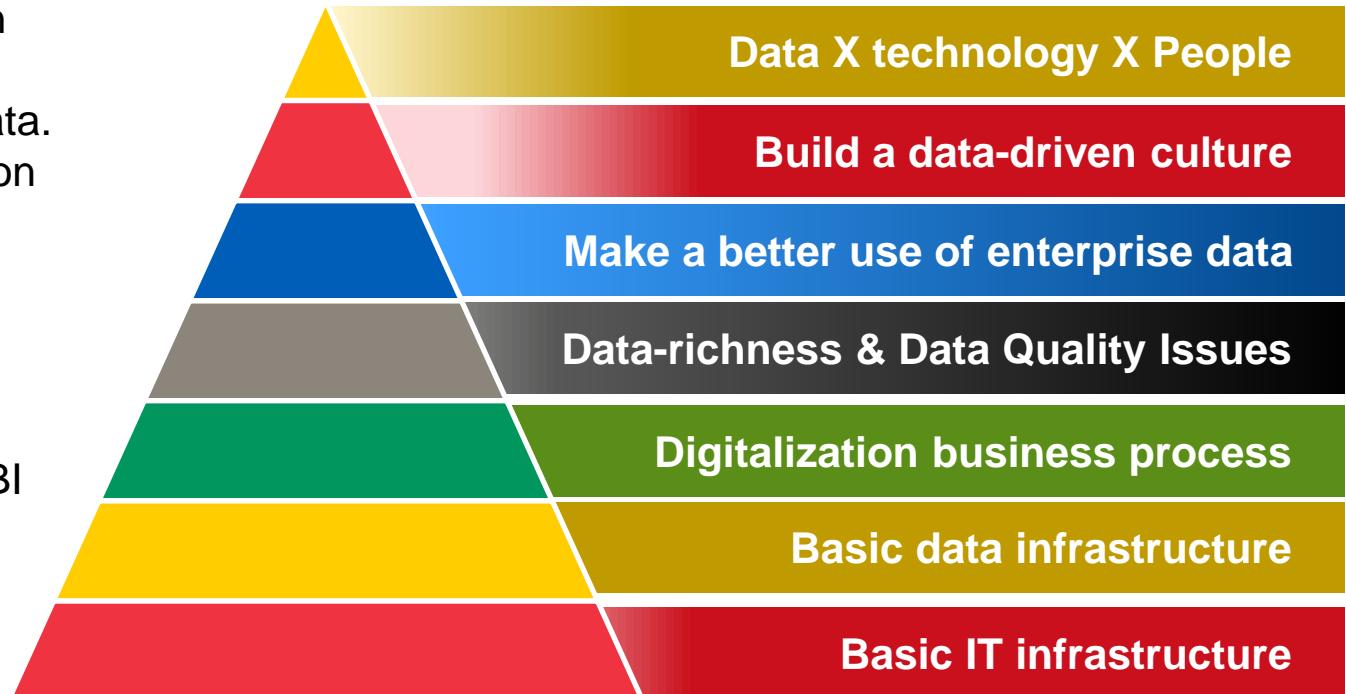
What is your definition of business intelligence?

Please submit your answer at: <https://presemo.aalto.fi/bic/>

We need to have a consensus on what BI is, so that we can talk on the same page!

What is BI?

Business Intelligence (BI) is a **natural outcome of enterprise evolution**, driven by the increasing digitization and growing availability of data. While BI relies on a foundation of proper IT and data infrastructure, having these elements in place does not automatically ensure that a company is proficient in utilizing BI. This is because BI is more of a **management challenge** involving people, rather than being solely a technical issue.



What is BI?

Types of BI activities

- Excel-based BI activities
- Self-service BI-based activities
- Customer Analysis (Customer segmentation, customer lifetime values, etc)
- E-commerce
- BI as a product or service
- BI for machinery (BI outside office)
- Optimization research

Basic analytics (sum, average, grouping)

Business Analytics (regression, Clustering, predictive modeling)

A/B tests

Machine learning / AI

Sensor data analytics

Key takeaway (1)

Business Intelligence (BI) is a **natural outcome of enterprise evolution**, driven by the increasing digitization and growing availability of data. While BI relies on a foundation of proper IT and data infrastructure, having these elements in place does not automatically ensure that a company is proficient in utilizing BI. This is because BI is more of a **management challenge** involving people, rather than being solely a technical issue.

Types of BI activities

- | | |
|--|--|
| <ul style="list-style-type: none">• Excel-based BI activities• Self-service BI-based activities• Customer Analysis (Customer segmentation, customer lifetime values, etc)• E-commerce• BI as a product or service• BI for machinery (BI outside office)• Optimization research | <p>Basic analytics (sum, average, grouping)</p> <p>Business Analytics (regression, Clustering, predictive modeling)</p> <p>A/B tests</p> <p>Machine learning / AI</p> <p>Sensor data analytics</p> |
|--|--|

Key takeaway (2)

- A company does not need a complex of advanced IT or analytic technologies to apply business intelligence successfully.
- Business Intelligence practices for an e-commerce department (company) and a non-e-commerce department (or company) differ greatly.
- Applications of AI and machine learning as a product or service indicates that the use of advanced analytics tool does not necessarily affect internal enterprise management.

A!

Aalto University
School of Business

Section 2. Aims of BI



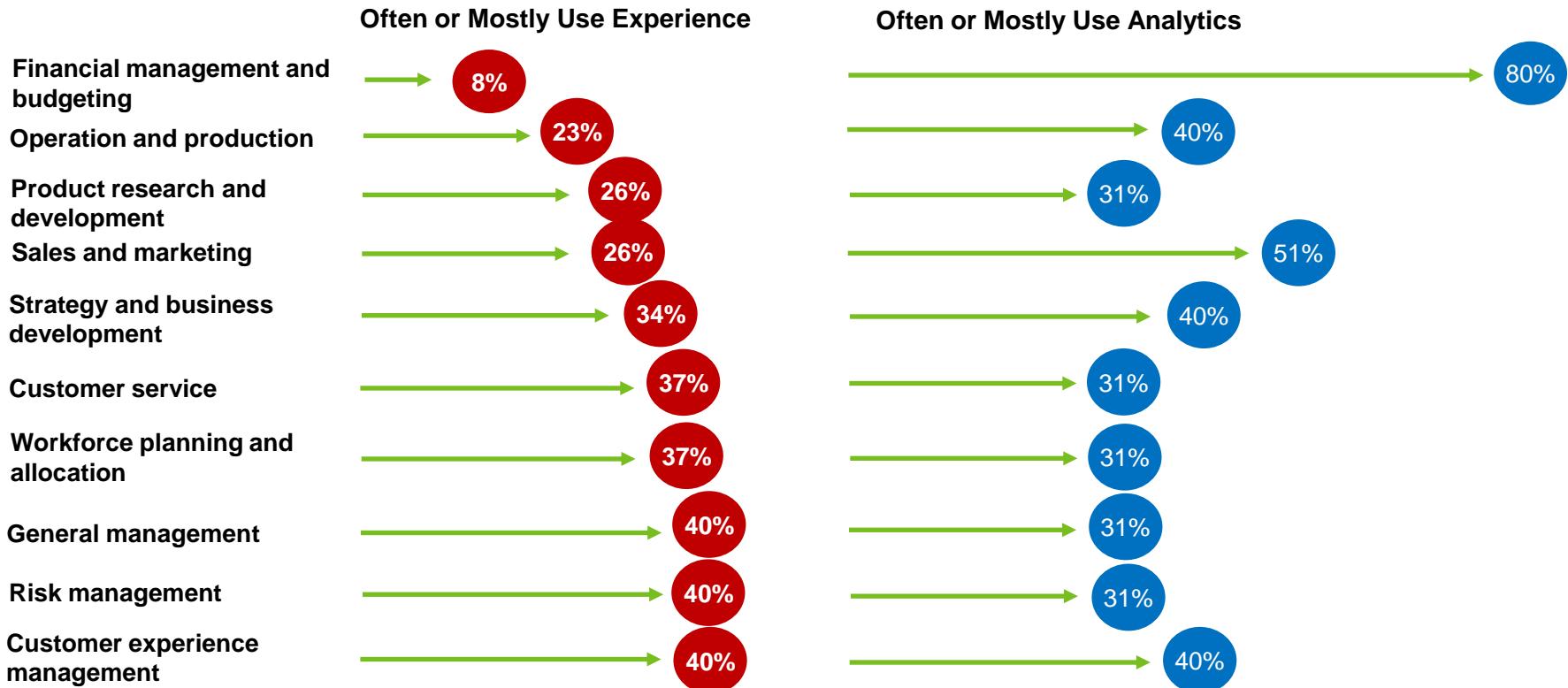
How do non-data-driven companies make decisions?

- Non-data-driven organizations rely heavily on **intuition** and **established, traditional methods** for decision-making.
- **“We did this also last year.”**
 - *How should we do the Christmas marketing campaign this year?*
 - *Let's do the same as what we did last year*
- **Intuition is often difficult to reject!**
 - *A company spent one million on an industrial event to market their product because the marketing department's head decided so.*

Prevalence of Experience-based Decision Making

Most analytics have been applied to financial management and budgeting, but other business analytics received less analytics support!

80% of financial management and budgeting and 51% of sales and marketing are mostly or often driven by analytics, but 40% of general management, risk management and customer experience management are driven by experience-based decision making.



What are the aims of enterprises doing business intelligence?

What is the aim of enterprises doing business intelligence?

- “The purpose of business intelligence in a business is to help corporate executives, business managers, and other operational workers make **better and more informed business decisions**.”
- “Business intelligence is the process of surfacing and analyzing data in an organization to **make informed business decisions**.”
- “The goal of a BI system is to give stakeholders a clear and customized view of their data to empower them to **make data-driven decisions**.”

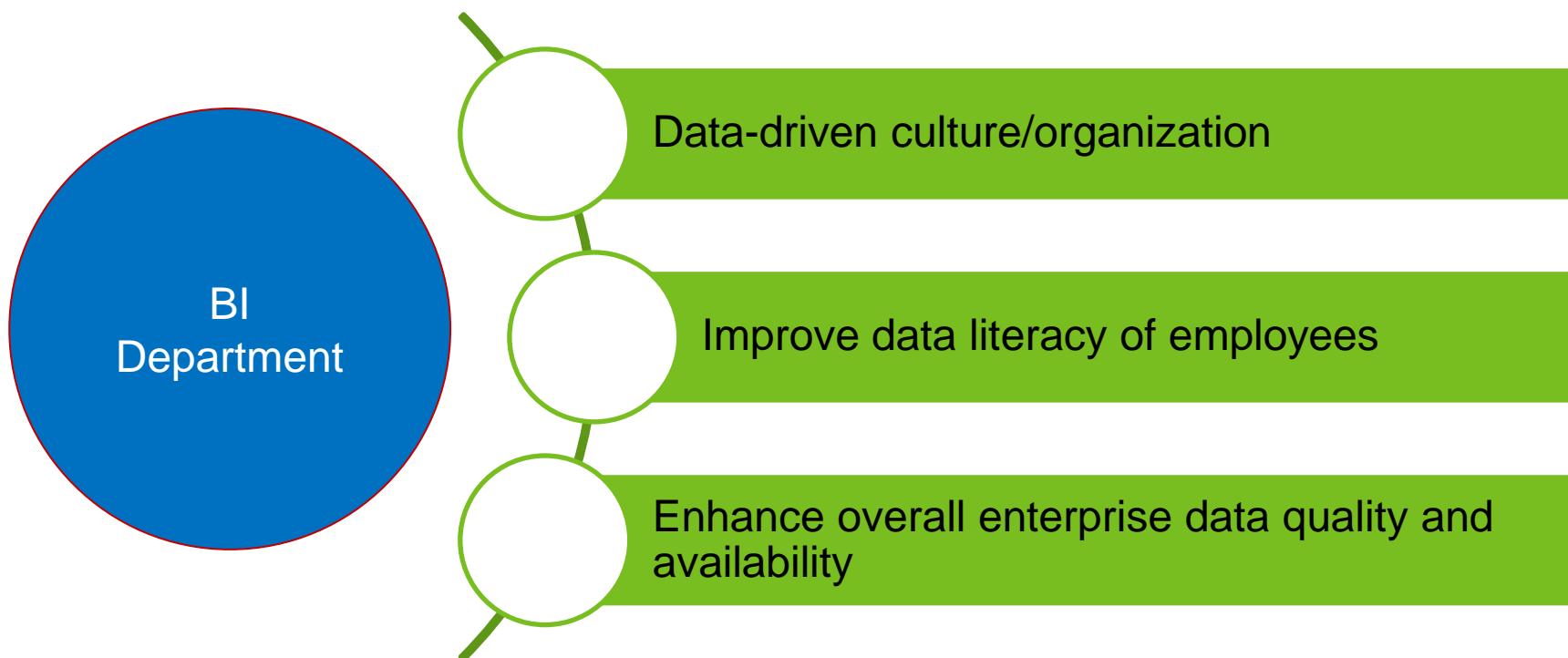
Doing business intelligence is never the aim of an enterprise; it is an instrument for **achieving informed business decisions**.

Data-driven culture

Data-driven organization

“A data-driven organization is one that effectively and consistently utilizes data in their decision-making process across all levels of the organization.”

Aims of Enterprises Doing BI



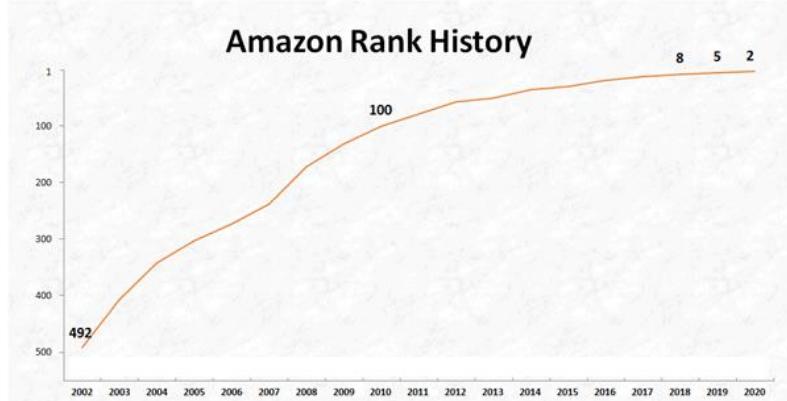
BI Department Header

Chief Data Officer

Why do companies eager to become data-driven?

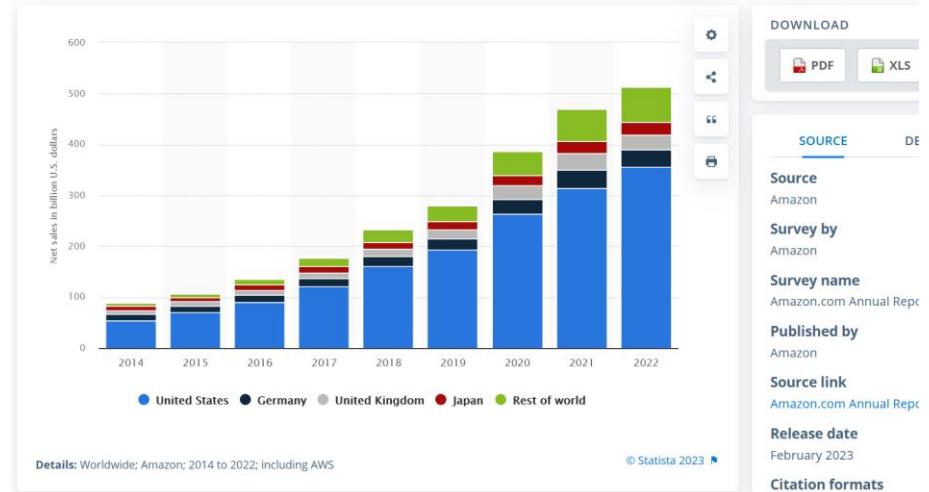
- Amazon
- Reima
- Marimekko

Amazon: What would happen if business becomes highly data-driven?



Rank History of Amazon in the Fortune 500 List

Annual net sales of Amazon in selected leading markets from 2014 to 2022
(in billion U.S. dollars)



Amazon: among the first to implement product recommendation system

Amazon started item-based collaborative filtering in 1998,
The highly powerful recommendation system contributes to 35% of its revenue!

The screenshot shows the Amazon.co.uk homepage with a navigation bar at the top. The main content area features a recommendation section titled "What Do Customers Buy After Viewing This Item?". It lists three items with their purchase percentages: "Football Manager 2008 (PC)" at 81%, "FIFA 08 (PS2)" at 4%, and "Medieval II: Total War - Kingdoms..." at 4%. Below this, there's a "New for You" section with book covers for "James Patterson" and "Stephen King". To the right, there are promotional boxes for "You Know You Want It" (travel speakers) and an "Exclusive Sky Offer" (gift certificate). The footer includes a "50% off install" offer and a date "26.2.2024".

Hello Damian. We have [recommendations](#) for you. (Not [Damian](#)?)

We've had a redesign. [Take a look.](#)

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Books >
Music, DVD & Games >
Electronics & Computing >
Home & Garden >
Baby, Children & Toys >
Jewellery & Watches >
Shoes >
Sports & Leisure >

Search

What Do Customers Buy After Viewing This Item?

81% buy the item you viewed 4% buy this alternative 4% buy this alternative

Football Manager 2008 (PC)

FIFA 08 (PS2)

Medieval II: Total War - Kingdoms...

You Know You Want It

GZ- Travel Charger for... Enjoy high quality stereo sound with these compact travel speakers. [Read more](#)

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Exclusive Sky Offer

Free £50 Amazon.co.uk Gift Certificate

When you [join Sky TV](#) from just £16 a month

50% off install

Data Driven: What Amazon's Jeff Bezos Taught Me About Running a Company

A former employee of the retailer reflects on the lessons learned from the boss of the web giant.



BY **DAVID SELINGER** • SEP 11, 2014

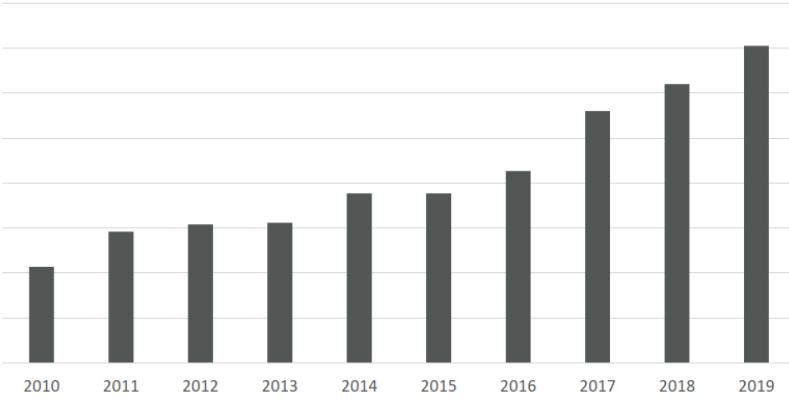
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Opinions expressed by Entrepreneur contributors are their own.

1. Metrics define your corporate culture. More than anyone I've ever met, Bezos knew that things don't improve unless they're measured. At Amazon, everything that can be measured is. Every piece of data is tested and analyzed -- not just web design or product features, but finance, HR and operations processes.

Reima



Source: the Head of Europe, Heikki Lempinen, Reima
With permission from the Head of Europe, Heikki Lempinen, Reima

Marimekko's Q1 profits double year-on-year

The iconic Finnish design house says expanding its **e-commerce** presence has boosted sales worldwide.



Marimekko is known for simple, colourful fabric designs. Image: Laura Ukkonen / Lehtikuva

YLE NEWS

16.5.2019 16:45 • Updated 16.5.2019 16:49

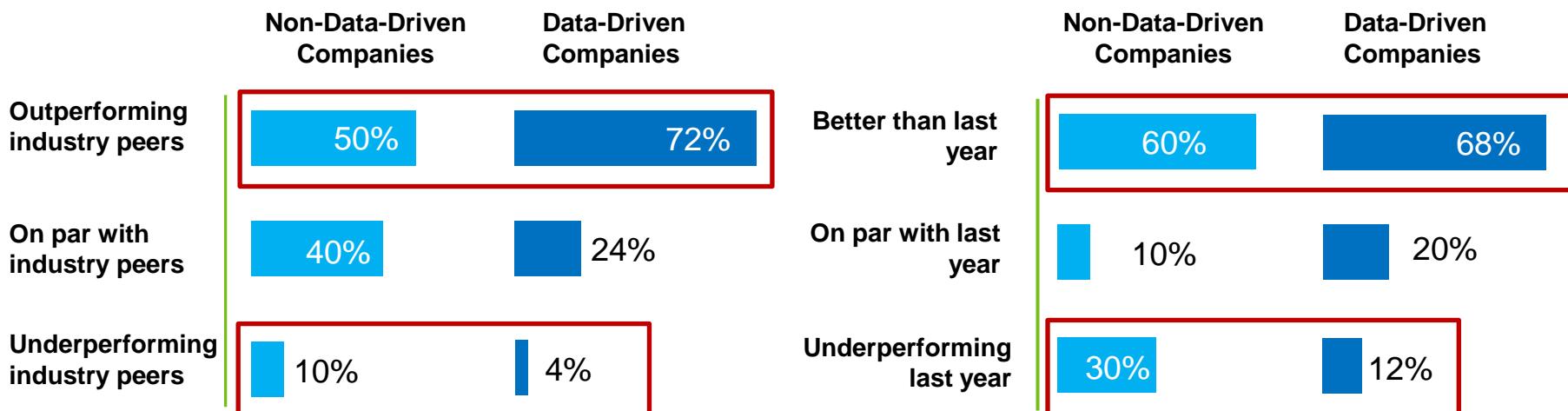
Share

Finnish design, clothing and textile firm Marimekko announced Thursday that its operating profit had doubled during the first quarter of 2019 compared to Q1 in 2018. Between January and March, the firm's operating profit rose to 2.6 million euros, a growth of more than 1.2 million euros compared to the same period last year.

Being Data-Driven is the Future!

Data-driven Finnish Companies Associated with Competitiveness and Better Performance

25 of participating companies (71%) are classified as data driven. Data-driven Finnish companies are more likely (72%) to outperform industry peers and gain better business performance (68%) than last year. Non-data-driven companies ($N = 10$) are more likely to underperform industry peers (10%) and to underperform last year (30%).



MIT Sloan management Review (2010)

Results of surveying over 3,000 executives, managers and analysts across more than 30 industries in 108 countries

Organization's competitive position where the possible responses were:

1. Substantially outperform industry peers
2. Somewhat outperforming industry peers
3. On par with industry peers
4. Somewhat or substantially underperforming industry peers

compared to lower performers, top performers were:

- Five times more likely to use analytics
- Three times more likely to be sophisticated analytics users
- Two times more likely to use analytics to guide day-to-day operations
- Two times more likely to use analytics to guide future strategies

“Companies [...] in the use of data-driven decision-making were, on average, 5% more productive and 6% more profitable than their competitors.”



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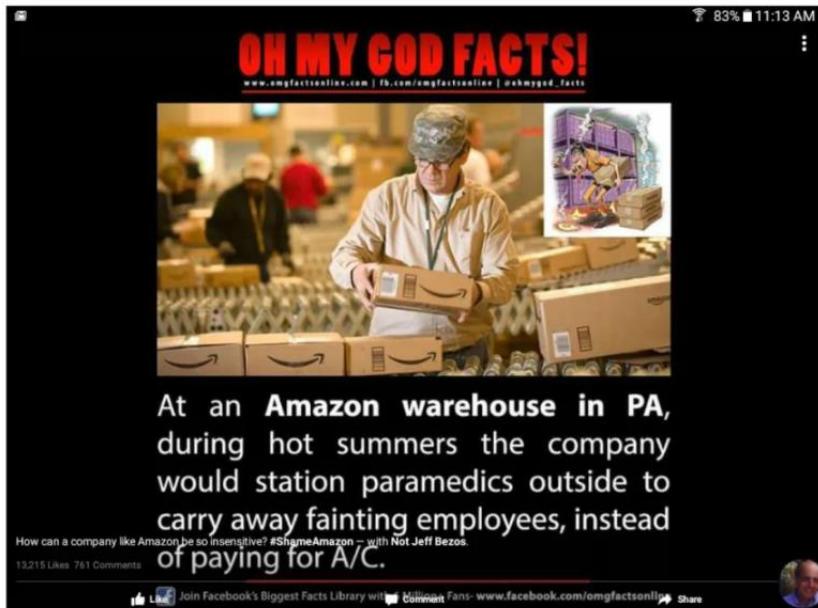
Section 3. Side Effects of Being Extremely Data-driven



Connecting worker performance with KPIs

<https://www.snopes.com/fact-check/amazon-paramedics/>

On 15 August 2015, the *New York Times* published an in-depth, widely discussed piece about online retailing giant Amazon.com titled "Inside Amazon: Wrestling Big Ideas in a Bruising Workplace" (subtitled "The company is conducting an experiment in how far it can push white-collar workers to get them to achieve its ever-expanding ambitions").



<https://www.thehealthyjournal.com/faq/is-amazon-stressful-to-work>

Is Amazon stressful to work?

"While it has been an incredibly rewarding place to work, the pressure often feels relentless and at times, unnecessary.

⚠️ Takedown request | View complete answer on [bloomberg.com](https://www.bloomberg.com)

How stressful is it to work at Amazon?

High stress

Other critics say Amazon sets unreasonably high production quotas for its warehouse workers, creating constant stress. Amazon keeps track of how long it takes pickers to pull items from shelves and put them on a bin. Workers who fail to meet the rates set by the company to pull items risk losing their jobs.

⚠️ Takedown request | View complete answer on [syracuse.com](https://www.syracuse.com)

How long do most people stay at Amazon?

The average Amazon warehouse worker leaves within just eight months – that's an unmistakable sign that Amazon's jobs are unpleasant, to put it kindly, and that many Amazon workers quickly realize they hate working there because of the stress, breakneck pace, constant monitoring and minimal rest breaks.

⚠️ Takedown request | View complete answer on [theguardian.com](https://www.theguardian.com)

Data-driven management of workers

US & WORLD / POLICY / REPORT

How Amazon automatically tracks and fires warehouse workers for ‘productivity’



Illustration by Alex Castro / The Verge

/ Documents show company tracks workers

By Colin Lecher

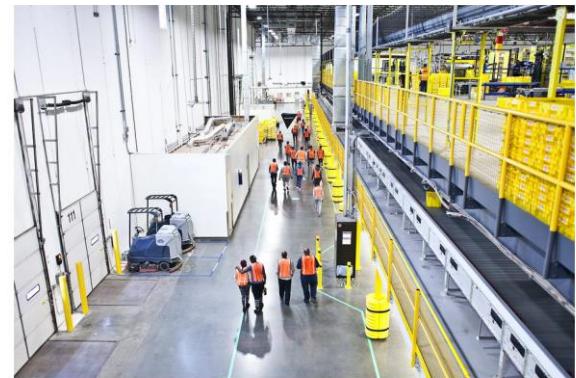
Apr 25, 2019, 7:06 PM GMT+3 | ▾



The New York Times

If Workers Slack Off, the Wristband Will Know. (And Amazon Has a Patent for It.)

Share full article 118



Employees at an Amazon warehouse in Carteret, N.J. The e-commerce giant has been known to experiment in-house with new technology before selling it worldwide. Bryan Anselm for The New York Times

What is your opinion?

If your company proposes the establishment of Key Performance Indicators (KPIs) for employee management, would you, as the head of the Business Intelligence department, endorse such an initiative? For example, in the context of a retail chain with a sales team comprising 50 individuals, the CEO recommends terminating the employment of the salesperson with the lowest monthly sales revenue, and the company will do it every month dismissing one salesperson. Would you be in favor of or opposed to this suggestion?

Please submit your answer at: <https://presemo.aalto.fi/bic/>