Data omzetten in waarde: van toeval naar vaardigheid

Prof.dr.ir. Remko Helms
Open University – Beta faculty

BouwKennis Congres
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Bit of my background

- Professor in Information Systems at Open Universiteit (OU)
  - Background in Physics and Management Science, focus ICT
- Program leader of Bachelor in Information Science at OU
- Vice dean of education Beta faculty
- Developed Data Science Management master program
  - 155 students started in September 1, 2017 (66 in 2016)
  - Variant of Business Process Management & IT master at OU
- Research interests: organizational and managerial aspects of data analytics
Open innovation, Co-creation and Education
Supporting the Digital Age
Data has a better idea
BIG data

- Volume
- Velocity
- Variety
- Veracity
- Value
- Variability
Data science

• An interdisciplinary field of science
• Aimed at extracting knowledge from data
• Fields of science involved:
  – Computer Science
  – Information science
  – Statistics
  – Mathematics
• Term already coined in 1960s
Data Analytics techniques

- Machine learning (AI)
- Deep learning (AI)
- Neural networks (AI)
- Clustering
- Classification
- Network analysis
- Regression
Why bother?

• “Top-performing organizations use analytics five times more than lower performers”\(^1\)

• Research shows that companies applying data analytics are 5 to 6% more productive and profitable\(^2\)


No one size fits all

• Many different applications of data analytics

• Using different data sources and data types
Weesfietsen
What makes you watch?
The problem
Project highlights
Deep Solaris

Using artificial intelligence to detect solar panels and their dimensions
Classification + Localization

Often pretrained on ImageNet (Transfer learning)

Treat localization as a regression problem!
Using artificial intelligence to detect micro cracks on SEM imagery of steel
Computer vision becomes commodity

- Potential application: Easy finding and ordering of spare parts at construction site
Vera

Using artificial intelligence to detect stress of service agents
Generating your own data: IoT

• Integrating sensors in products to collect data
  – Motion sensors in lights or ceiling panels to monitor user flows in buildings
  – Monitor use of equipment to predict maintenance (e.g. stress sensors in bridges)
  – Monitor product usage and personalize lighting and heating in workplaces
Hiring data scientists

**Data Scientist**

ING
Frankfurt

Applied on company website

**Senior Data Scientist**

App Annie
Utrecht Area, Netherlands

Applied on company website

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**Job description**

**Playing a lead role in data analysis**

Want to have a lead role in data analysis? Do you aspire to have a lead role in data analysis and grow your career in banking? Do you want to take data-driven decisions to improve our business? If so, apply at the Advanced Analyst position at ING. You will take a leading role in data analysis, with a focus on big data and machine learning. You will work with experienced data scientists and business analysts to drive meaningful insights and data-driven decisions.

**Job description**

**The Marktplaats Product Insights team drives**

The Marktplaats Product Insights team drives business-critical insights for Marktplaats. You will help develop innovative product and design solutions for Marktplaats business customers every day. Each individual impact big data has on the performance of our business models. You will work with inspired and driven Software and Business Development team members, and take data-driven decisions to the next level for Marktplaats colleagues to join us. Working together with the Marketing team (locally and globally) you will help Marktplaats B2B returns, whilst growing the Marktplaats Zakelijk responsibilities: &bull; You own the data, models, and insights on all business sellers and the product solutions.

**Your role at App Annie**

We are the leader in the hot space of app store data with a mission of building a better app business. You use advanced data models and insights to drive trends, uncover app opportunities, and provide accurate and timely insights. You work closely with in-house data scientists and the business team, combining your expertise in data analysis, statistical modeling, and machine learning.

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**Job description**

Are you passionate for everything to do with data? Are you excited by running your analyses used and valued by world class app builders like Facebook, LinkedIn, Ubisoft, Glu, Tencent, King...? Do you love to solve challenging problems and create innovative yet pragmatic solutions? Great! If you can also build and train models while being able to explain that to non-data heads, then we want you!

Your role at App Annie

1. Developing and implementing data-driven strategies to improve the performance of our products and services
2. Collaborating with cross-functional teams to drive data-driven decision-making
3. Building and maintaining predictive models to support business goals
4. Analyzing large datasets to identify patterns and trends
5. Communicating findings and insights to stakeholders in a clear and actionable manner

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**Job description**

Are you a data scientist looking for an exciting opportunity to apply your skills in a fast-paced, data-driven environment? Look no further! Our company is seeking a Senior Data Scientist to join our team. In this role, you will work closely with product managers, data analysts, and engineers to build and deploy predictive models that drive business outcomes.

1. Developing and implementing data-driven business intelligence models
2. Collaborating with cross-functional teams to drive data-driven decision-making
3. Building and maintaining predictive models to support business goals
4. Analyzing large datasets to identify patterns and trends
5. Communicating findings and insights to stakeholders in a clear and actionable manner
Superman

• Math & statistics
• Programming
• Databases
• Domain knowledge
• Communication
• Visualization
• Soft skills
Is hiring data scientist enough?

• “While businesses are hiring more data scientists than ever, many companies are struggling to realize the full organizational and financial benefits from investing in data analytics” (Stein, 2015)

Building a data analytic capability

Data science process

• Structured approach aimed at converting data into insights into deployable products/services

• But:
  – 82% of the data scientists surveyed do not follow an explicit process (Saltz et al., 2018)
  – “through 2017, 60% of big data projects will fail to go beyond piloting and experimentation, and will be abandoned” (Gartner, 2015)

• Gartner Says Business Intelligence and Analytics Leaders Must Focus on Mindsets and Culture to Kick Start Advanced Analytics. Retrieved from https://www.gartner.com/newsroom/id/3130017
Survivor bias
User-friendly Analytics tools
Data science process

CRISP - DM

- Business understanding
- Data understanding
- Data preparation
- Model building
- Testing & evaluation
- Deployment

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Spurious correlations

The real cause of increasing autism prevalence?

Sales ($millions) vs. Individuals Diagnosed

Year

Sales


300,000

200,000

100,000

0

25,000

20,000

15,000

10,000

5,000

0

Autism

Organic Food Sales

r = 0.9971 (p < 0.0001)


VIA 9GAG.COM
More variables, the worser it gets

This is the tragedy of big data: The more variables, the more correlations that can show significance. Falsity also grows faster than information; it is nonlinear (convex) with respect to data (this convexity in fact resembles that of a financial option payoff). Noise is antifragile. Source: N.N. Taleb
Data science process

CRISP - DM

Business understanding

Data understanding

Data preparation

Model building

Testing & evaluation

Deployment

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Remember Google Flu?
Data Analytics Governance

• Organizing the data analytics function in order to reap the benefits of data

• Governance mechanisms:
  – Structural (centralized vs decentralized)
  – Procedural (decision rights)
  – Relational
Managing the project pipeline

Collaboration between disciplines

Source: McKinsey.com

Data

Analytics

Business

Decision making

Information technology

Data scientists

Analytic consultants

Head of analytics

Data strategists

Business decision making

‘Translator’
Thank you: questions?

- remko.helms@ou.nl
- @remhelms
- www.linkedin.com/in/remkohelms