Strategic Approaches to the Use of Data Science in SMEs

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The Triple Helix Model of Innovation

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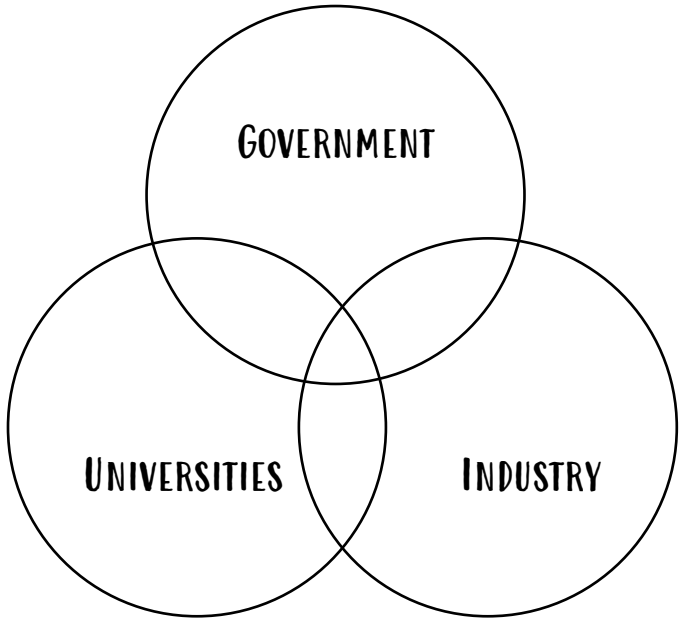

Triple Helix Model of Innovation
H. Etzkowitz, The Triple Helix: University-Industry-Government Innovation in Action. New York, NY: Routledge, 2008.

- Government: sets framework for stable interactions
- Industry: Key for productive and human capital
- Universities: Source of knowledge and know-how

Use-Case Study: Quick Facts

- 12 SMEs in Salzburg
- Different domains (ICT and e-commerce deliberately excluded)
- Received funding for initial digization and/or data science projects

→ No anonymous surveys, but personal in-depth interviews following a fixed schedule

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iTG Innovationsservice für Salzburg

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Questionnaire:
* Feedback funding process
* Digitzation progress
* Data analytics experience
* Machine learning experience

19th – 21st January 2021

schedule video calls!

align with levels of data science maturity model

+ add open questions:
motivation, challenges, risks

Data Science Maturity Model

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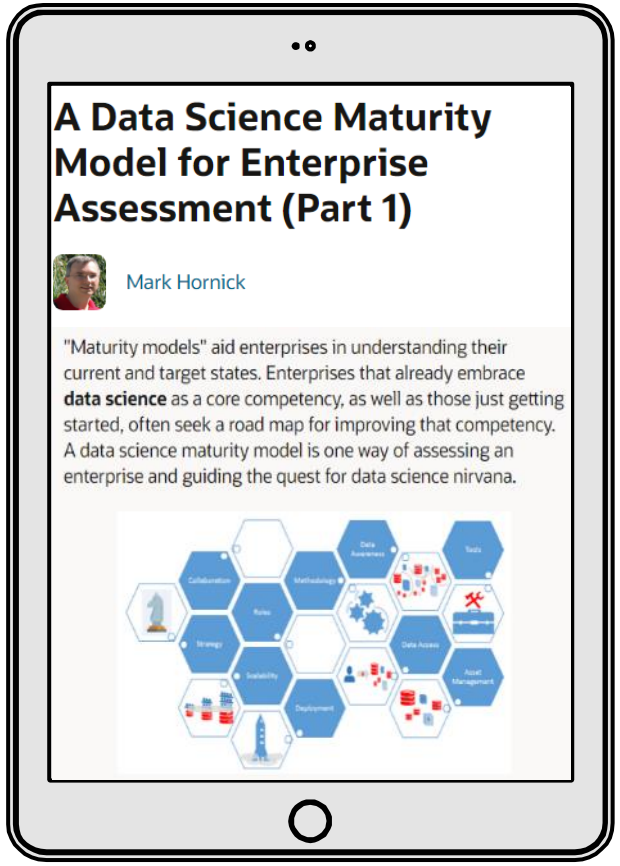


Oracle's Data Science Maturity Model

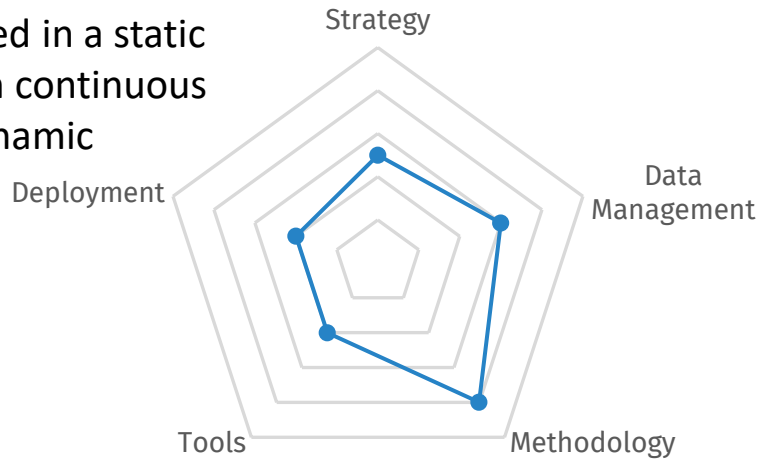
Mark Hornick, *„A Data Science Maturity Model for Enterprise Assessment"*, Whitepaper, 2020.

Strategy

Is data regarded as a by-product or as capital?

Deployment

Are results reported in a static fashion or through continuous deployment of dynamic models?



Data Management

Is data stored locally in the company or outsourced to external providers in a centralized or distributed way?

Tools

Are software packages used to facilitate data handling and how scalable are those?

Methodology

Are methods applied to analyze the past and forecast the future?

Company Profiles

and results from clustering into three groups

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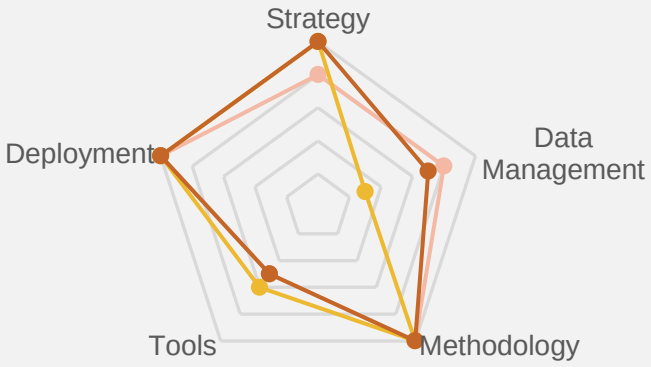
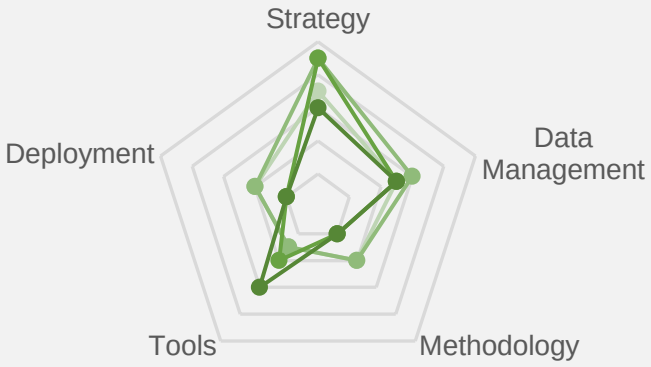
Pioneers

Data-centric business models



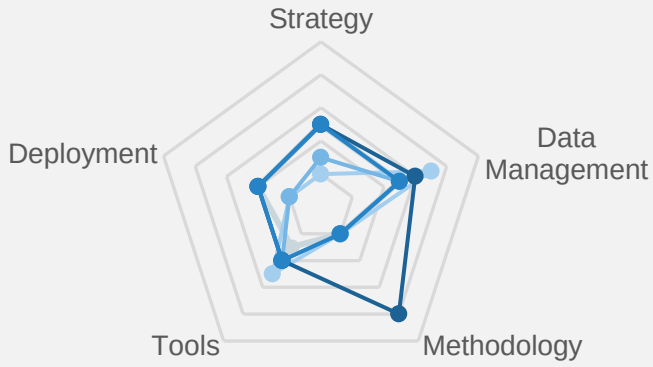
Strategists

Awareness for value of data



Pragmatists

Hands-on approach



Main Challenges

when companies start with data science projects

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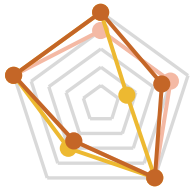

Pioneers

- Legal questions with respect to machine learning
- Infrastructure, equipment
- Acquisition costs
- Application-specific challenges

Strategists

- Workforce quantity and/or lack of specific training
- Cost-benefit analysis
- Costly data management
- Extensive data maintenance

Pragmatists

- Data transparency and security
- Low data volumes („small data“)
- Lacking interfaces to current software
- Lacking overview of methodologies and available software

Types of Data

by volume and source

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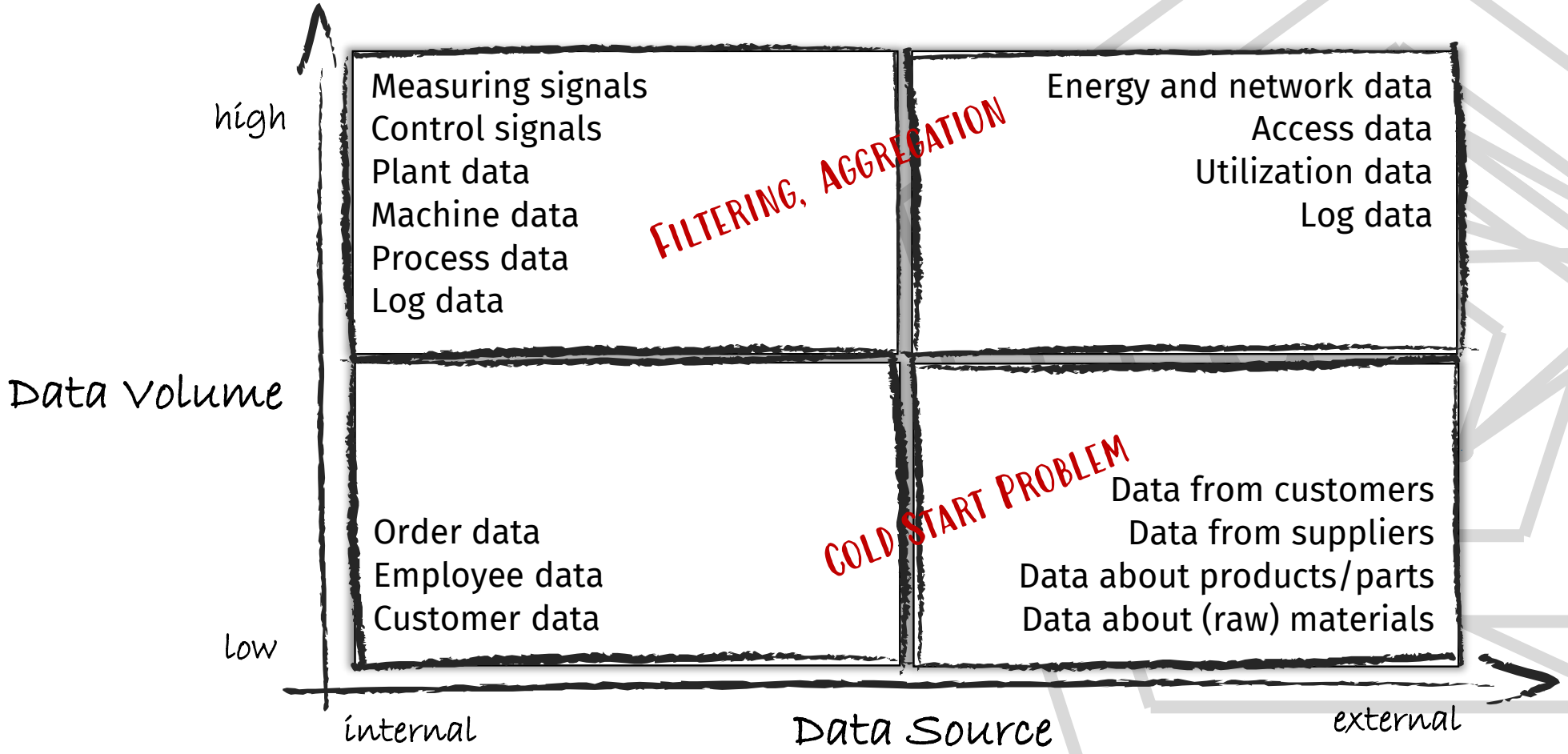

Conclusion
from companies‘ points of view

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1. Data Inventory

- Assess current data science maturity level
- Assess internally available data and possible external dependencies

2. Data Literacy

- More and more jobs require working with data
- Train employees for understanding of data-centric processes

3. Collaboration

- Data science is a team effort
- Collaboration with companies, universities and other research institutions

Lessons Learned

completing the Triple Helix

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Government

- Funding program is effective
- Also fund the provision of data
- Joint application of companies
- Towards open data

Universities

- Collaboration with regional companies
- Different needs than big players
- Interdisciplinary research teams

University-Industry Collaboration

in data science projects at the example of the FHS

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Business Informatics

MASTER | FULL-TIME | GERMAN
IT | BUSINESS/MANAGEMENT
ENGINEERING

Information Technology and Systems Management

MASTER | FULL-TIME | GERMAN
IT | ENGINEERING

Applied Image and Signal Processing

MASTER | FULL-TIME | ENGLISH
IT | ENGINEERING

Collaboration with Universities

- Industry talks
- Internships
- Thesis projects
- Student research projects
- Faculty-level (funded) research

Thank You for Your Attention!

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