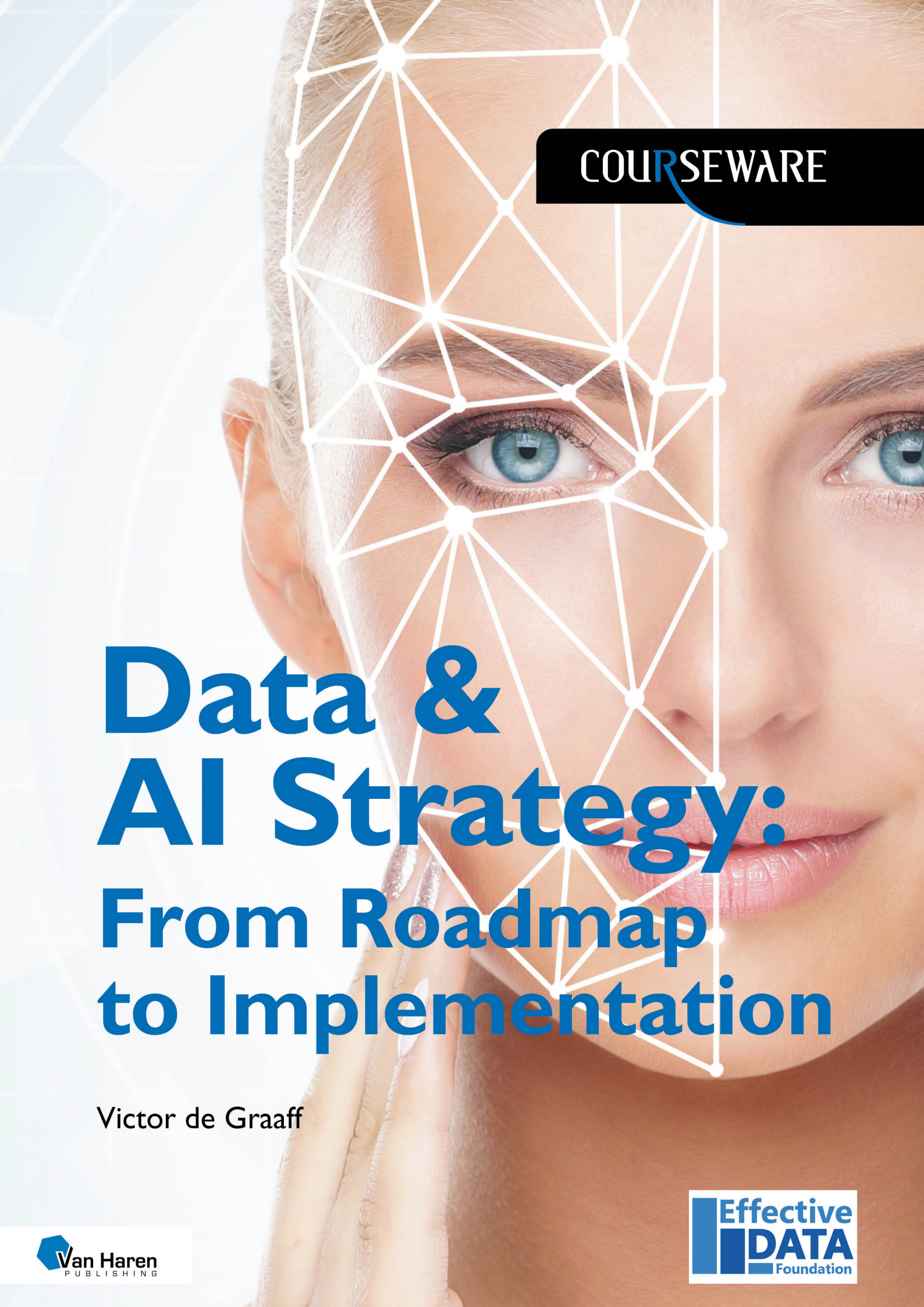

COURSEWARE

Data & AI Strategy: From Roadmap to Implementation

Victor de Graaff

Van Haren PUBLISHING

Effective DATA Foundation

Data & AI Strategy:
From Roadmap to Implementation

Colophon

Title:	Data & AI Strategy: From Roadmap to Implementation
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Publisher about the Courseware

The Courseware was created by experts from the industry who served as the author(s) for this publication. The input for the material is based on existing publications and the experience and expertise of the author(s). The material has been revised by trainers who also have experience working with the material. Close attention was also paid to the key learning points to ensure what needs to be mastered.

The objective of the courseware is to provide maximum support to the trainer and to the student, during his or her training. The material has a modular structure and according to the author(s) has the highest success rate should the student opt for examination. The Courseware is also accredited for this reason, wherever applicable.

In order to satisfy the requirements for accreditation the material must meet certain quality standards. The structure, the use of certain terms, diagrams and references are all part of this accreditation. Additionally, the material must be made available to each student in order to obtain full accreditation. To optimally support the trainer and the participant of the training assignments, practice exams and results are provided with the material.

Direct reference to advised literature is also regularly covered in the sheets so that students can find additional information concerning a particular topic. The decision to leave out notes pages from the Courseware was to encourage students to take notes throughout the material.

Although the courseware is complete, the possibility that the trainer deviates from the structure of the sheets or chooses to not refer to all the sheets or commands does exist. The student always has the possibility to cover these topics and go through them on their own time. It is recommended to follow the structure of the courseware and publications for maximum exam preparation.

The courseware and the recommended literature are the perfect combination to learn and understand the theory.

-- Van Haren Publishing

Other publications by Van Haren Publishing

Van Haren Publishing (VHP) specializes in titles on Best Practices, methods and standards within four domains:

- IT and IT Management
- Architecture (Enterprise and IT)
- Business Management and
- Project Management

Van Haren Publishing is also publishing on behalf of leading organizations and companies: ASLBiSL Foundation, BRMI, CA, Centre Henri Tudor, Gaming Works, IACCM, IAOP, IFDC, Innovation Value Institute, IPMA-NL, ITSqc, NAF, KNVI, PMI-NL, PON, The Open Group, The SOX Institute.

Topics are (per domain):

IT and IT Management

ABC of ICT
ASL®
CATS CM®
CMMI®
COBIT®
e-CF
ISO/IEC 20000
ISO/IEC 27001/27002
ISPL
IT4IT®
IT-CMF™
IT Service CMM
ITIL®
MOF
MSF
SABSA
SAF
SIAM™
TRIM
VeriSM™

Enterprise Architecture

ArchiMate®
GEA®
Novius Architectuur
Methode
TOGAF®

Business Management

BABOK® Guide
BiSL® and BiSL® Next
BRMBOK™
BTF
EFQM
eSCM
IACCM
ISA-95
ISO 9000/9001
OPBOK
SixSigma
SOX
SqEME®

Project Management

A4-Projectmanagement
DSDM/Atern
ICB / NCB
ISO 21500
MINCE®
M_o_R®
MSP®
P3O®
PMBOK® Guide
Praxis®
PRINCE2®

For the latest information on VHP publications, visit our website: www.vanharen.net.

Table of content

Self-Reflection of understanding Diagram

'*What you do not measure, you cannot control*.'' – Tom Peters

Fill in this diagram to self-evaluate your understanding of the material. This is an evaluation of how well you know the material and how well you understand it. In order to pass the exam successfully you should be aiming to reach the higher end of Level 3. If you really want to become a pro, then you should be aiming for Level 4. Your overall level of understanding will naturally follow the learning curve. So, it's important to keep track of where you are at each point of the training and address any areas of difficulty.

Based on where you are within the Self-Reflection of Understanding diagram you can evaluate the progress of your own training.

Level of Understanding	*Before Training (Pre-knowledge)*	*Training Part 1 (1st Half)*	*Training Part 2 (2nd Half)*	*After studying / reading the book*	*After exercises and the Practice exam*
Level 4 *I can explain the content and apply it .*					
Level 3 *I get it!* *I am right where I am supposed to be.*					Ready for the exam!
Level 2 *I almost have it but could use more practice.*					
Level 1 *I am learning but don't quite get it yet.*					

(Self-Reflection of Understanding Diagram)

Write down the problem areas that you are still having difficulty with so that you can consolidate them yourself, or with your trainer. After you have had a look at these, then you should evaluate to see if you now have a better understanding of where you actually are on the learning curve.

Troubleshooting

Problem areas:	*Topic:*
Part 1	
Part 2	
You have gone through the book and studied.	
You have answered the questions and done the practice exam.	

Timetable

Day 1: Foundation & Roadmap

- Introduction to Data & AI Strategy
- Creating the Fundamentals
- Developing a Roadmap
- Hands-on Workshop

Day 2: Implementation and Stakeholder Engagement

- First Steps in Implementation
- Engaging Stakeholders
- Establishing Insights
- Planning for Next Steps
- Hands-on Workshop

Day 3: Leveraging AI Tools for Business Efficiency

- Introduction to AI Tools in Business
- Hands-on Workshop with ChatGPT
- Deep Dive into Generative AI integration into your business
- Developing an Implementation Plan
- Next Steps and Q&A

Data & AI Strategy
from Roadmap to Implementation

COURSEWARE

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Getting to know each other

3 Parts

 3

- **Introduction to Data & AI Strategy**
- Creating the Fundamentals
- Developing a Roadmap
- Hands-on Workshop

 4

Introduction to Data & AI Strategy

- ✓ Overview of Data and AI in the business context
- ✓ Key components of a Data and AI strategy
- ✓ Importance of aligning Data and AI strategy with business goals

“Good data is our number one goal!”

What is a Data & AI strategy?

Technology

Foundation

People

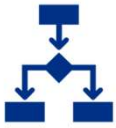
Process

Business Goals

What is a Data & AI strategy?

Business Goals

People



Process

Technology

Foundation

Business Goals

Understand your business goals.

Ask your stakeholders:

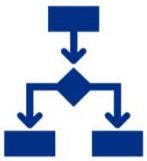
- ✓ Their top business goals that require data and AI use
- ✓ Biggest challenges
- ✓ Data privacy & security
- ✓ Time spent on data integration
- ✓ Data desires
- ✓ Success metrics

https://www.ibm.com/think/insights/data-differentiator/data-driven-organization

People

- ✓ Training:
  - Data literacy
  - Self-service BI
  - How to use AI
- ✓ Foster a data-driven culture:
  - Share successes
  - Set KPIs on data (quality) metrics
  - Assign data ownership
- ✓ Explain roles & responsibilities:
  - How will their job be impacted by data & AI usage?
  - Data governance
- ✓ New teams / roles?
  - Data engineers
  - Data analists
  - Data scientists

Process



- ✓ What are the key processes in the organization?
- ✓ Which processes can benefit most from data?
- ✓ How much effort will it take to make these processes data driven?
- ✓ Organize brainstorm sessions with the stakeholders / process owners

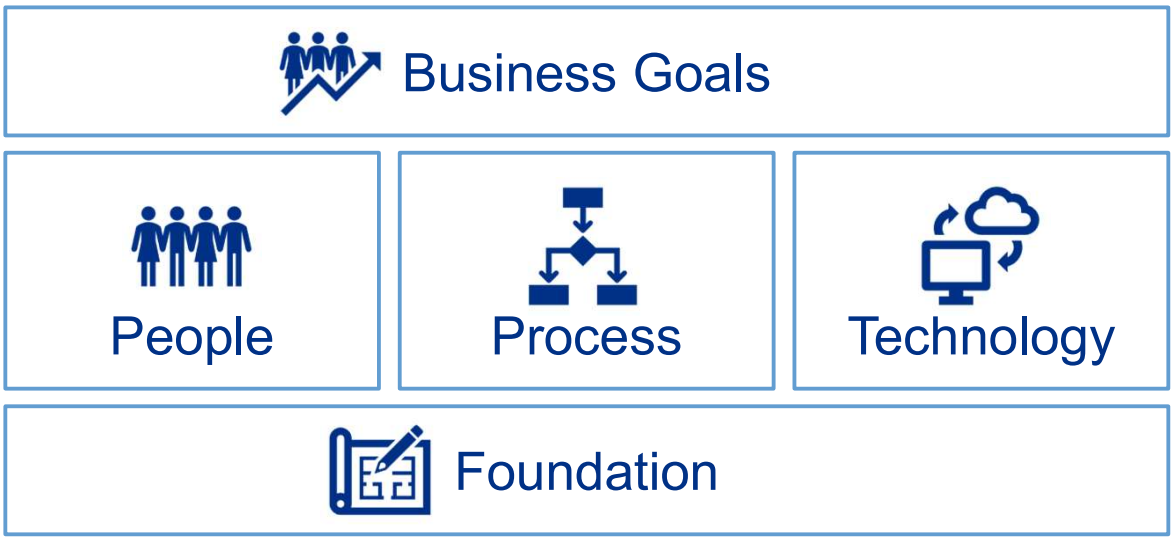
Technology

- ✓ "One" data platform
- ✓ But… different spaces on the platform
- ✓ Self-service:
  - Give freedom, get results
  - Analytical tooling
  - Scripting
- ✓ Automate (meta-)data quality checks:
  - Are golden standards followed?
  - Does the data make sense?

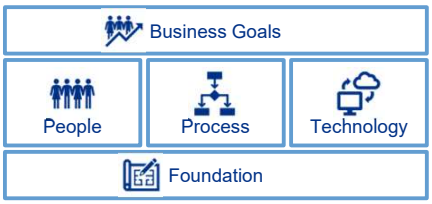
Foundation

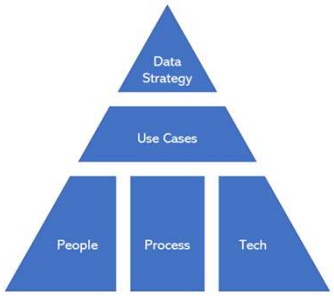
- ✓ Elements that impact all-of-the-above:
  - Timelines
  - Budgets
  - (Legal) constraints

What is a Data & AI strategy?



Many ways to draw this



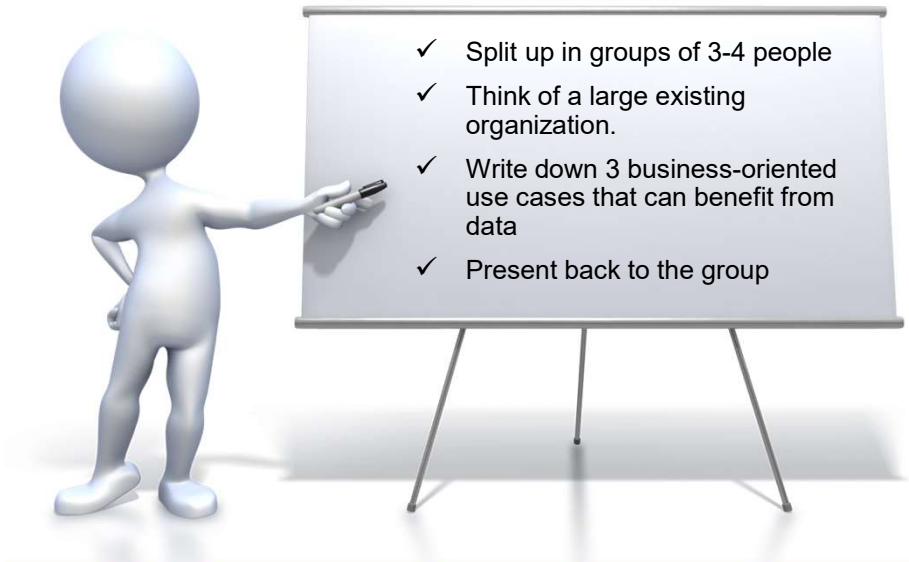


https://medium.com/@willemkoenders/my-simple-data-strategy-framework-c2cf90265d7a

https://towardsdatascience.com/wh-questions-of-data-strategy-1e6b0d19cb30

https://logic2020.com/insight/data-strategy-aligns-with-business-goals/

Time for an assignment



Foundation & Roadmap

- Introduction to Data & AI Strategy
- **Creating the Fundamentals**
- Developing a Roadmap
- Hands-on Workshop

“All our data needs to be interoperable!”

Key components of a good Data & AI Strategy

- ✓ Alignment with Business Objectives
- ✓ Analytics and Data Maturity Evaluation
- ✓ Data Architecture and Technology
- ✓ The Data Analytics Team
- ✓ Effective Data Governance
- ✓ Data Strategy Roadmap
- ✓ Culture Change and Adoption

https://www.analytics8.com/blog/7-elements-of-a-data-strategy/

Key components: Alignment with Business Objectives

- ✓ Identify relevant business drivers — big or small — that could be positively impacted by data and analytics.
- ✓ Understand departmental activities and how they sync up with business goals.
- ✓ Interview:
  - Start at the executive level
  - Also department leaders
- ✓ Uncover:
  - Their goals
  - Day-to-day business
  - Potential improvements
  - What is being measured
  - Information needs
- ✓ Compare your findings to industry standards: did you miss something?

Key components: Analytics and Data Maturity Evaluation

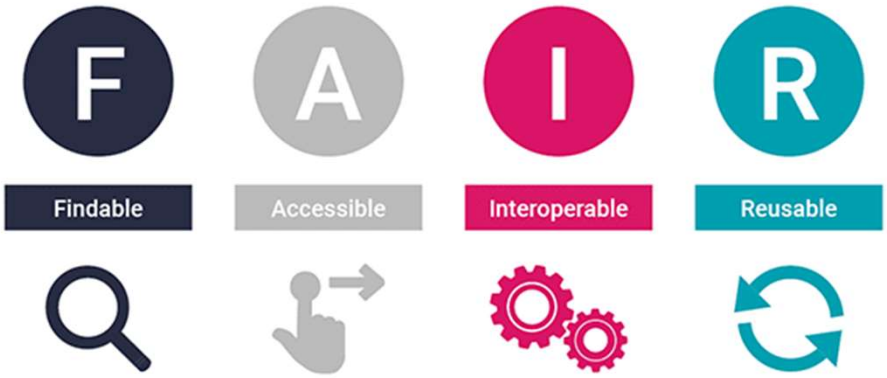
	Chaotic	Reactive	Defined	Managed	Optimized
	Teams are overwhelmed, lack confidence in reports and lack capacity for data-driven decision making.	Visibility on business' health is limited by reports that only offer a partial glimpse of past performance and lagging indicators.	Leaders have accurate data and defined key metrics shown within dashboards. They know what is happening today, and why.	Leaders have integrated enterprise analytics and cross- domain metrics that that provide some multi-faceted views and focus on future outcomes.	The organization is powered by enterprise analytics systems including predictive metrics, and data-driven decision making at all levels.
Analytics/ Reporting Structure	Nonexistent	Nonexistent	Basic/ Minimal	Integrated	Advanced
Analytics Management Processes	Siloed	Siloed	Siloed	Integrated	Governed
KPIs	Undefined and Ad-Hoc	Past Performance	Present/ Real-time	Measure Future Outcomes	Predictive and Comprehensive
Confidence in Data	Low	Partial	Partial	Full	Full
Employee Capabilities	Limited	Varied	Varied	Enabled	Enhanced

https://www.analytics8.com/blog/7-elements-of-a-data-strategy/

Data quality

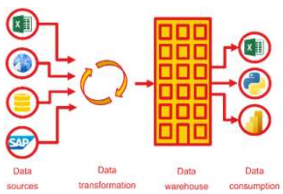
- ✓ Accuracy
- ✓ Completeness
- ✓ Consistency
- ✓ Integrity
- ✓ Reasonableness
- ✓ Timeliness
- ✓ Uniqueness

Data usefulness

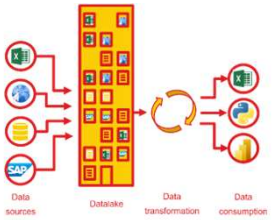


Key components: Data Architecture and Technology

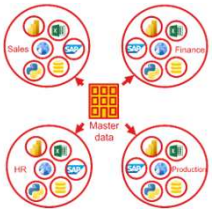
- ✓ Data architecture choices are tightly coupled with operations. Three design paradigms:
  - Structure before storing: use a data warehouse (ETL)
  - Store first, structure later: use a datalake (ELT)
  - No central data duplication: use data mesh or data virtualization



Extract-transform-load (ETL)



Extract-load-transform (ELT)



Data mesh

Key components: The Data Analytics Team

- ✓ Team of mathematicians and computer scientists
- ✓ Complementary to the experts in the business lines
- ✓ Work in multi-disciplinary teams **with** domain experts on a project-basis
- ✓ Identifies business opportunities based on **available technology** in **collaboration** with domain experts

Key components: Effective Data Governance

What is data governance?

- ✓ Framework for managing data assets effectively
- ✓ Ensures data accuracy, consistency, and security
- ✓ Aligns data management with business objectives
- ✓ Key to compliance with regulations and standards

Key components: Effective Data Governance

Why is data governance important?

- ✓ Provides trust in data for decision-making
- ✓ Mitigates risks related to data misuse
- ✓ Supports regulatory compliance (e.g., GDPR)
- ✓ Enhances operational efficiency through better data

Key components: Effective Data Governance

https://www.pythian.com/blog/business-insights/identifying-and-engaging-data-stewards

Key components: Effective Data Governance

Steps to implement data governance:

1. Define goals aligned with business needs
2. Identify and assign key roles and responsibilities
3. Establish data policies and standards
4. Implement tools for data management and monitoring
5. Continuously review and improve governance practices

Key components: Data Strategy Roadmap

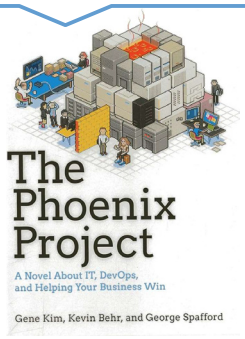
- ✓ Clearly define the current state
- ✓ Define which business goals are to be optimized, within a reasonable amount of time
- ✓ Identify dependencies, then plan the business goals on a timeline
- ✓ Understand that the involvement of certain roles changes over time:

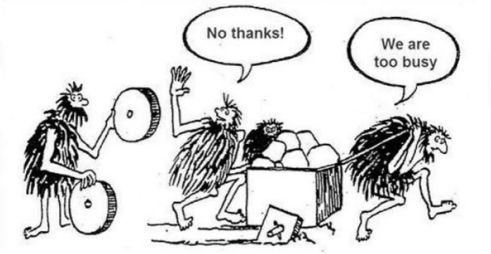
Role	Proof-of-concept	MVP	Production
Data scientist	⭐⭐⭐	⭐⭐	⭐
Data engineer	⭐	⭐⭐	⭐⭐⭐
Domain expert	⭐⭐⭐	⭐⭐	⭐⭐⭐

more later…

Key components: Culture Change and Adoption

"Improving daily work is even more important than doing daily work."





Key components

- ✓ Alignment with Business Objectives
- ✓ Analytics and Data Maturity Evaluation
- ✓ Data Architecture and Technology
- ✓ The Data Analytics Team
- ✓ Effective Data Governance
- ✓ Data Strategy Roadmap
- ✓ Culture Change and Adoption

- Introduction to Data & AI Strategy
- Creating the Fundamentals
- **Developing a Roadmap**
- Hands-on Workshop

Developing a Roadmap

https://www.auxiliobits.com/how-to-drive-value-for-your-business-with-an-ai-strategy-roadmap/

Vision

- ✓ Alignment with Business Objectives
- ✓ Long-Term Perspective
- ✓ Cross-Functional Collaboration
- ✓ Ethical and Responsible AI

Value-realization

Remember: a KPI is **not** a goal

- ✓ Define Measurable Goals
- ✓ Establish Key Performance Indicators (KPIs)
- ✓ Data-Driven Decision Making
- ✓ Iterative Improvement
- ✓ Start with low-hanging fruit

Risk Management

- ✓ Ethical Frameworks and Guidelines
- ✓ Regulatory Compliance
- ✓ Bias Detection and Mitigation
- ✓ Cybersecurity and Data Protection

Adoption Plans

- ✓ Change Management
- ✓ Skill Development and Talent Acquisition
- ✓ Cross-Functional Collaboration
- ✓ Scalability and Sustainability
- ✓ User Experience Design
- ✓ Measurement and Feedback

Remember: a data scientist is not a change manager!

- Introduction to Data & AI Strategy
- Creating the Fundamentals
- Developing a Roadmap
- **Hands-on Workshop**

Assignment: build your own roadmap

4 x 5 minutes

- Introduction to Data & AI Strategy
- Creating the Fundamentals
- Developing a Roadmap
- Hands-on Workshop

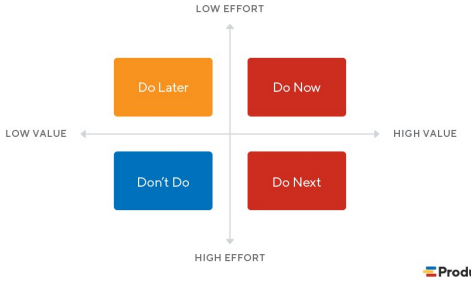
3 Parts

Implementation & Stakeholder Engagement

- **First Steps in Implementation**
- Engaging Stakeholders
- Establishing Insights
- Planning for Next Steps
- Hands-on Workshop

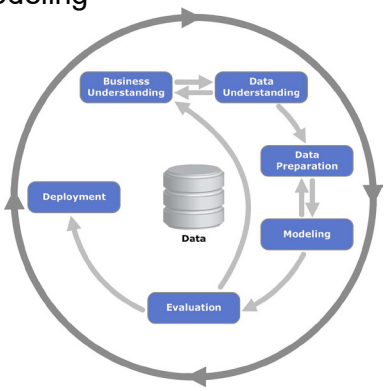
First steps in implementation: prioritize

- ✓ Set up brainstorm sessions inside the departments:
  - Which processes need improvement?
  - How much effort is needed to improve these processes?
  - Use the output from the interview sessions within that department as a starting point
- ✓ Use t-shirt sizes or a similar approach to estimate effort and value



First steps in implementation: setting up the first BI / AI projects

- ✓ For the most promising cases, use a framework like CRISP-DM
- ✓ For BI projects, read “build the dashboard” instead of “modeling”

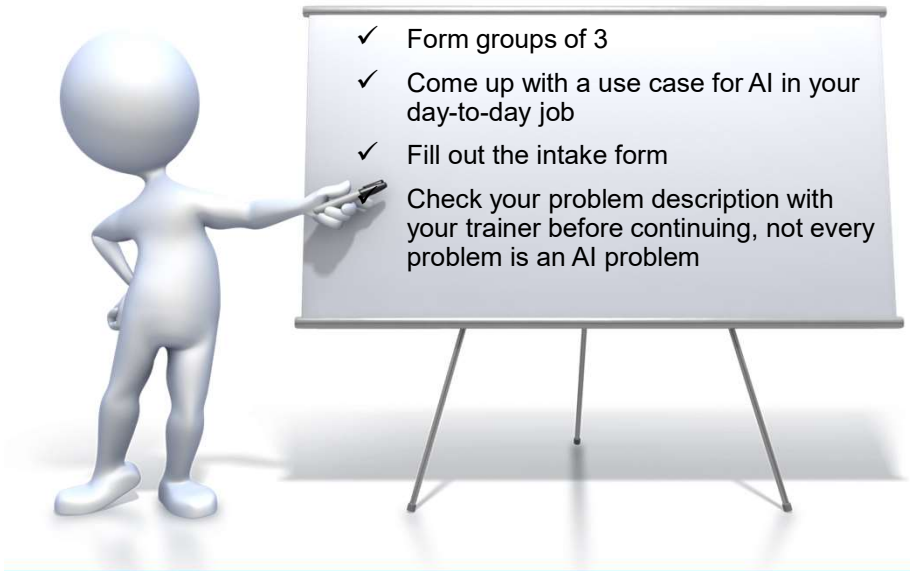


Business understanding

Make sure you understand what the problem is:

- ✓ General problem description
- ✓ Vocabulary
- ✓ Stakeholders and their representatives
- ✓ Potential impact
- ✓ Definition of Done
- ✓ Key datasets

Assignment: design a project plan for one AI use case



- Problem description
- Vocabulary
- Stakeholders
- Potential impact
- Definition of Done
- Key datasets

Data understanding: assess data quality

✓ For the most promising cases, assess the data quality:
- Accuracy
- Completeness
- Consistency
- Integrity
- Reasonableness
- Timeliness
- Uniqueness

✓ Thomas Redman (aka “The Data Doc”):
Print out 100 lines of data from each table

Data preparation

- ✓ Combine data from multiple sources
- ✓ Visualize the data to understand if it makes sense
- ✓ Cross-check data over multiple sources: do they add up to the same numbers as in existing reports?
- ✓ Make sure data aggregates to the same level (time intervals, regions, etc)

First steps in implementation: visualize data

Visualizing data is an easy way to:

- ✓ Assess data quality in further depth
- ✓ Understand the relation between different columns and tables

Build the dashboard / model

- ✓ In this step AI and BI deviate the most from each other:
  - AI: build the model
  - BI: build the dashboard
- ✓ Let BI consultants build the dashboard, or data scientists do the modelling
- ✓ Make sure there are constant check-ins between the BI consultants / data scientists and the domain experts. This:
  - Avoids double work
  - Ensures the results actually bring the business goals closer
- ✓ Note: on a self-service platform, the domain expert and BI consultant may be the same person. This approach is not suitable for every organization.

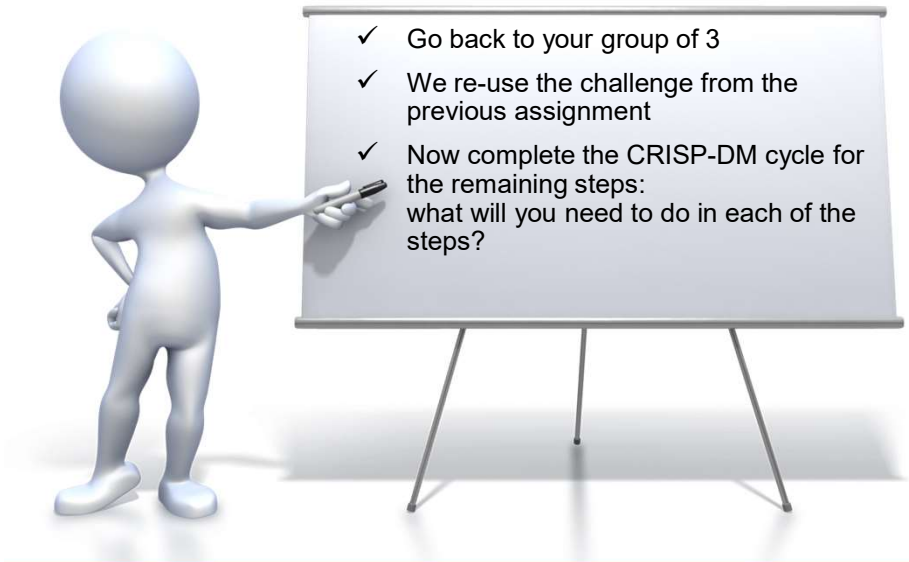
Evaluation

- ✓ Evaluate the model / report. If this goes live, will the business actually benefit?
  - What can be gained from the model / dashboard?
  - What is the price-to-pay if the model is wrong? (e.g. *false positives/negatives)*

Deployment

- ✓ Deploy the dashboard / model
- ✓ When successful: scale up from PoC to MVP to productionized model/dashboard
- ✓ Ensure a team will maintain the model/dashboard. Either the team that built it or a specific team that monitors all models.
- ✓ Advantage of team that built it: knowing you will be the one maintaining the code, automatically improves the way-of-working

Assignment: design a project plan for one AI use case



- ✓ Go back to your group of 3
- ✓ We re-use the challenge from the previous assignment
- ✓ Now complete the CRISP-DM cycle for the remaining steps:
what will you need to do in each of the steps?