DATENGESTÜTZTE ENTSCHEIDUNGSFINDUNG IN DEN WIRTSCHAFTSWISSENSCHAFTEN

DESIGN THINKING - ODER DOCH NICHT?

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HOCHSCHULE BOCHUM

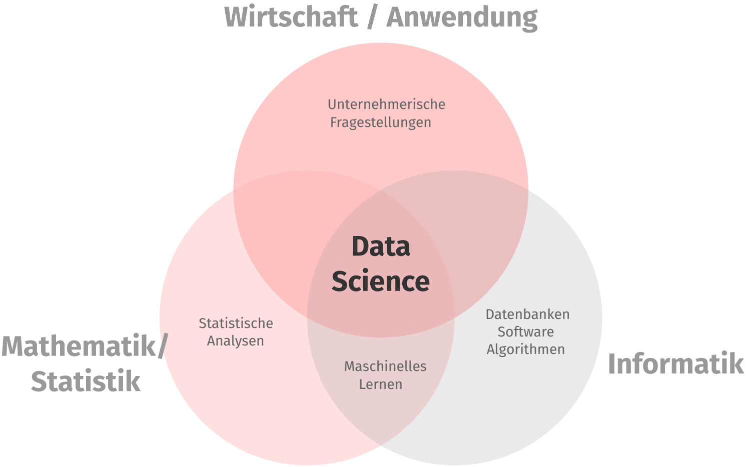
Von der Idee zur Analyse

WORUM GEHT ES?

Worum geht es im Kurs?

- Etablieren von datengetriebener Denk-/Arbeitsweise
- Kennenlernen von Methoden (Statistik, ML)
- Wissenschaftliche Arbeitsweise
- Vorbereitung auf BA, Beruf

WORUM GEHT ES?



Wirtschaft / Anwendung

Unternehmerische
Fragestellungen

Data Science

Mathematik/ Statistik

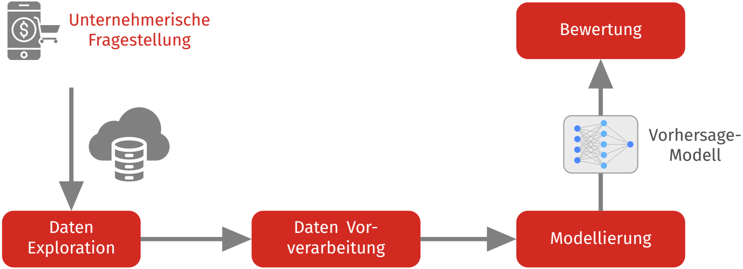
Statistische
Analysen

Maschinelles
Lernen

Datenbanken
Software
Algorithmen

Informatik

Vorgehen bei der Datenanalyse



Unternehmerische Fragestellung

Daten Exploration

Daten Vorverarbeitung

Modellierung

Vorhersage-Modell

Bewertung

WORUM GEHT ES?

Data Science / Quantitative Methoden / Statistik

Beispiel für wirtschaftlichen Kontext, Anwendungsfall gegeben; vorgegebene Aufgaben:

1. Datenvorverarbeitung
2. Statistiken / Exploration
3. Modellierung / Evaluation

Worum geht es jetzt?

Sie haben einen Datensatz.

WORUM GEHT ES JETZT?

Sie haben einen Datensatz.

Und nun?

- Verstehen: Sammeln Sie Informationen über den Kontext (Fachwissen)
- Schauen Sie sich die Daten an
- Beschreiben, Fragestellung finden, Analysieren

WORUM GEHT ES JETZT?

Sie haben einen Datensatz.

Und nun?

- Verstehen: Sammeln Sie Informationen über den Kontext (Fachwissen)
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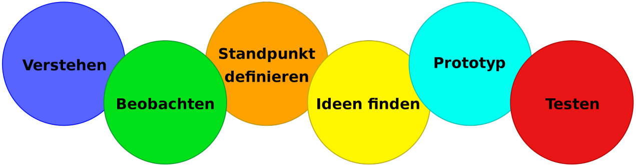
Was ist der Mehrwert für ihre Audience?

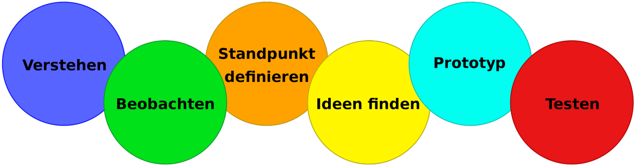
Design Thinking

Design Thinking


Verstehen
Beobachten
Standpunkt definieren
Ideen finden
Prototyp
Testen

- Design Thinking – Innovationsprozess
- Nach Terry Winograd, Larry Leifer, David Kelley (alle Stanford)

Design Thinking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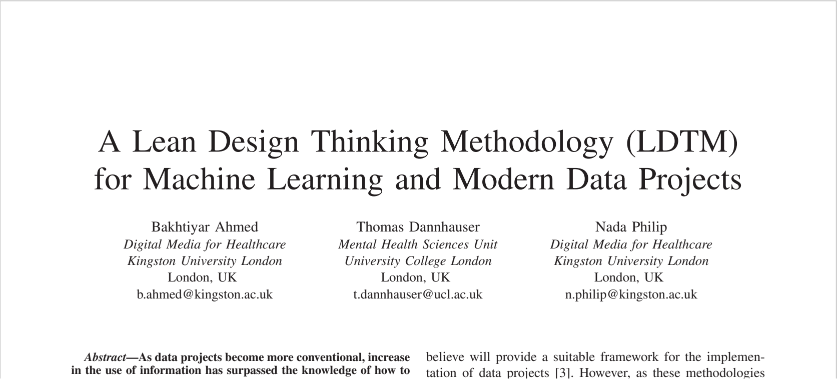
Was hilft den Benutzern/Kunden? Mehrwert?

Design Thinking – Phasen

1. Frame a question
   Finden Sie eine treibende Frage, die andere inspiriert nach kreativen Lösungen zu suchen
2. Gather Inspiration
   Inspirieren Sie zum Denken von Neuem, indem Sie herausfinden, was Menschen wirklich brauchen
3. Generate Ideas
   Lassen sie offensichtliche Lösungen hinter sich, um zu bahnbrechenden Ideen zu gelangen
4. Make Ideas Tangable
   Erstellen Sie grobe Prototypen um zu begreifen, wie Sie Ideen verbessern können
5. Test to Learn
   Verfeinern Sie Ideen, indem Sie Feedback sammeln und vorwärts experimentieren
6. Share the Story
   Erstellen Sie eine menschliche Geschichte, um andere zum Handeln anzuregnen.

Design Thinking, Lean Startup, CRISP-DM



A Lean Design Thinking Methodology (LDTM) for Machine Learning and Modern Data Projects

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***Abstract*—As data projects become more conventional, increase in the use of information has surpassed the knowledge of how to**

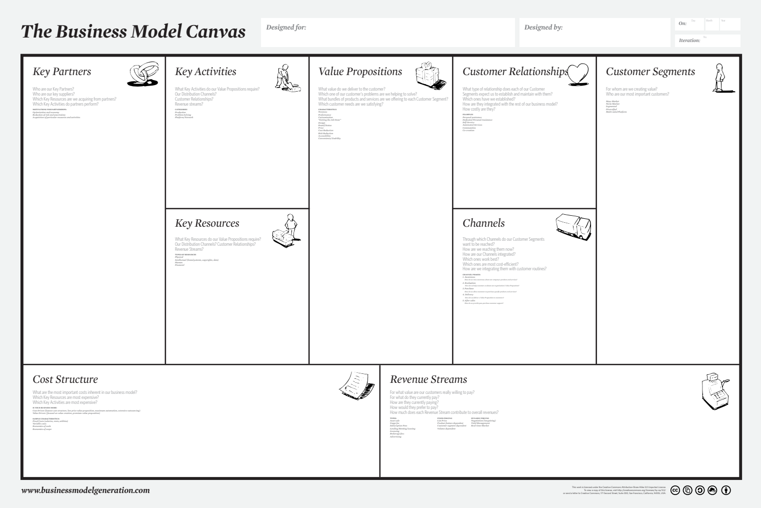
believe will provide a suitable framework for the implementation of data projects [3]. However, as these methodologies

DATA SCIENCE CANVAS

Canvas Strategien

- Stukturierung des Vorgehens
- Guideline für Fragestellungen

Business Model Canvas



The Business Model Canvas

Designed for:

Designed by:

On:

Iteration:

Key Partners

Who are our Key Partners?
Who are our key suppliers?
Which Key Resources are we acquiring from partners?
Which Key Activities do partners perform?

MOTIVATIONS FOR PARTNERSHIPS:
Optimization and economy
Reduction of risk and uncertainty
Acquisition of particular resources and activities

Key Activities

What Key Activities do our Value Propositions require?
Our Distribution Channels?
Customer Relationships?
Revenue streams?

CATEGORIES
Production
Problem Solving
Platform/Network

Key Resources

What Key Resources do our Value Propositions require?
Our Distribution Channels? Customer Relationships?
Revenue Streams?

TYPES OF RESOURCES
Physical
Intellectual (brand patents, copyrights, data)
Human
Financial

Value Propositions

What value do we deliver to the customer?
Which one of our customer's problems are we helping to solve?
What bundles of products and services are we offering to each Customer Segment?
Which customer needs are we satisfying?

CHARACTERISTICS
Newness
Performance
Customization
"Getting the Job Done"
Design
Brand/Status
Price
Cost Reduction
Risk Reduction
Accessibility
Convenience/Usability

Customer Relationships

What type of relationship does each of our Customer Segments expect us to establish and maintain with them?
Which ones have we established?
How are they integrated with the rest of our business model?
How costly are they?

EXAMPLES
Personal assistance
Dedicated Personal Assistance
Self-Service
Automated Services
Communities
Co-creation

Channels

Through which Channels do our Customer Segments want to be reached?
How are we reaching them now?
How are our Channels integrated?
Which ones work best?
Which ones are most cost-efficient?
How are we integrating them with customer routines?

CHANNEL PHASES
1. Awareness
2. Evaluation
3. Purchase
4. Delivery
5. After sales

Customer Segments

For whom are we creating value?
Who are our most important customers?

Mass Market
Niche Market
Segmented
Diversified
Multi-sided Platform

Cost Structure

What are the most important costs inherent in our business model?
Which Key Resources are most expensive?
Which Key Activities are most expensive?

IS YOUR BUSINESS MORE:
Cost Driven (leanest cost structure, low price value proposition, maximum automation, extensive outsourcing)
Value Driven (focused on value creation, premium value proposition)

SAMPLE CHARACTERISTICS:
Fixed Costs (salaries, rents, utilities)
Variable costs
Economies of scale
Economies of scope

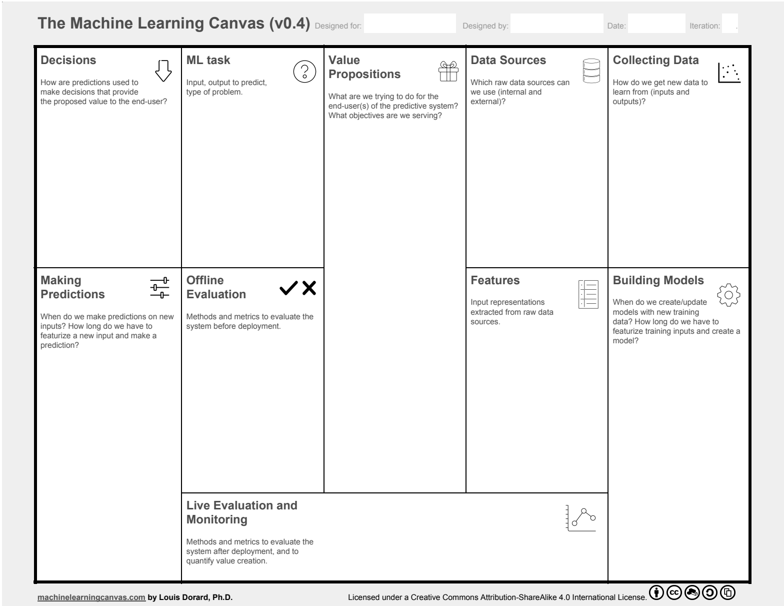
Revenue Streams

For what value are our customers really willing to pay?
For what do they currently pay?
How are they currently paying?
How would they prefer to pay?
How much does each Revenue Stream contribute to overall revenues?

TYPES:	FIXED PRICING	DYNAMIC PRICING
Asset sale	*List Price*	*Negotiation (bargaining)*
Usage fee	*Product feature dependent*	*Yield Management*
Subscription Fees	*Customer segment dependent*	*Real-time-Market*
Lending/Renting/Leasing	*Volume dependent*	
Licensing		
Brokerage fees		
Advertising		

www.businessmodelgeneration.com

DATA SCIENCE CANVAS



The Machine Learning Canvas (v0.4)

Designed for: Designed by: Date: Iteration:

Decisions

How are predictions used to make decisions that provide the proposed value to the end-user?

ML task

Input, output to predict, type of problem.

Value Propositions

What are we trying to do for the end-user(s) of the predictive system? What objectives are we serving?

Data Sources

Which raw data sources can we use (internal and external)?

Collecting Data

How do we get new data to learn from (inputs and outputs)?

Making Predictions

When do we make predictions on new inputs? How long do we have to featurize a new input and make a prediction?

Offline Evaluation

Methods and metrics to evaluate the system before deployment.

Features

Input representations extracted from raw data sources.

Building Models

When do we create/update models with new training data? How long do we have to featurize training inputs and create a model?

Live Evaluation and Monitoring

Methods and metrics to evaluate the system after deployment, and to quantify value creation.

machinelearningcanvas.com **by Louis Dorard, Ph.D.**

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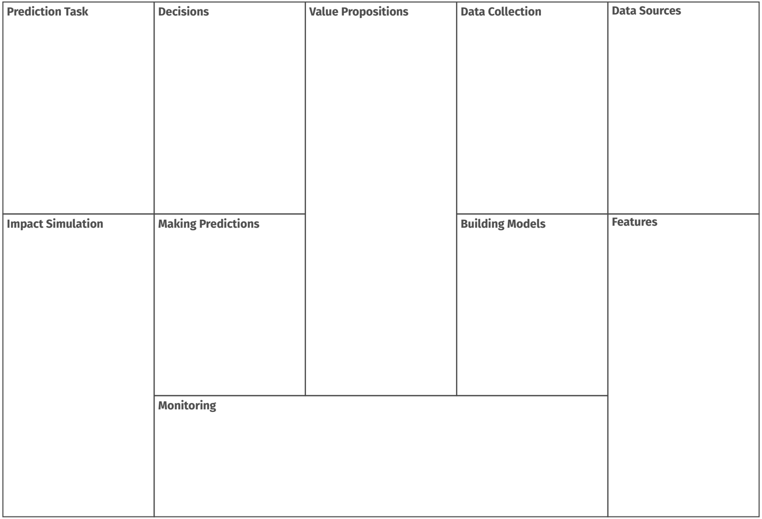
DATA SCIENCE CANVAS



Prediction Task

Decisions

Value Propositions

Data Collection

Data Sources

Impact Simulation

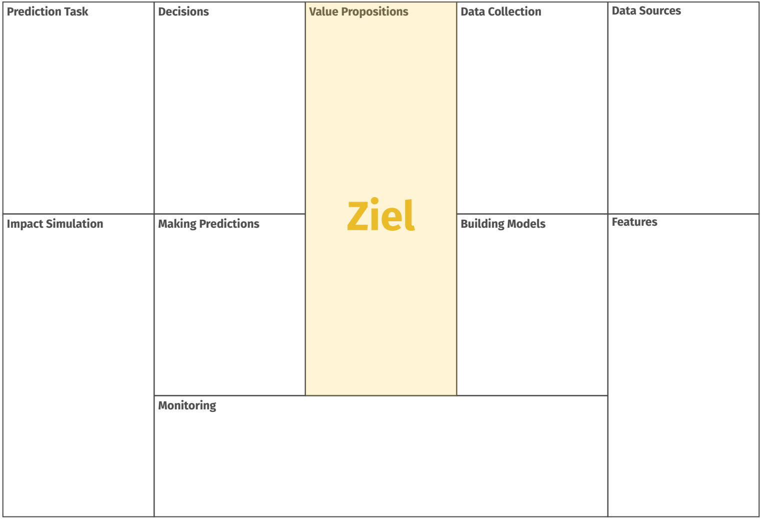
Making Predictions

Building Models

Features

Monitoring

DATA SCIENCE CANVAS



Prediction Task

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Ziel

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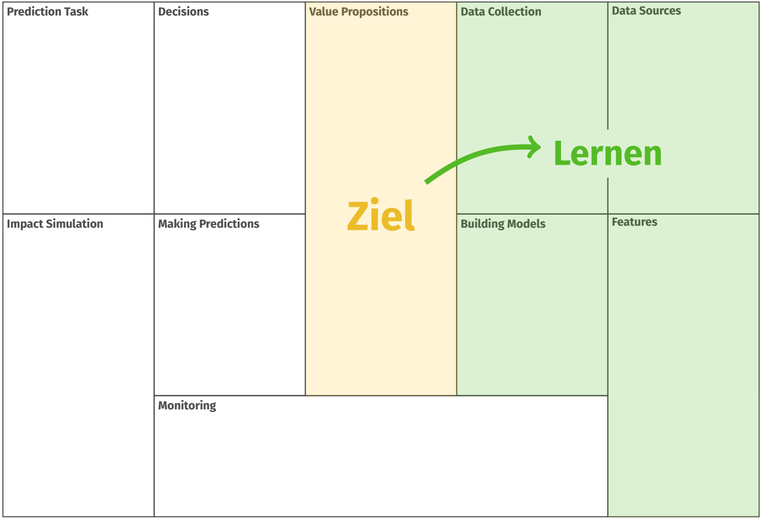

Prediction Task

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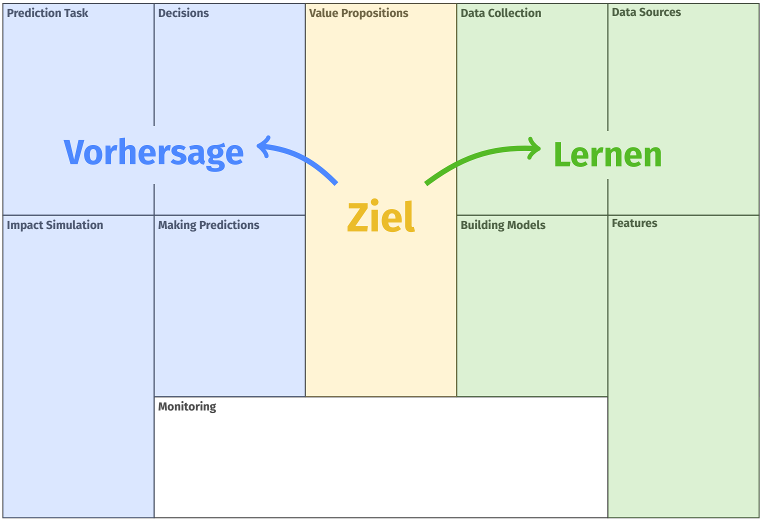
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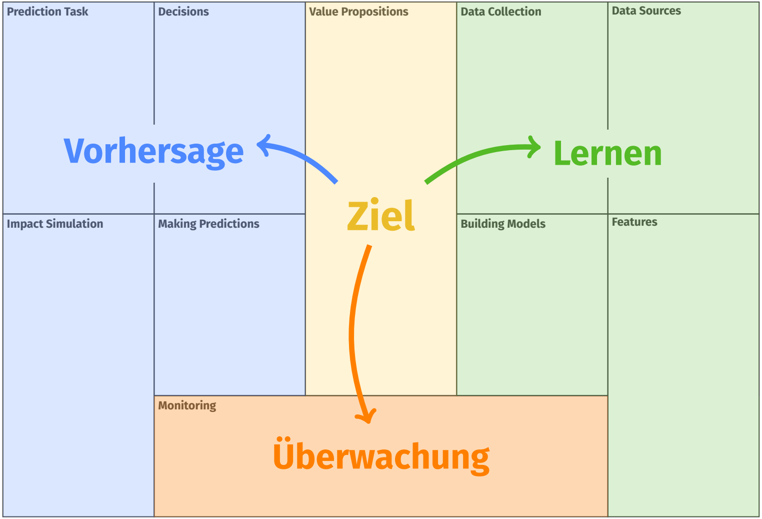
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Überwachung

DATA SCIENCE CANVAS

Ziele

- Welche Ziele verfolgen wir mit der Analyse?
- Welchen Nutzen haben die Konsumenten der Analyse?

DS Canvas eoda GmbH

<table>
<tr><td>Zu lösende Aufgabe</td><td>Skizze der Lösungsidee</td><td>Potentielle Kunden</td><td rowspan="2">Datenlage</td></tr>
<tr><td>Wie sieht bisherige Lösung aus?</td><td>Kennzahlen für Erfolg bzw. Misserfolg?</td><td>Potentielle Early Adopters?</td></tr>
<tr><td colspan="2">Potentielle Kosten?</td><td colspan="2">Potentieller Nutzen?</td></tr>
</table>

[https://www.eoda.de/wissen/blog/data-science-canvas/]

Beispiel

DATENSATZ

Tankerkönig

- Preis-Daten der Markttransparenzstelle für Kraftstoffe
- Benzinpreise von über 14.000 Tankstellen in Deutschland
- Grundlage für Apps und andere Dienste

DATENSATZ

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- Preis-Daten der Markttransparenzstelle für Kraftstoffe
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https://hsbo.de/tankpreise

GRUPPENARBEIT

Design Thinking - Gemeinsam Ideen entwickeln!

- Was lässt sich mit den Tankdaten realisieren?
- Was wird gebraucht?
- Welche Schritte sind notwendig?
- Wie kommen wir zu einem MVP?
- Wann sind wir mit unserer Idee erfolgreich?