



BSH Home Appliances Group

B/S/H/

Data Analytics bei der BSH

2020-11-12

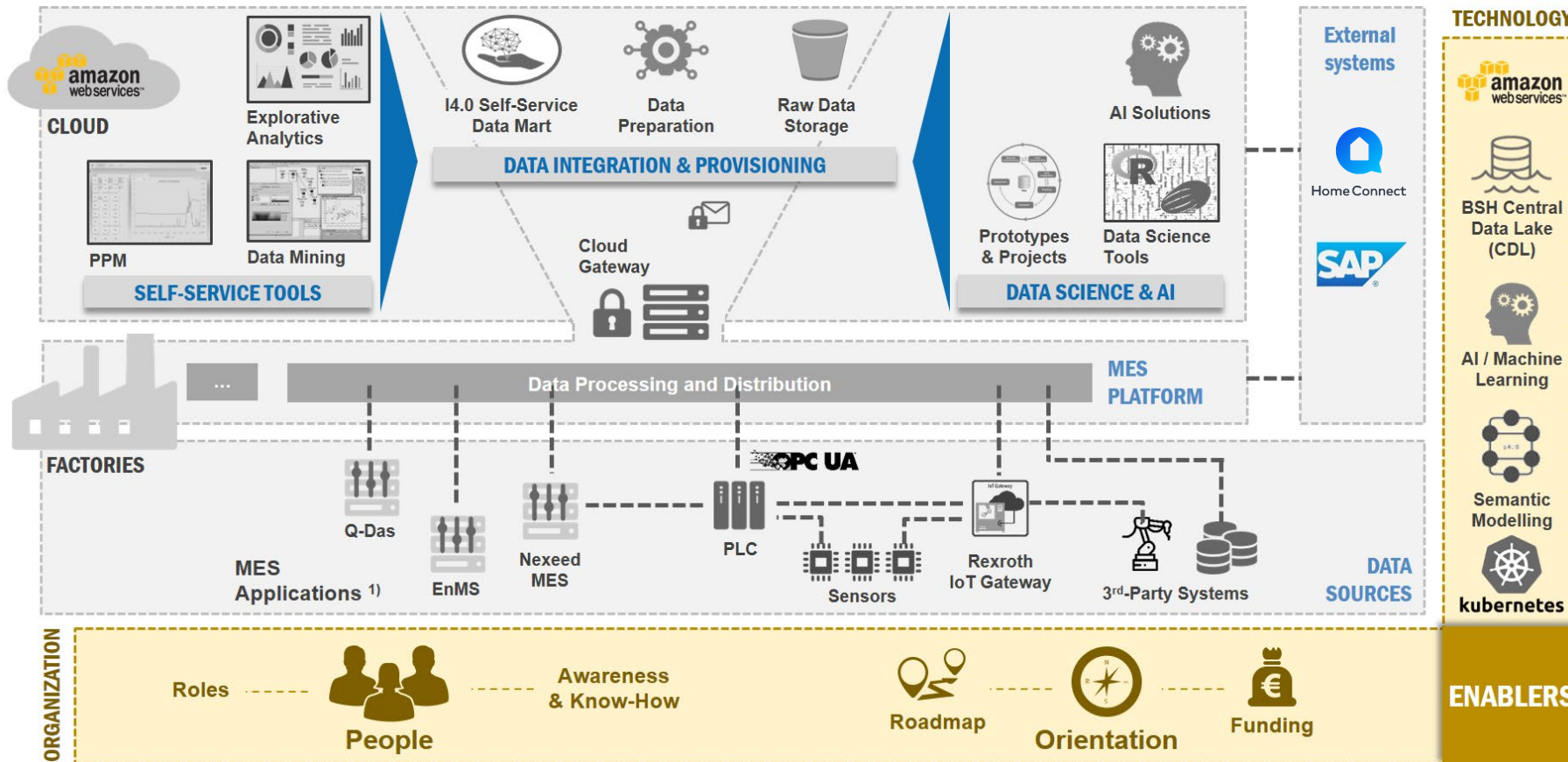
Felix Wolters, Volkan Tuluk, Otto Krautenbacher

Menti (Word-cloud): Nennen Sie 5 Themen, die für Ihr Unternehmen am relevantesten sind im Kontext von I4.0



Menti (Ranking): Was sind Ihre größten Herausforderungen im Bezug auf Data Analytics in der Fertigung

Unser Big Picture für Data Analytics (Fokus Fertigung)



Zwei Anwendungsbeispiele für Data Analytics in der BSH

Analytics in der Produktion



Analytics nach dem Verkauf der Ware



A Holistic Analytics Platform | 3 Pillars

Enterprise Reporting

#Standardized Reporting
#KPIs



Explorative Analytics

#Self-Service Analytics
#Granular Data



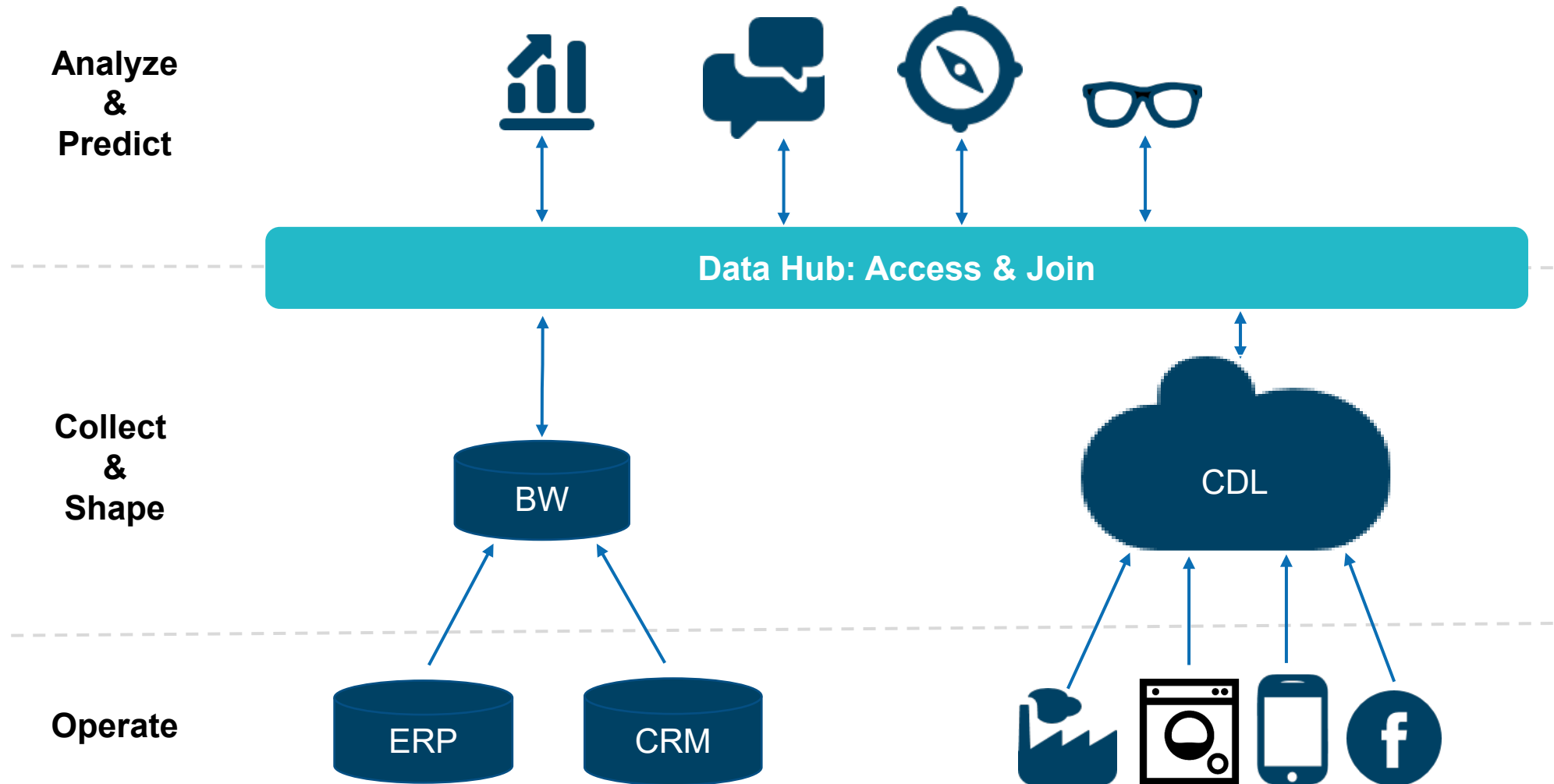
Data Science/ Artificial Intelligence

Prediction & automation
#Raw Data



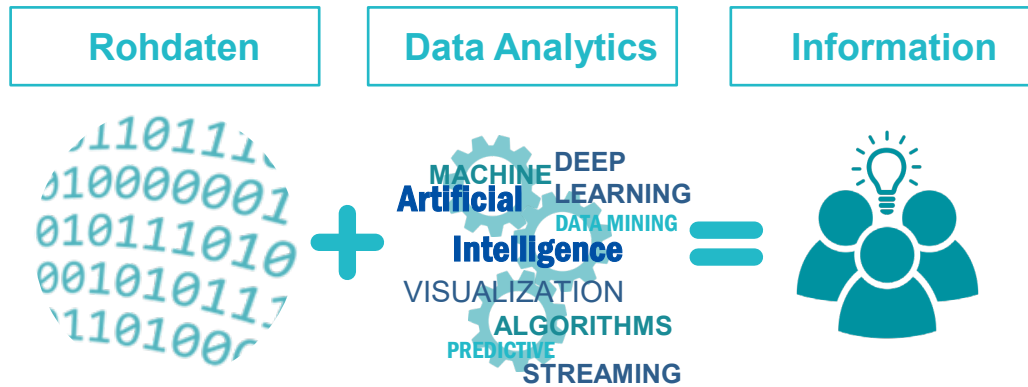
Data landscape as foundation

Analytics in Action | Components

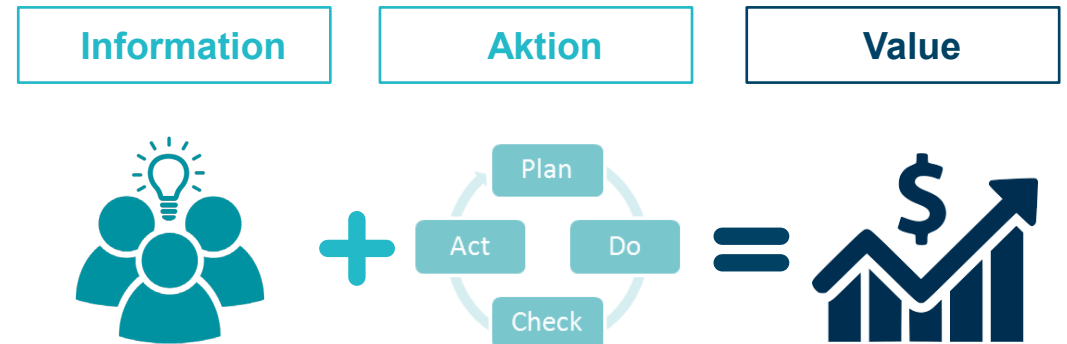


i4.0 Data Analytics | From raw data to operational value

From raw data to information



From information to value



Strong collaboration between Business, IT & Data Scientists needed

i4.0 Data Analytics | Motivation

Improve Product Quality

With data-driven root cause analysis, internal and external quality incidents could be solved quicker and more sustainable.

Improve Maintenance

Based on machine monitoring data driven Predictive Maintenance could be achieved

Improve Processes

With data science methods like machine learning production processes could be continuously improved



Improve Supply Chain

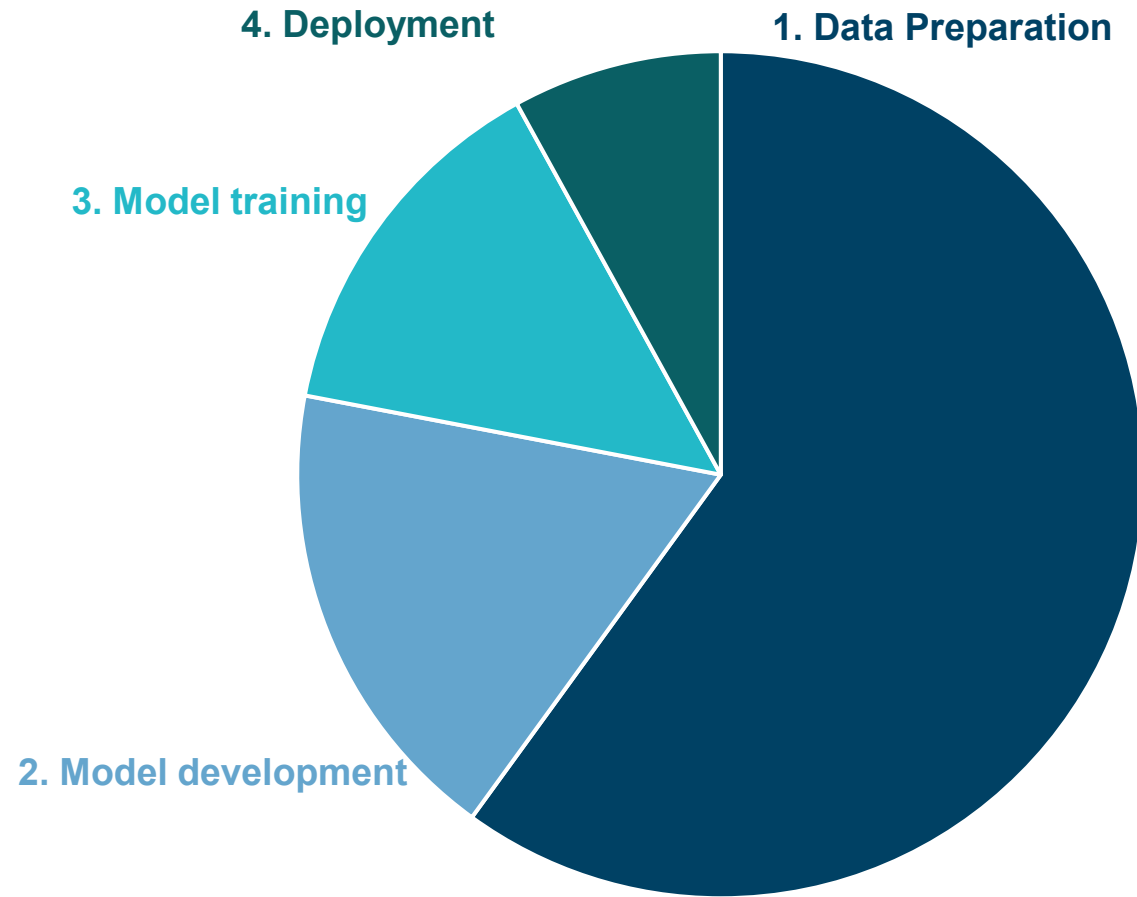
With data science methods like machine learning supply chain and Logistics processes can be improved



Improve Energy Management

With data science methods like machine learning our energy consumption could be reduced

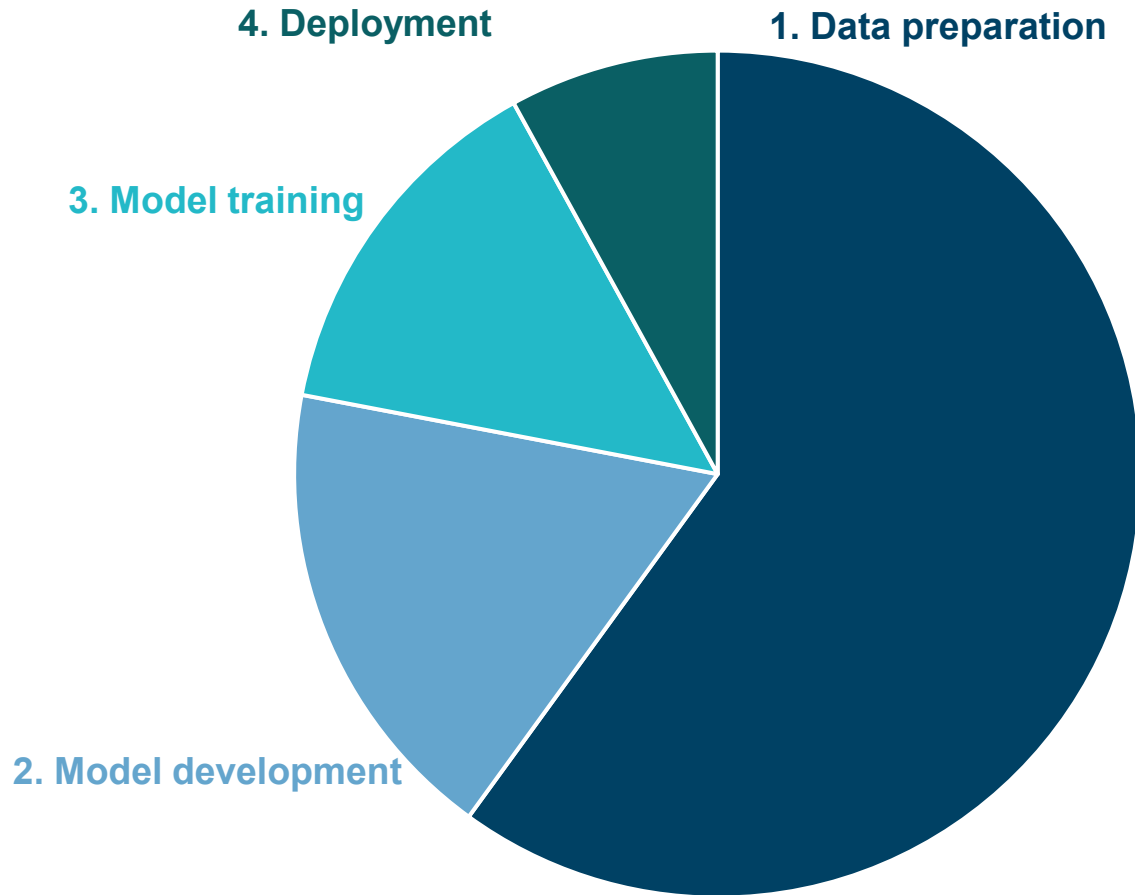
Data Science | Phases & Duration



Wie viel Prozent der gesamten Zeit dauert Datenaufbereitung bei einem I4.0 Projekt?

- a. Weniger als 50%
- b. 51% - 60%
- c. 61% - 70%
- d. Mehr als 80%

Data Science | Phases & Duration



FRAGE

Wie viel Prozent der gesamten Zeit dauert Datenaufbereitung bei einem I4.0 Projekt?

- a. Weniger als 50%
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Data quality matters!

Challenges | What is stopping us?

Organizational challenges

- Awareness and change management
- Providing trainings
- Introduction of new roles & responsibilities
- Data democratization

Technical challenges

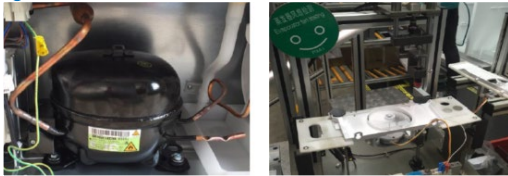
- Standardization of connectivity
- Data blending
- Standardization of data models
- Information security and data privacy



Use Case | Vibration Analysis in PRF

Use case from RGC

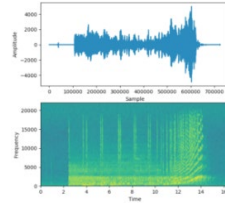
Vibration Analysis of
fridge compressors



May'19

Data model is ready

Machine learning
with Neural Networks
on Sonogram
images. Pending for
MES for E2E
deployment.



Jun'19



Nov'19



Jan'20

CKY gets new sensors

Data collection
begins, but several
months are
needed for
sufficient data



May'20



Nov'20

Data collection in Chuzhou

Classification of
Spectrograms for
Machine Learning
based on Sonogram
pictures

CKY is interested too

No problems with
MES, but there is
no data

Current status: No E2E Deployment

CKY keeps collecting
data, while Chuzhou
still waits for MES
integration

Key messages

1. Standardize and rollout cloud connectivity!
2. Take utmost care of your data!
3. Empower and equip data analysts!



Zwei Anwendungsbeispiele für Data Analytics in der BSH

Analytics in der Produktion

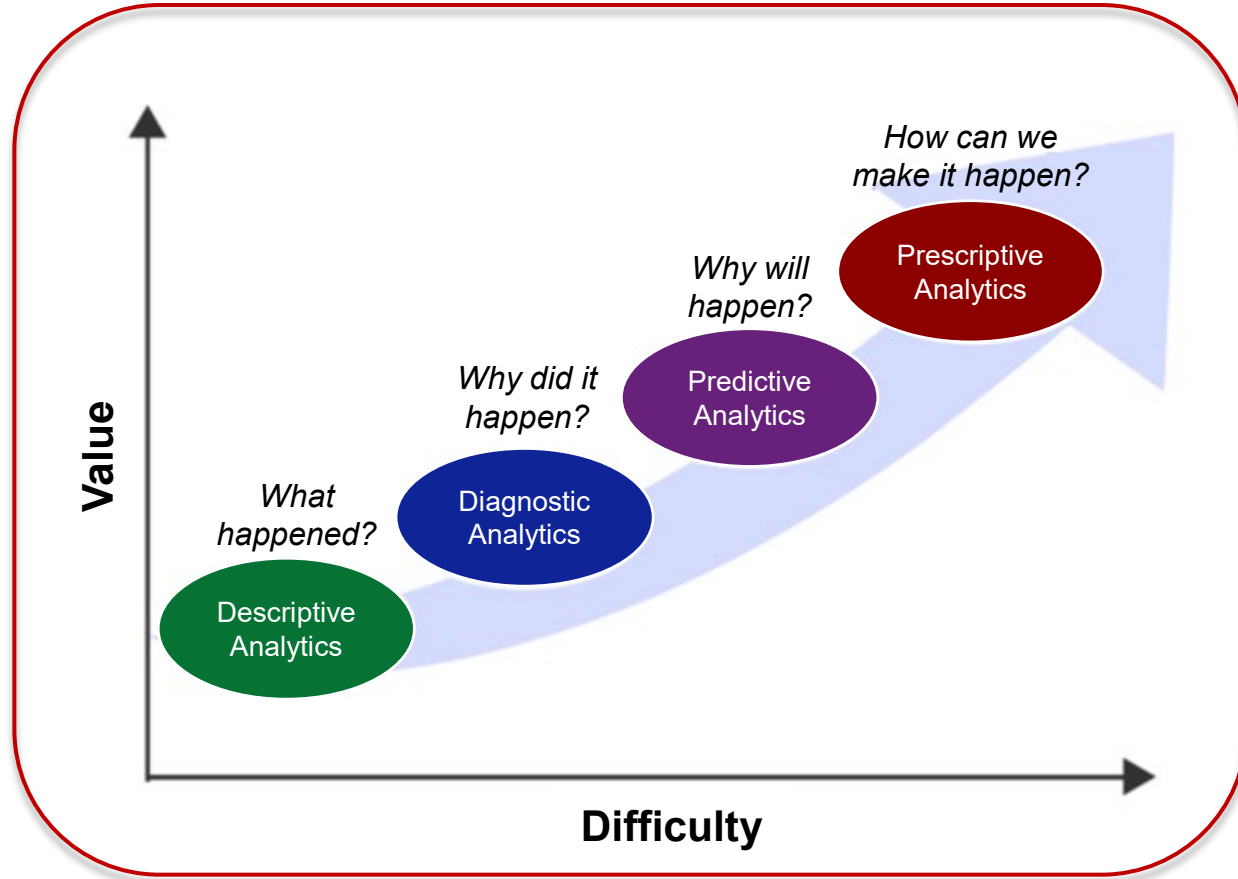


Analytics nach dem Verkauf der Ware



Data Analytics “After sales”

Understanding the consumer behaviour



What is the data telling you?

Descriptive What's happening in my business?

- Comprehensive, accurate and live data
- Effective visualization

Diagnostic Why is it happening?

- Ability to drill down to the root-cause
- Ability to isolate all confounding information

Predictive What's likely to happen?

- Business strategic have remained fairly consistent over time
- Historical patterns being used to predict specific outcomes using algorithms
- Decisions are automated using algorithms and technology

Prescriptive What do I need to do?

- Recommended actions and strategies based on champion/challenger testing strategy outcomes
- Applying advanced analytical techniques to make specific recommendations

Source: https://www.governanceanalytics.org/knowledge-base/Main_Tools/Data_classification_and_analysis

... while helping us to continuously improve product development and user experience based on machine usage data

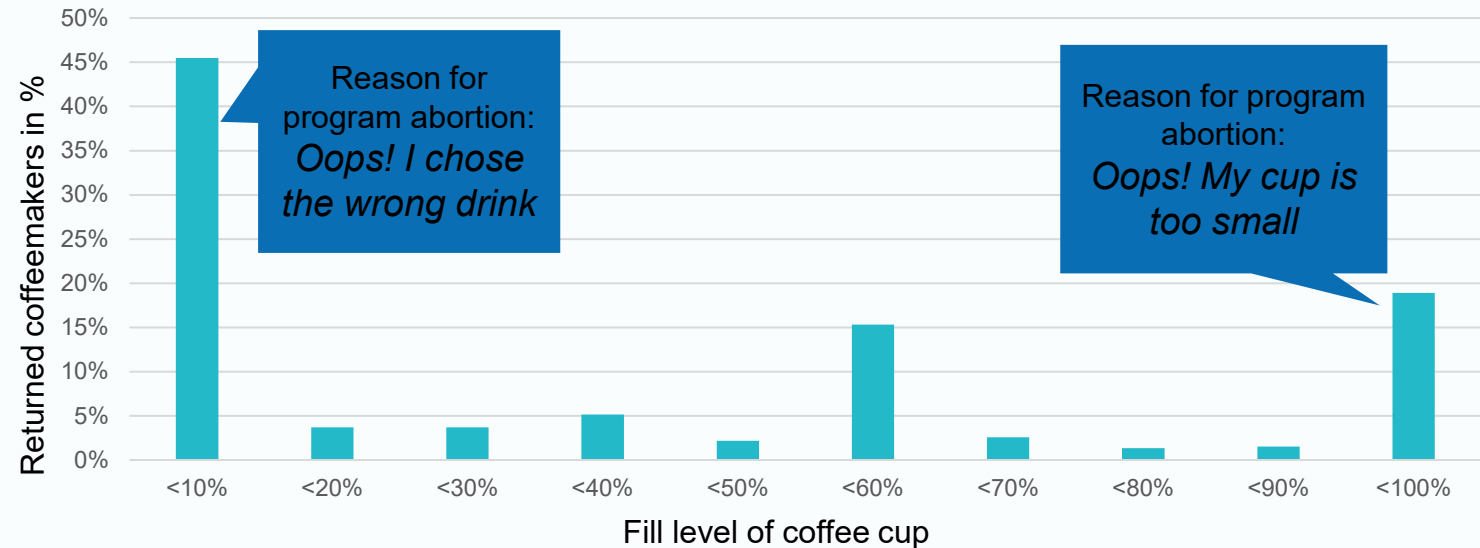


Home Connect

Problem

Unexpected high error rate and return quota of coffeemakers' brewing unit.

Problem analysis via Home Connect



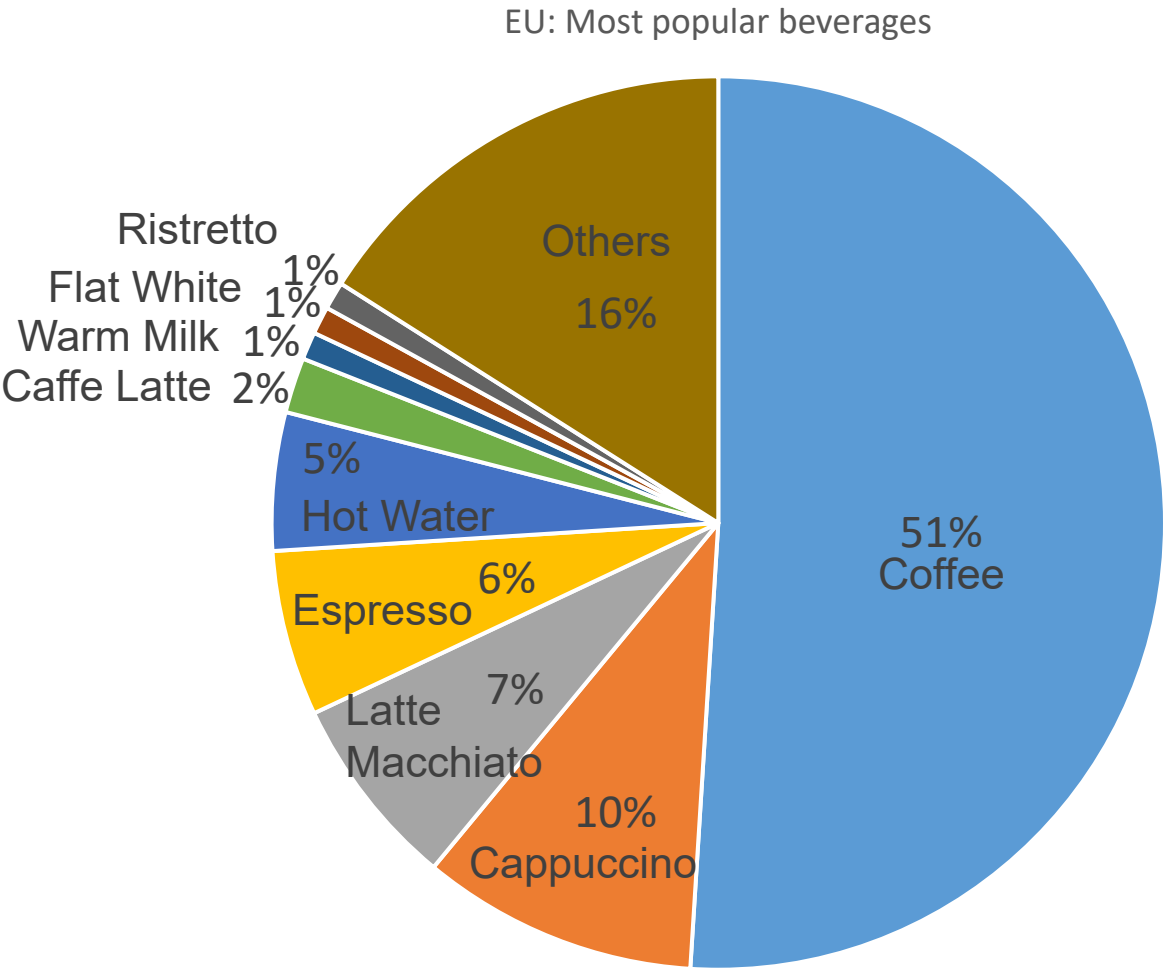
Solution

Avoid program abortion to prolong lifetime of coffeemakers by...

- (1) ...improving user interface & navigation and
- (2) ...changing fill quantity preset to reduce number of program aborts
- (3) ...trigger new technology solutions (e.g. sensor validating cup size)

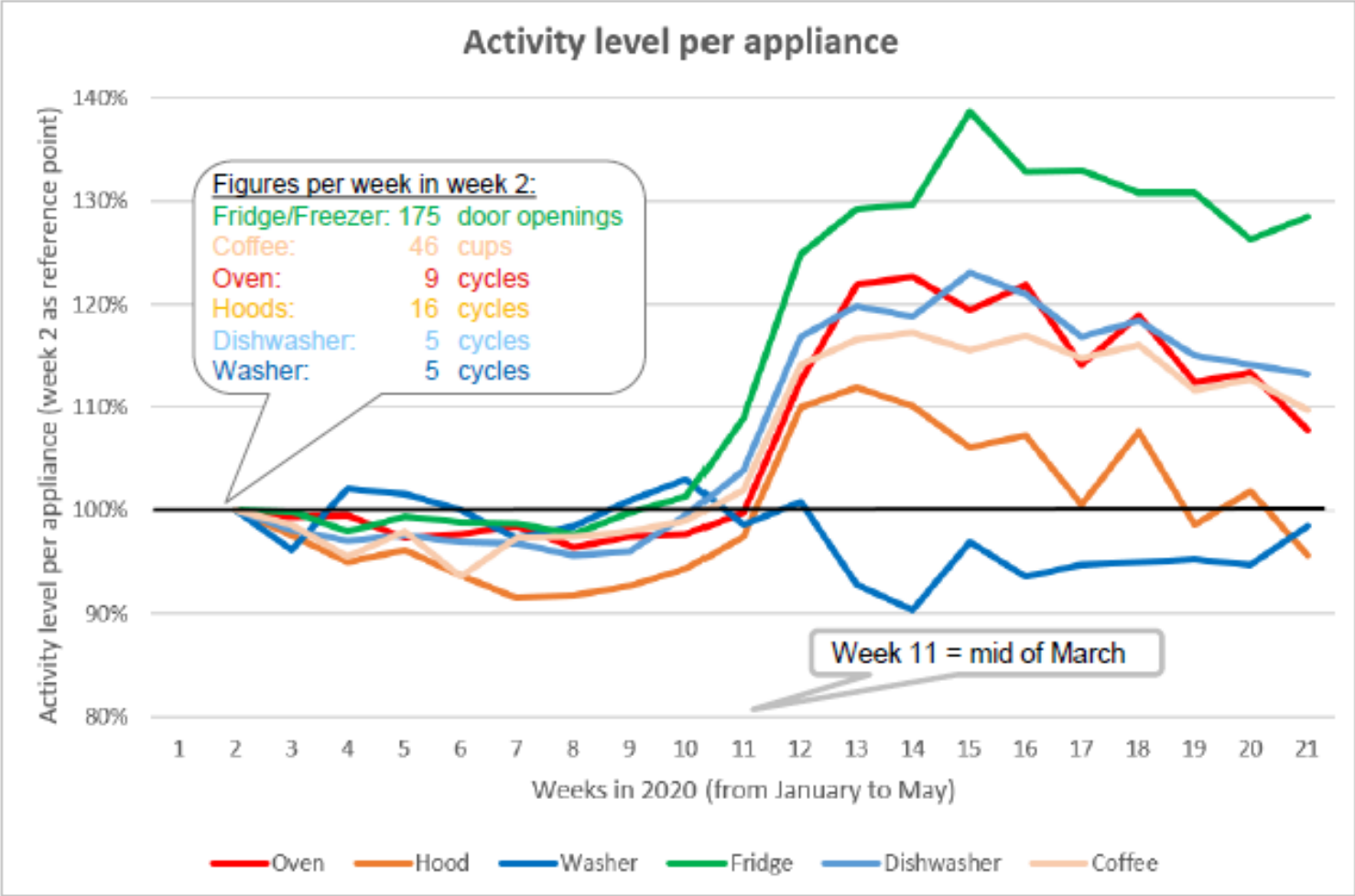
Beverages prepared by Home Connect Fully Automated Espresso Machine

Connected to EU server



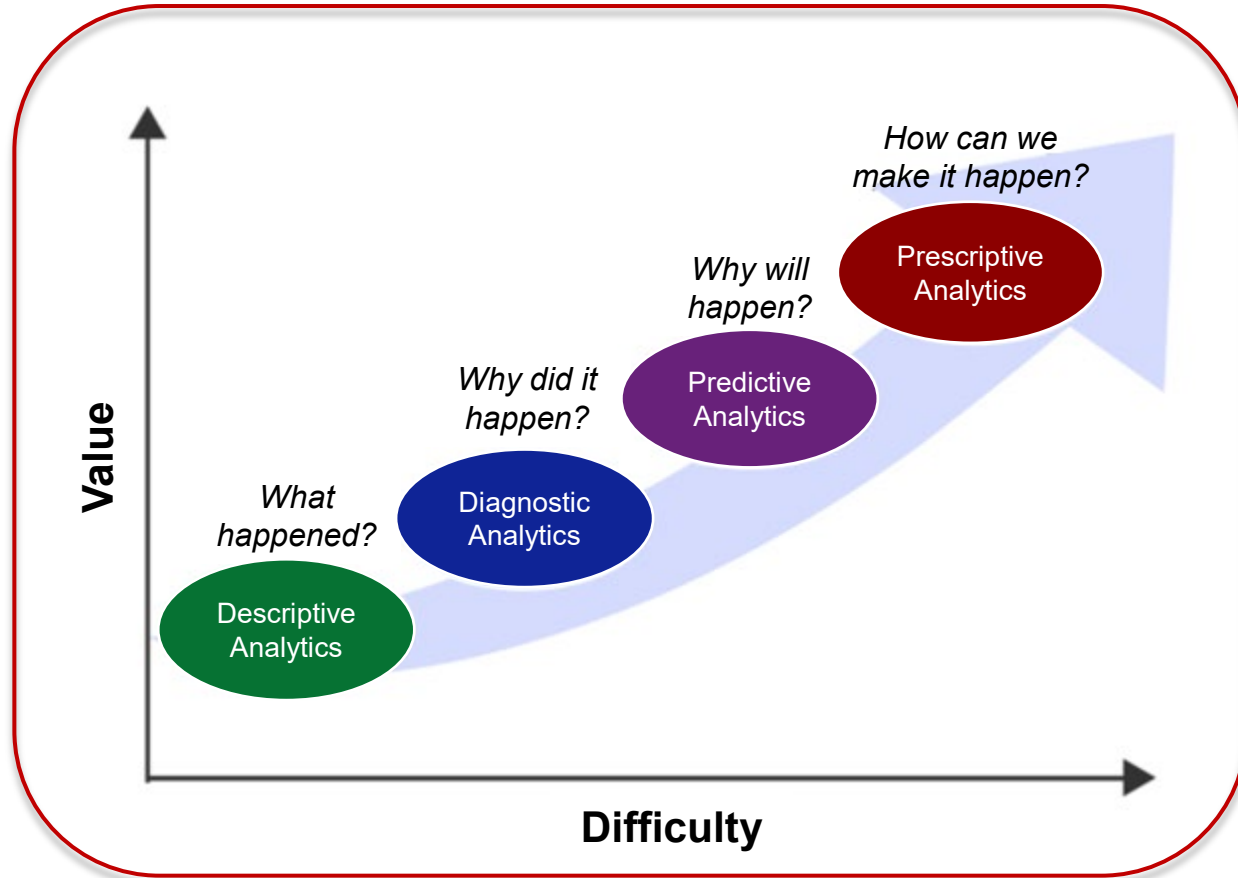
Corona insight: Data shows effect on the activity level of our appliances

(Appliance Analytics: Home Connect appliances connected to the server, BSH total (not only REU))



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Explorative

vs.

Predictive

Understand the customer behavior

Maintenance

Operation

Adjustment

Understanding the machine behavior

Maintenance

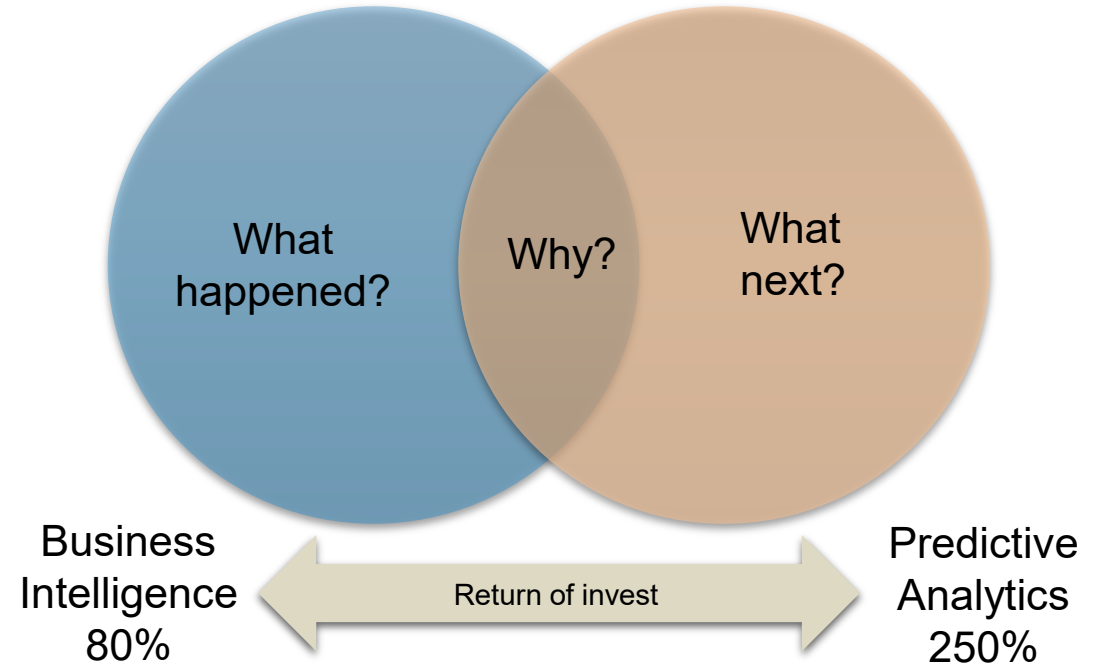
Errors

Feature



Improve our machines and services

Analyze the customer behavior
"Being face to face with our customers"





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Fragen

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