

VOLKSWAGEN

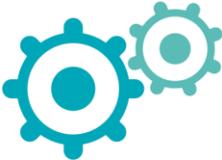
AKTIENGESELLSCHAFT



Organizational embedding of Big Data and predictive analytics

Dr. Florian Neukart | Leiden, 17.11.2015

Some challenges



Management summary Volkswagen Data Lab



Objective

- ▶ Innovative IT-solutions for the digital future of the Volkswagen Group
- ▶ Safeguarding the future: new fields, potentials in current fields



Team & Competences

- ▶ Big Data, Advanced Analytics
- ▶ Connectivity: Connected Customer / Connected Car, Internet of Things
- ▶ IT-Security
- ▶ Data Scientists: Machine Learning, Algorithms, Statistics, Maths...



Use Cases & Cooperation

- ▶ Use Cases in cooperation with partners from various business departments, brands, markets & innovation network



Innovation Network

- ▶ Network including the most innovative IT & technology partners worldwide, extraordinary universities, international startups and the German Accelerator



Scalability

- ▶ International Approach: Shared Services, Technology & Team
- ▶ Scalability of Use Cases to other brands & markets
- ▶ Knowledge Management
- ▶ Qualification



Speed

- ▶ Fast performance and realisation of innovative Use Cases in prototyping environment
- ▶ Hand over to the line function
- ▶ Analytics as a service



Objective



Quick realisation of innovative Use Cases in the areas of Big Data, advanced analytics, connectivity and internet of things.

Customer and business focus



Innovation



Data



Partnering, collaboration & speed

Collaboration with many specialists in the field of Big Data, Advanced Analytics, Connectivity and Internet of Things
Scouting: Start-ups and technologies



Competencies at one glance



Our focus is on developing solutions in the fields of advanced analytics, connectivity and internet of things, whereby expertise and data remain in the company.

Data Lab Services

Use cases	IT-Prototypes	Data protection	Tech-scouting	Start-Up scouting	Design thinking	Big Data Consulting	IT-Security
Machine learning	Deep learning	Tech library	Prototype env.	Flexible partnering	Data visualisation	Text & Data Mining	Anomaly detection

Technologies & partners

Big Data und advanced analytics prototyping environment: separately hosted

Internal & external data sources



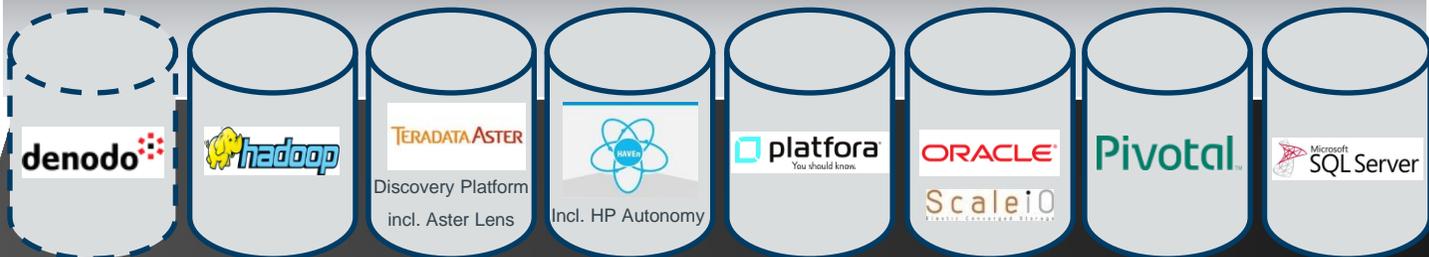
IT prototyping-platform: latest technology stack, secure, fast, and flexible*



Tools for analytics & visualization



Data storage



Data integration



Raw data



In evaluation:

Analytics:

H₂O

ThingWorx

QLIK SENSE

WEKA The University of Waikato

cloudera

MADlib

AYASDI

Encog

1 IT Lab, 1 technology stack, best synergies for evaluation and trials within VW

*extensible at any time

Core competency: digitalization and connected car



- Digitalization
- Mobility & parking
- Connected Car
- Data Lake
- CRM, dealer experience



- Team lead Digital & Connected Car
- Websites
- Configurator
- Mobility & Parking



- PhD. in Data Mining
- Connected Car
- Mobility
- Big Data
- Project lead Mobility at BMW- contractor
- Machine Learning

- Big Data
- Internet of Things, Smart Home
- Big Data Technology-evaluation
- Legal expert
- Sttistic risk models



- Digitalization
- Web Analytics
- Configurator
- Websites, Customer Journeys
- CRM



- Text Mining
- Web Analytics
- Enterprise Search
- Machine Learning
- Visitor stream
- Analysis int. Fairs

Core competency: Data Science and technology



- Statistic
- Cern Background
- Python, R, C++, Matlab
- Machine Learning
- Data Science & Process Mining



- Data analysis
- Machine Learning
- Smart Home
- Robotic
- Python, R, Matlab



Dr. F. Neukart
CTO

- Chief Technology Officer
- Machine Learning / Artificial Intelligence
- Advanced and predictive analytics
- IoT, risk prediction, ...
- Python, R, Java, SPSS, ...



- Machine Learning
- Deep Learning



- Industry 4.0, Computer Scientist
- Handling Factory Data
- Supply Chain Analysis
- Algorithm design (Heuristics,...)
- Java, C++, SQL



- Physicist
- PhD. candidate in pred. Analytics
- Participant Hackathon „Codefest N“
- Data Scientist

- Statistiker für Risikomodelle
- R, SAS, IBM SPSS
- Clustering Verfahren
- Machine Learning

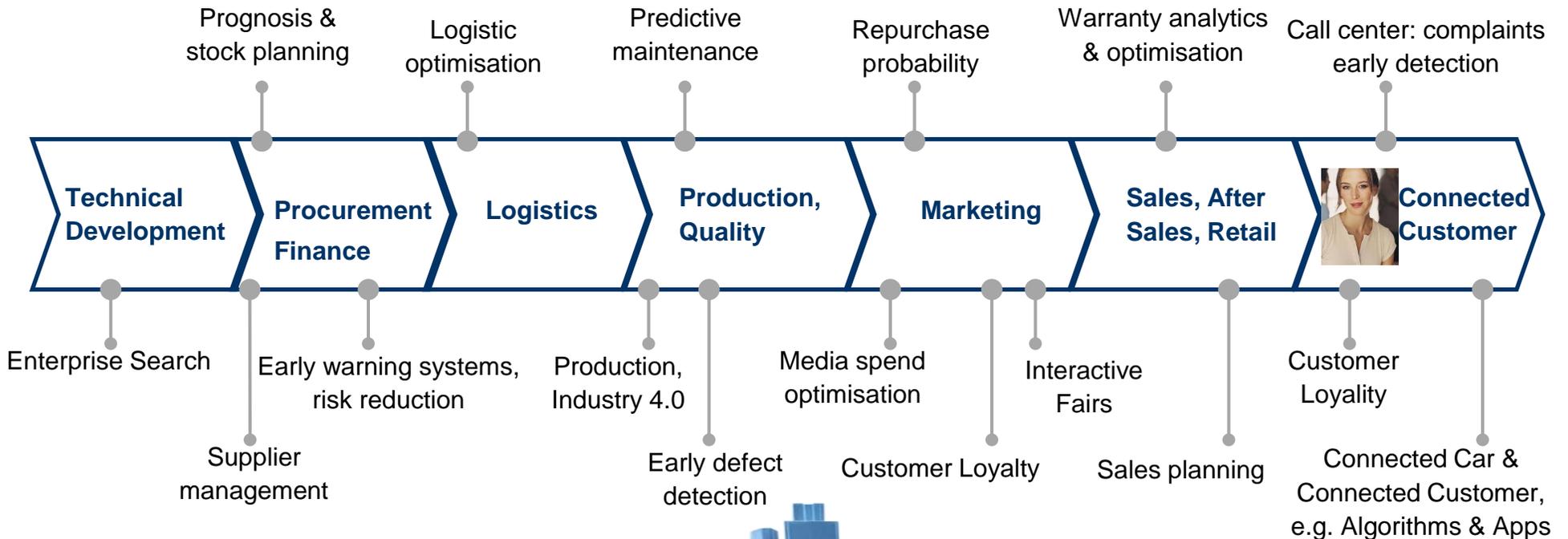


- PhD. candidate “Visual Analytics”
- Recommender Systems
- Human Machine communication



Data lab competences: examples for potential data-driven innovation across the value chain

Examples for Big Data Analytics in selected stages of a simplified Automotive OEM value chain (no demand for completeness)



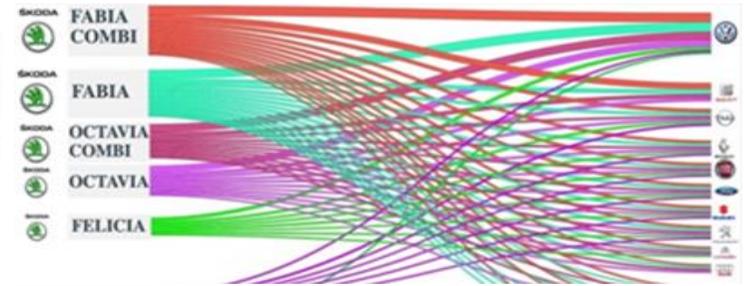
Further Use Cases: Smart Home, Smart City, Big Data for the IT, Cyber Security, etc.



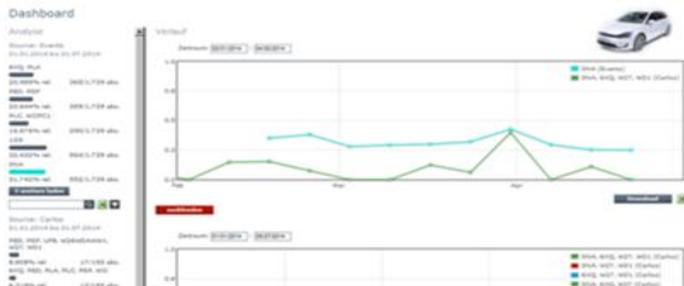
Data lab use cases (overview, examples)



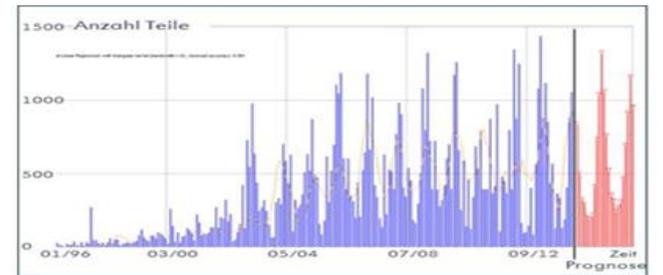
Connectivity: Connected & Customer Car, IoT



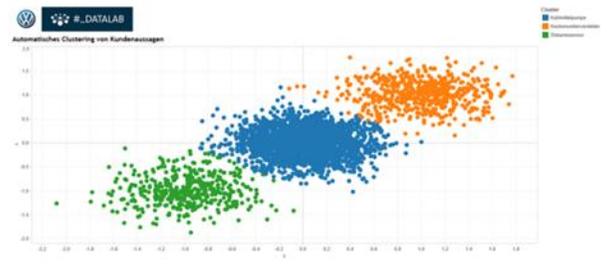
Optimisation of loyalty: Marketing, Sales, After Sales



Customer needs prediction, prediction markets (CHN)



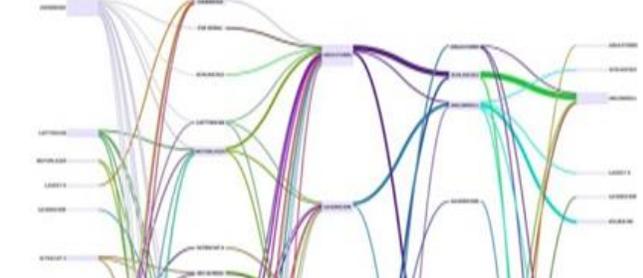
Optimisation of parts prediction, quality



Technical Service: Risk predictions

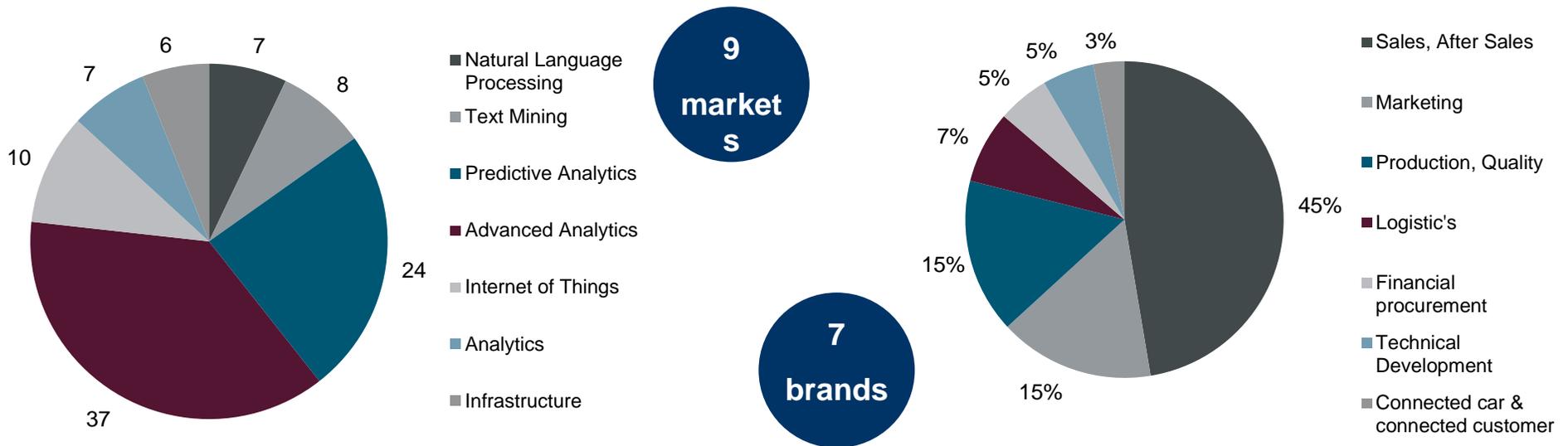


Industry 4.0: Paintshop / Production



Optimisation of After Sales, warranty

Data lab use case overview – facts and figures



> 40 Use Cases requested and in the Pipeline



Data lab innovation network

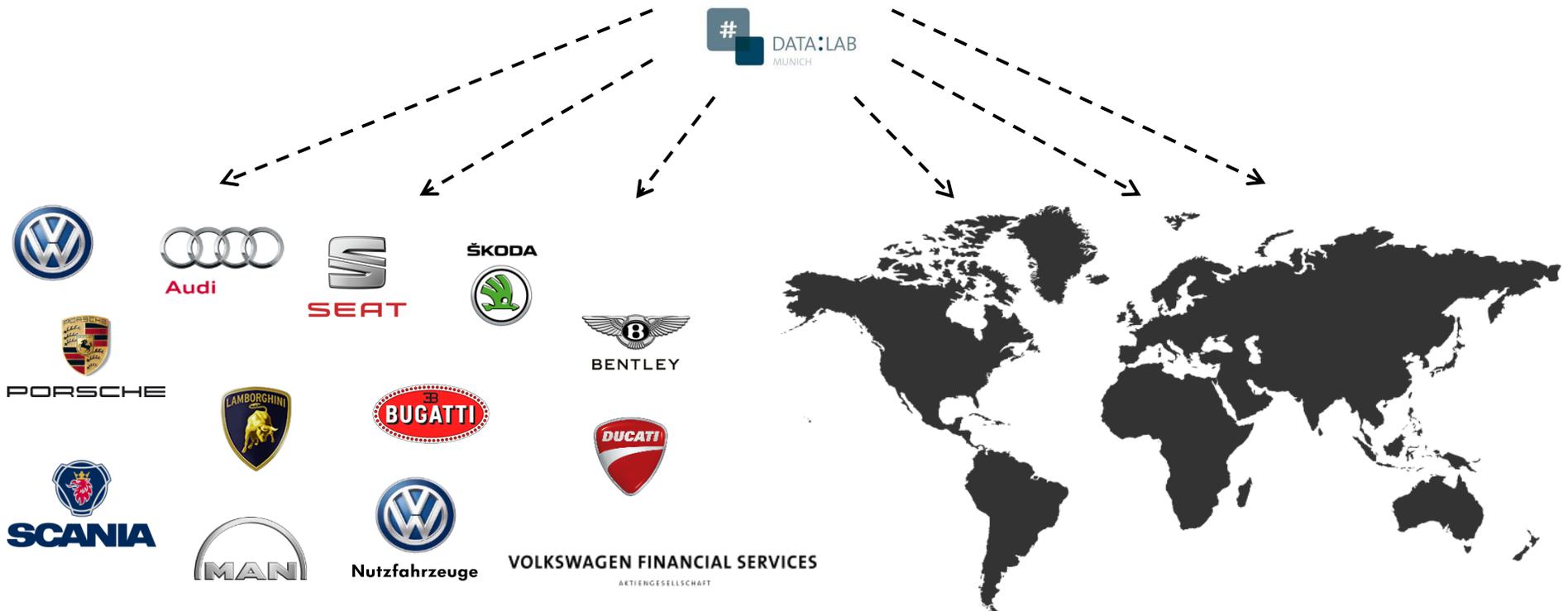




Scalability: use cases and know-how can be transferred to other brands and markets



Scalability / Use Cases



➤ Fast Scaling: Successful Use Cases to other brands and markets

➤ Know-how, data, lessons learned and results provide benefits for the group!



How do we support business?

Development of prototypes & scaling

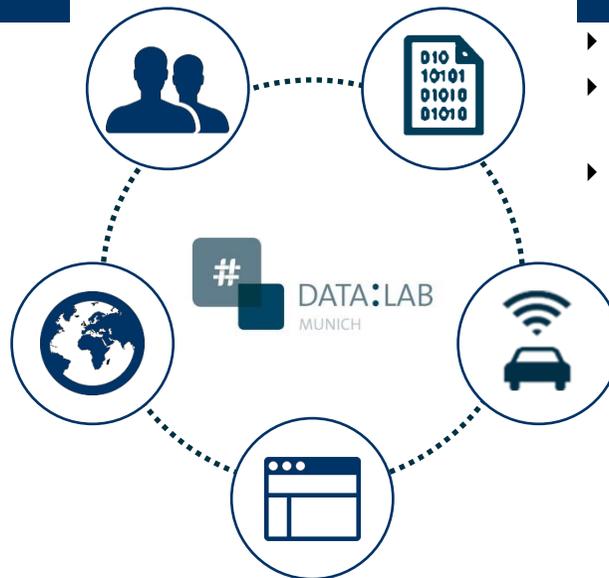
- ▶ Consulting and advice on
 - ▶ Algorithms, statistical methods, Big Data technologies and tools, etc.
 - ▶ Predictions, forecast models, prototypes
 - ▶ Scaling of successful use cases

Technology-Scouting and fast, flexible partnering

- ▶ Markets & IT departments
- ▶ Leading technology partners
- ▶ Renowned universities
- ▶ Dynamic start-ups and German Accelerator

Internal expertise & prototyping environment

- ▶ Big Data & Analytics, digital know-how & experts
- ▶ Internal state-of-the-art prototyping environment
- ▶ Expertise & lessons learned („Use Case Library“, „Tech Library“)
- ▶ Hand over to line function according to 4-phase-model



„Bring your Data“: Integration, Analysis & Visualization

- ▶ Evaluation of data privacy, IT-Security
- ▶ Consolidation and analysis of internal and external data
- ▶ Big Data & Advanced Analytics
 - ▶ Realtime-Analysis & -interpretation, Pattern Recognition
 - ▶ Visualization by the use of newest tools
 - ▶ Recommendations

Big Data Concepts & Use Cases

- ▶ Intense alignment with departments, brands & markets
- ▶ Development of innovative Use Cases
 - ▶ Concept and design thinking workshops
 - ▶ Benefit potential: quantitative & qualitative

Contact Volkswagen Data Lab: datalab@volkswagen.de