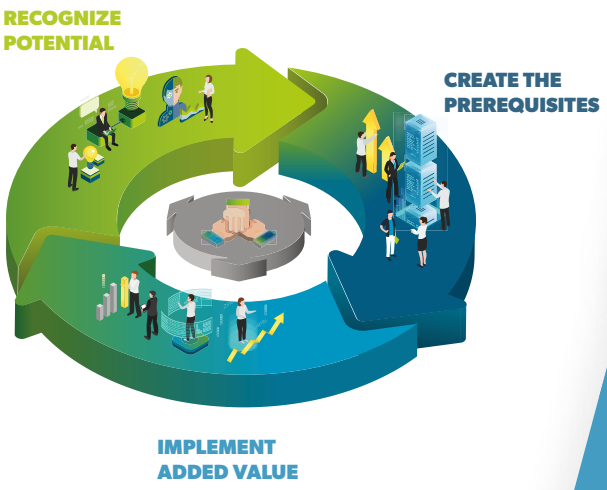
AWK Group

Enabling digital performance.

AWK FOCUS

Data Excellence

In this issue



The various value-added components in a data-driven organization are interacting

01
The Data forms the actual asset and thus the foundation, which is continuously improved with appropriate data governance

02
On this foundation, concrete added value is created with the help of Data Analytics & AI. This motivates the further optimization of the foundation, but also provides new ideas for further potential

03
The potential of the data and the analyses based on it should be systematically identified using suitable methods, which in turn will fuel the improvement of the database and exploratory analyses.

You can start this continuous development cycle with any of these three components, e.g. with a potential workshop, with the creation of an initial overview of the data, or with exploratory analyses - depending on the situation and your preference. However, we recommend to «start small and grow fast».

Data Excellence is an iterative collaboration process

Data

is recognized as an important asset that we have to make use of!

Our AWK Focus «Data, Data, Data» was titled «Data is the gold of the future». Meanwhile, this is widely acknowledged. The digital transformation addresses data-driven enterprises, data-based business models and enables new forms of customer interaction. The big challenge is to create a solid «data foundation» for these applications.
Dr. Christian Mauz

I don't know how many data cleansing projects I have experienced in my career. The situation was always the same: shortly after the project was completed, the data quality quickly deteriorated again. With the ongoing digital transformation and the success of large internet companies such as Google, Facebook and Amazon, it became clear to everyone what treasures lie in data. However, they are still often distributed across different systems without synchronization, insufficiently maintained and poorly usable.

The good news is that innovative technologies now enable us to meet this challenge in a sustainable manner. Modern systems are able to consolidate different data silos distributed throughout the company and to process and use data stored in them. This paves the way for the implementation of new concepts in the field of data governance. Instead of time-consuming data cleansing, an iterative procedure that identifies potential, makes data usable and thus generates added value for the organization is more promising for such projects.

In our present Focus we introduce the AWK Data Excellence approach and show you the progress of data usage in data-driven organizations and business models.

I wish you an interesting reading.

Data Governance

as a basis for Data Excellence

Data and information derived from it must be accessible in usable quality in order to generate added value. Data governance forms the basis for this. We will show you which key functions you can use to lay a solid foundation for marketing your data in an appropriate and profitable manner.

Dr. Christian Häberli, Raphael Hasler

Why data governance?

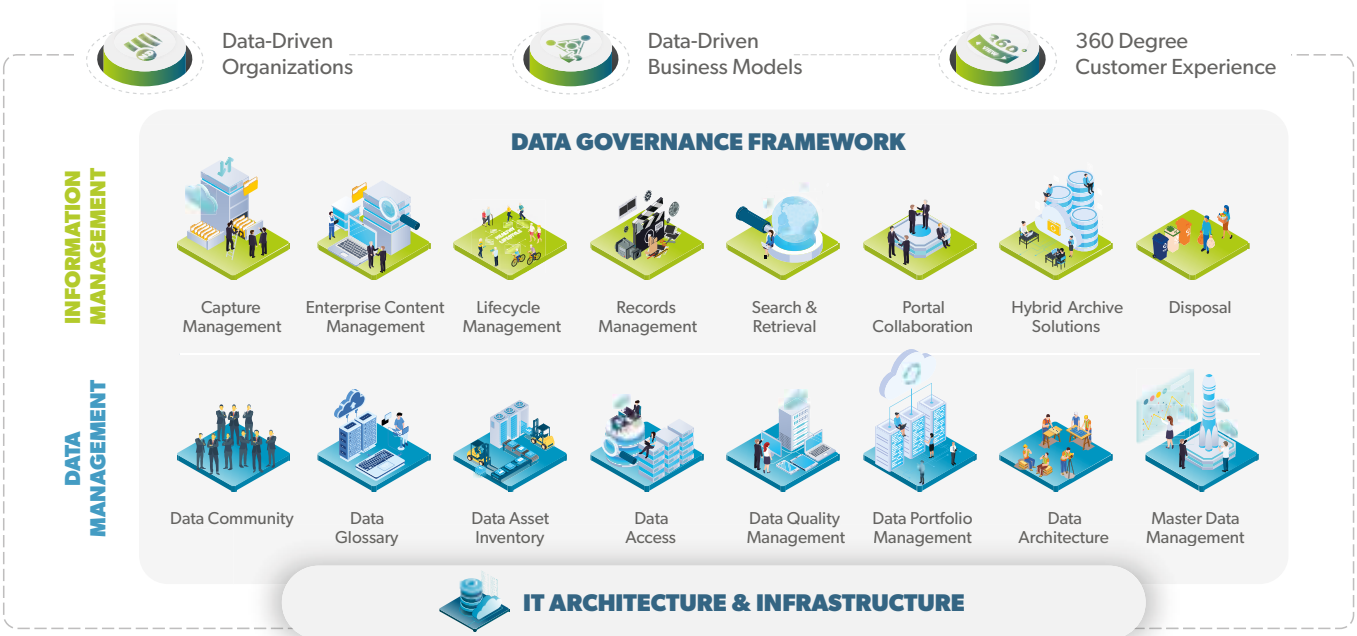
The requirements for data have continuously increased in recent years and continue to grow, whether due to regulatory requirements or changing business models. For example, the Data Protection Act aims to ensure that customers can exercise their rights to personal data and make far-reaching demands. Anyone who wants to meet these demands efficiently would do well to establish solid data governance.

What does solid data governance include?

Data governance is often identified as an IT topic and is therefore considered a purely technical task. The key element for the successful implementation of a functioning data governance is the interaction between the business departments, compliance and IT. Ideally, management is assigned to the business department.

AWK Data Governance Framework

The AWK Data Governance Framework is anchored in the company by means of directives, standards and guidelines. First and foremost, data governance must be established with a well thought-out organization. This is based on an integrated data and information management (*see illustration*), which consists of eight key functions each. These functions form the necessary building blocks,



AWK Data & Information Management Model

whose maturity level can be raised iteratively to the required level. To achieve the required effectiveness, the Data & Information Management key functions are combined. Below we present the key functions of Data Management and Information Management.

Data Community

The people in the data community «animate» the organizational framework for data management. They adopt roles and form the coordination and steering committees that effective data governance requires. The committees are of central importance for networking across departments, for example, to agree on comprehensive data exchange processes. The organizational form of the data community is intrinsically designed for decentralized task fulfillment. Such an organizational form makes it possible to effectively combine the similar roles (e.g. data steward or data owner) that are often distributed among numerous group companies or business units. An essential step in this process is to define responsibility for the individual data sets. At the same time, the defined roles and committees ensure that guidelines are applied and that the data quality providing the basis for the value-added use of the data stocks is monitored.

Data Glossary

The process of building the data glossary serves primarily to develop a common terminology within the data community. The data glossary as a result creates a uniform understanding of the data stocks of a company and provides a central communication basis.

Data Asset Inventory

The Data inventory provides an overview of internal and external systems in which data is stored and managed. It also links the entire data stocks to the underlying legal and/or regulatory requirements and to the responsibility for data. In many cases, a distinction is made between three levels for such an inventory: 1. systems as a whole (e.g. databases or data collections), 2. breakdown into entity types, 3. breakdown into individual attributes.

Data Access

The core function Data Access determines which groups of persons have access to certain data records and under which conditions respectively where there is a duty of inspection of the person concerned. The data owner releases data for transfer to third parties.

Data Quality Management

Data Quality Management defines the quality standards for the individual data sets and includes the processes and metrics for checking compliance with standards as well as necessary cleansing procedures. The Data quality itself is defined as the suitability of the data for use for a specific purpose. Central to this are quality standards at attribute level for the «golden records», which ensure the distribution of high-quality and thrustworthy data.

Data Portfolio Management
Data Portfolio Management creates the interface to Project Portfolio Management. As a rule, adjustments are made to the data landscape in the context of projects or operational adaptation plans (changes) to existing information systems. Data Portfolio Management is concerned with identifying and actively controlling the interdependencies between these projects and their effects on productive information systems. As with the data catalog, this function can also be performed at different levels of detail, i.e. from a very rough view at the level of projects and data collections to a fine-grained view at the level of individual entity types or attributes.

Data Architecture
Projects and changes are implemented on the basis of a construction plan, which is recorded in the data architecture with regard to the data stocks. The Data architecture (not to be confused with data modelling) defines the basic structures and principles of data stocks and their relationships to one another throughout the company. It regulates which data is managed in which systems. It documents the current status, defines a mutually agreed target status and shows the structures of the main transfer steps. The Data architecture is thus seamlessly integrated into the business architecture and the architecture of the underlying IT infrastructure.

Master Data Management
The Master data is the status-oriented data that describes the key business objects of a company. Often this is the master data of articles, customers, employees and means of production. In contrast to transaction data (for example, the stock of an article at a certain point in time), master data remains relatively constant in volume and has a low frequency of change. Since master data is used to control processes, it must not only be managed with particular care, but also meet the highest quality standards. Master Data Management is therefore reported as a separate key function, although it essentially includes the core functions described above. Reference data is a special form of master data: These serve to classify master data (e.g. abbreviations and codes for currencies or countries).

As soon as the key functions of Data Management have reached a certain level of maturity, the beneficial functions of Information Management can build on them.

Capture Management
Capture Management serves as an interface to the outside world of a company. It deals with the receipt or acquisition of information in structured and unstructured form. Unstructured information, such as physical mail or handsigned contracts, is transformed into evaluable and machine-processable form without compromising its information and evidence value.

Enterprise Content Management
Enterprise Content Management (ECM) provides tools for the collection, processing and use of information within a company. An ECM system is capable of integrating different storage technologies and thus provides an overall view of the information available in the company.

Information Lifecycle Management
Within the framework of Information Lifecycle Management, information is maintained throughout all phases of its lifecycle - from its creation and processing, through approval and storage, to its destruction. The central element is the division into «records», which means business-relevant information that is subject to legal retention regulations, and «non-records» that can or should be destroyed after a short time for operational reasons. The records are compared with the legal requirements and divided into storage classes. Information Lifecycle Management forms the basis for the controlled destruction of information in the context of the key function disposal.

Records Management
Records Management ensures the authenticity, reliability, integrity and traceability of the records and thus guarantees the value of the information and its suitability as evidence. For this dedicated Records Management systems or corresponding, unchangeable information carriers in connection with an ECM-system can be used. Records Management is the key function that frequently deals with the identification, interpretation and transfer of legal or regulatory requirements into technical or organizational basic requirements for Information Management.

Search & Retrieval
Search & Retrieval organizes the search, retrieval and use of the stored information. Information should be findable within a reasonable period of time and be available in appropriate quality at the time of decision making. Capture Management and ECM create the basis for indexing and extracting information and making it quickly accessible.

Portal & Collaboration
Existing information is displayed on a portal and can be edited in teams. This key function provides the tools and methods for collaborative processing of information and builds on existing Data & Information Management functions.

Hybrid Archive Solutions
Hybrid archive solutions create the prerequisite for physically available information to be linked to the digital context. The goal is to organize information independently of media and to dispose of or delete it after the retention period has expired. For example, it can be helpful to link the handwritten contract for the sale of a property with the corresponding transactions and to destroy it at the appropriate time or to hand it over to an institution for final archiving.

Disposal
Once archived information has reached the end of its life cycle, it is marked for destruction. The destruction must be released by the relevant data owner (see Data Community). The release is documented for traceability purposes. Destruction not only reduces the load on operational systems, but also supports compliance with legal requirements.

The functions of Data & Information Management are never an end in themselves, but are necessarily dependent on the results of the data analysis functions for their development. Experience shows that the most successful initiatives are those in which the data and information specialists work hand in hand with data scientists.

Data Analytics

Success factors on the way to a data-driven organization

The actual value creation of data – and thus the iterative implementation of use cases – interacts with the definition of the business models and the provision of data. But what ist the best way to proceed? Initial analyses can be done quickly. But the path to the productive Data Analytics & AI component as the core of new business models involves much more. We show you how to avoid lurking pitfalls and achieve your goal.

Dr. Jonas Dischl

The launch: Pragmatic, agile and interdisciplinary

The good news is that you do not have to make costly investments in tools or infrastructure because established data science specialists often work with open source tools. In addition, initial «Proofs of Concept» (PoC) do not yet require extraordinary computing power in most cases - and if they do, they are available to every company via cloud solutions.

There is also no need to «tidy up» and prepare your data in a time-consuming manner before you start with the first analyses. Data scientists are used to work with incomplete data in raw form. They gain detailed insights into the form and quality of the available data, which supports the development of systematic data management and data governance. In this way, data provision (data management and governance) and data analysis are improved simultaneously and iteratively.

= Customer-centric and iterative procedure: the business model is constantly being further developed and adapted to the customer's specific needs.

The implementation of use cases to market maturity is an agile and iterative process.

An interdisciplinary and closely cooperating team is crucial for successful PoC. This team consists of experienced data scientists, who translate business questions into analytics problems (so-called analytics translation), and technical specialists who know the relevant data and business processes in detail. At the beginning, PoC can be very sharply defined with fixed evaluation criteria. In addition, explorative PoC also have their raison d'être, as they can deliver decisive new discoveries. It is important to maintain the alignment with strategic business models and to proceed in a goal-oriented manner.

The checkpoint: Evaluation and further development

Work is done in short iterations. After each iteration, a forecast is made as to whether data will generate the expected added value. For this purpose, the defined business case with the targeted ROI is compared with the forecast. The achieved result is determining for the decision regarding the next iteration.

It should be noted that PoC or MVPs («Minimal Viable Products») are by definition not yet complete or perfect as the often numerous special cases and relevant details are not considered. In addition, analytics solutions are often learning systems that are constantly improving step by step based on user feedback.

As a result, the first results become vulnerable to expectations that count on a finished product after a minimal initial investment. A premature termination or the silting up of PoC iterations can be the consequence. Management commitment, expectation management and good communication are therefore crucial.

An experienced team develops the right mix of facts and intuition when working with data. In this way, it is possible to assess whether it is worth pursuing a use case. If there is a willingness to invest consistently in promising use cases, the biggest pitfalls of this phase are mastered.

The finish line: Keep the ball rolling

Those who keep the ball rolling, develop the right PoCs or MVPs and bring them to production maturity are on the finish line.

Numerous Swiss companies and organizations are currently at this point. Initial tests with data analytics show potential. Now it is a matter of bringing the solutions into production. This is no trivial step. It requires not only willingness to invest and foresight, but also the consideration of technical, procedural and organizational aspects.

A powerful data analytics or AI model alone does not ensure productive added value. The productive integration, introduction and use of data analytics components as the basis of data-based business models involves more than the implementation of models.

Depending on how the analytics component is integrated into the new business model, minor or major adjustments to the business processes are required to achieve real added value. For example, the processes must enable users to provide ongoing feedback on the decisions that the component calculates. This enables the solution to be continuously improved.

As always, when major adaptations are required, systematic change management helps to pick up users and get them excited about the new possibilities offered by data-based business models.

Use productively and move forward iteratively

Once the first data-based use cases and business models have been implemented and the first added value is visible, ideas for further use cases are usually not long in coming.

With the insights gained, new potential becomes visible. The successful achievements motivate further investments. The iterative cycle, which extends from the identification of data-based business models to the preparation and provision of the relevant data and the implementation of the use cases, is gaining momentum. The productive solutions are maintained and iteratively improved, new ideas are taken up and tested in short cycles.

This is what makes the so-called «data-driven organizations» so successful.

Data-based business models

Tapping the full potential of data

Data is often considered as the new oil. The relevance of data for the optimization of processes in production, sales, marketing, logistics or finance has long been recognized by companies. Recently, new, data-based business models in particular have been gaining increasing attention. These allow companies to secure existing revenue streams or to tap new sources of income. In the following, we explain what a data-based business model comprises and what types are available. Furthermore, we use a concrete example to illustrate how data-based business models can be developed.

Dr. Boris Ricken, Dr. Gilles Pütz

Data can be used in business models in three ways (*see illustration 1*):

1. **Optimization** of an existing business model, for example, by making a company's logistics more cost-efficient through data analytics
2. **Extension** of an existing business model through data, for example by equipping production machines with sensors that enable additional services (condition monitoring, predictive maintenance)
3. **New development** of a completely data-based business model, such as a hotel rating platform for travelers

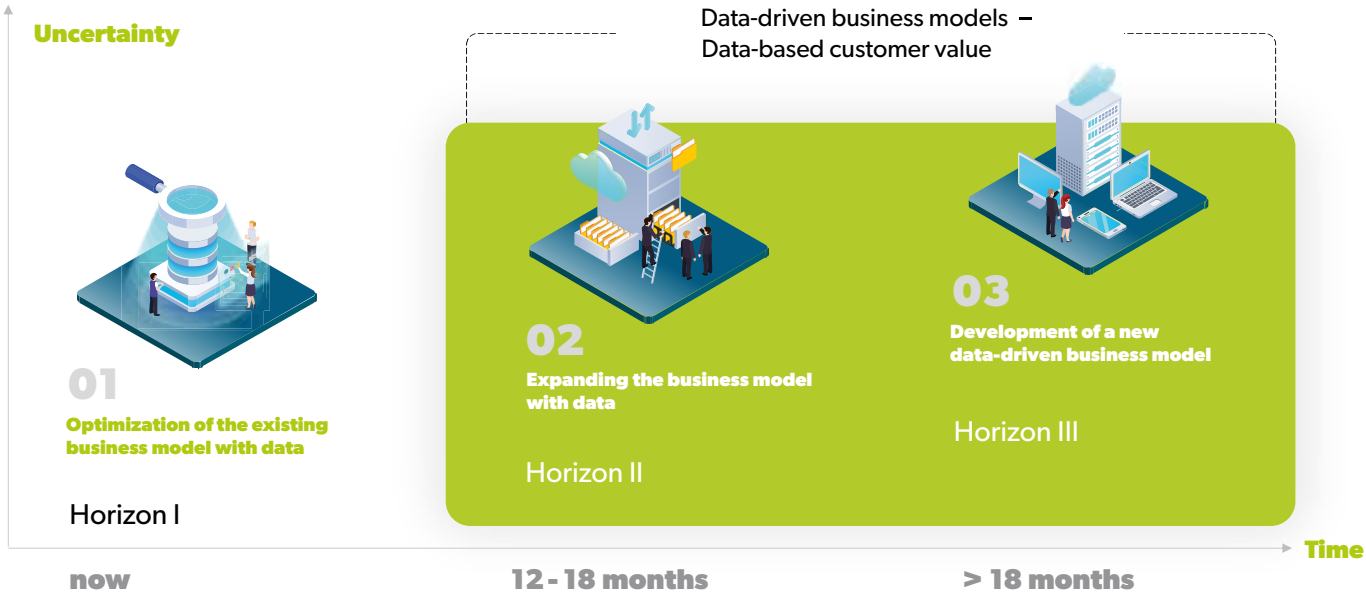


Illustration 1: Use of data in business models

Data-based business models include types 2 and 3, the goal being to use data to create **value for the customer** and thereby generate new revenue or secure the existing revenue base. Companies often start with an optimization (1) and then expand their existing business model (2) in a next step, as this can be realized in a timely manner and is usually associated with lower risks and investments than a disruptive new development (3).

How can new, data-based business models be developed? We would like to explain the development using a concrete example. For this purpose we use a mechanical engineering company with an **IoT service** (*illustration 2*). The manufacturer wants to equip his production machines (level 1) with sensors (level 2) and connectivity (level 3), and use data analytics (level 4) in order to provide digital services in the area of condition monitoring and production optimization (level 5).[1]

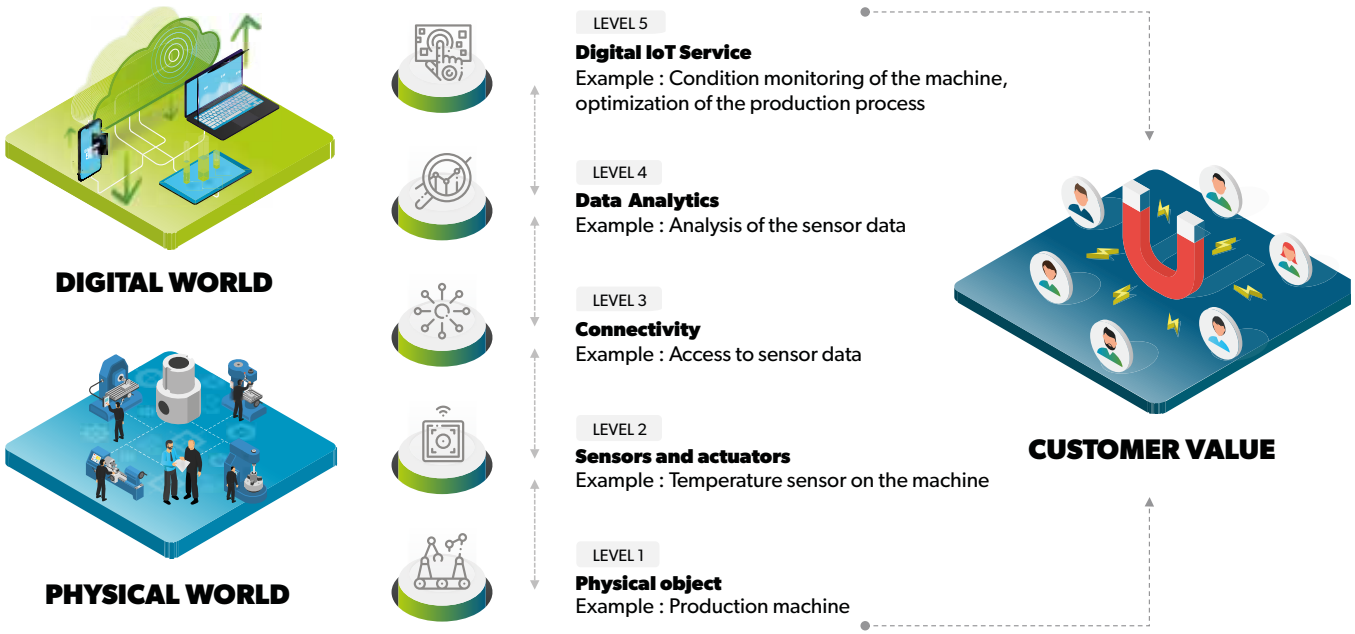


Illustration 2: IoT business model

To this end, our machine builder proceeds in four steps *(illustration 3)*.

Phase 1 – Definition Value Proposition
The machine builder defines a data-based product offering based on the tasks, pains and gains of his customers. Customer «pains» can be, for example, downtimes or low quality of the manufactured parts. These are to be solved by the digital services «Condition Monitoring» and «Production Process Optimization».

Phase 2 – Business Model Design
Using a Business Model Canvas, further elements of the data-based business model are designed in a workshop:

- **Customer segments:**
  Which customer segment should be addressed?
- **Channels:**
  How should the new service be marketed?
- **Partners:**
  Which partners should the machine manufacturer involve for the collection (sensor suppliers) and the evaluation of data (analytics suppliers)?

[1] Cf. E. Fleisch, M. Weinberger, F. Wortmann (2014). Business Models and the Internet of Things. Bosch IoT Lab Whitepaper

- **Revenue structure:**
  Should the new IoT services be sold as an add-on to the existing product, on a one-off basis, as a license or according to a pay-per-use model?

Phase 3 – Business planning
Once the business model has been defined, its financial profitability must be checked for plausibility in a business and finance plan.

Phase 4 – Implementation
For data-based business models, implementation according to the Lean Startup method and the principle «Build - Measure - Learn» is recommended.

For our machine builder this means that he should introduce, test and further develop a minimum viable product of his IoT services at a pilot customer at an early stage.

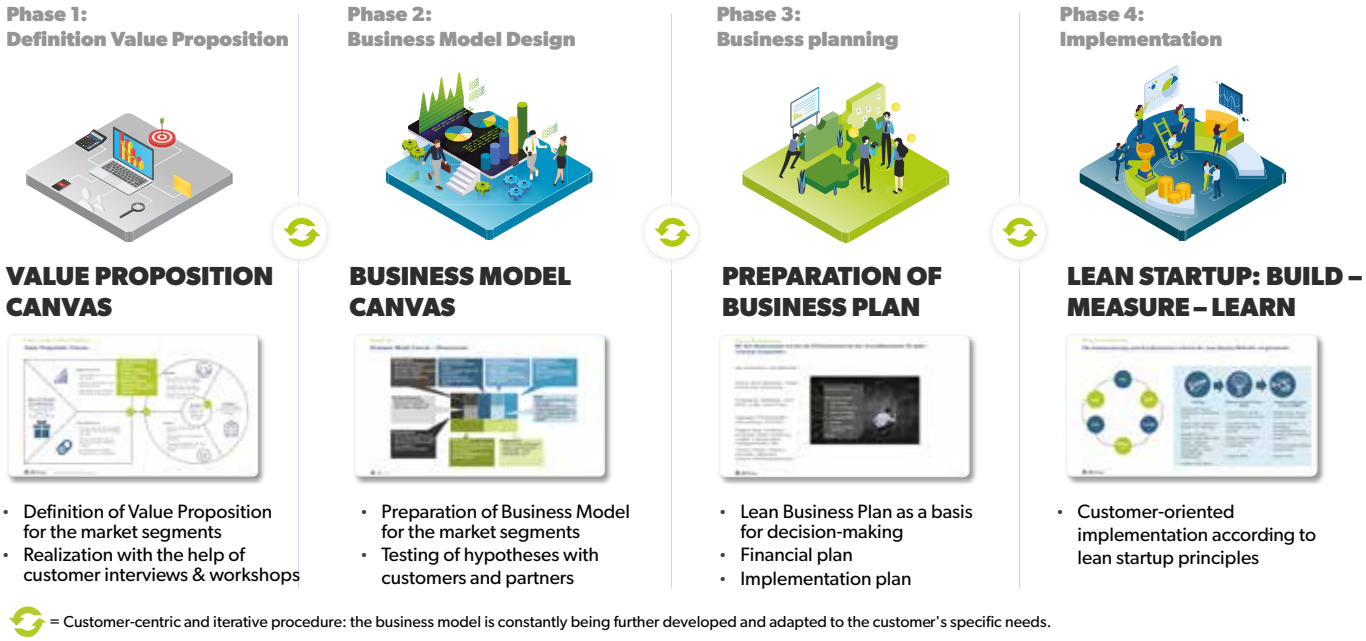


Illustration 3: Procedure for the development of data-based business models

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We would be pleased to support you on your way to a data-driven organization and help you to optimally develop existing potential and to successfully master entry hurdles.

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