



Digital Business Model Innovations

Controlling in the Digital Transformation

Dream Car of the ICV's Think Tank in 2017/2018

In cooperation with



With experiences and examples from the following companies



DAIMLER

KUKA



Table of contents

Management summary	II
Introduction.....	III
1 Controllers must participate in the implementation of digital business model innovations!	1
2 What are digital business model innovations?	3
2.1 Components of a business model.....	3
2.2 Framework for classifying digital business model innovations	6
2.3 Success factors of business model innovations	12
3 Controllers as business partners when developing/implementing digital business model innovations	13
3.1 Corporate strategy is the starting point	13
3.2 Phases of digital business model innovations	14
3.3 Overview of new innovation methods and tools	19
3.4 Controller's tasks and requirements.....	24
4 Application examples from corporate practice.....	25
4.1 Digital business model innovations at Zalando	26
4.2 Digital business model innovations at Daimler	32
4.3 Digital business model innovations at KUKA.....	38
4.4 Digital business model innovations at Deutsche Bahn	42
5 Conclusion: Master the digital transformation with the help of controllers!	49
Literature recommendations – Journal contributions.....	VII
Literature recommendations – Books	VIII
Bibliography.....	IX

Management summary

Comprehensive digitisation involves the **potential for disruptive change** to the business models of companies. Especially in recent years, companies such as Amazon, Uber and Mister Spex have demonstrated with their digital business model innovations how the rules of competition and industry structures can fundamentally change within a very short period of time. Digital business model innovations, however, are relevant not only for former start-ups and digital pioneers. They also offer **new opportunities to established companies** that will enable them to expand their business activity. For example, Daimler, the automobile manufacturer, founded car2go, a car-sharing service that allows users to book a reservation using a smartphone app and which today is the market leader in flexible car-sharing.

The successful implementation of digital business models is primarily dependent on **management decisions**. In this context controllers, in their capacity as business partners of management, must adequately support decision-makers regarding digital innovation issues.

When analysing in depth the supportive role played by controllers, it is important to distinguish between **two key perspectives**: first, controlling supports the process by acting as an **enabler** for the development of digital business model innovations, and second, the implementation of such business model innovations must be seen as a **driver** for making changes to controlling itself. This perspective as an enabler means that the controller provides support for the phases of innovation, specifically **“brainstorming”, “assessing ideas”, “implementation” and “ongoing operations”**. From a controlling perspective, brainstorming means, for example, determining how products and services can be priced in the context of a business model innovation, determining which markets to develop, or forecasting revenue growth. Assessing an idea involves determining what value the digital business model innovation will contribute to the company’s success. The focus of the implementation phase is on the design of a performance management system that is suitable for digital business models. As soon as the digital business model innovation has been established, the controller must then track the associated revenues and costs in a management profit reporting that is appropriate for ongoing operations. The second perspective focuses on the **digital transformation of controlling** itself. A complete, transformative approach involves **four fundamental areas of activity**: processes and structures, methods and tools, roles and identity, and capabilities and cooperation.

By taking a holistic view of these two perspectives and performing the associated tasks, the **controller is able to make a significant contribution to the successful implementation of digital business models**.

Introduction

The **ICV's Think Tank** aims to monitor the controlling-relevant environment in a systematic manner in order to identify significant trends. When doing so, the Think Tank develops the ICV's "Dream Cars" in order to make a significant contribution to the **awareness of the ICV as a thought-leader in the financial and controller community**. The ideas and findings are then transformed in ICV expert work groups into products that can be applied in practice.

The Think Tank's ambition is to always address highly relevant, innovative issues in order to provide the controller community with important new ideas. Its focus in recent years has been on digitisation in particular. In this context we have dealt with a number of important issues, including Big Data, Industry 4.0 and Business Analytics. Our resulting Dream Car reports have provided important impetus for the controlling profession. Digitisation remains a focal point this year as well. Specifically, we have dealt with the subject of **digital business model innovations and the role the controller**.

The heads of the Think Tank are:

- Prof. Dr. *Ronald Gleich* (*EBS University of Economics and Law, Oes-trich-Winkel, Professor; Horváth Akademie GmbH, Stuttgart Executive Partner*)
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Several partners from both within and outside the ICV continued to support the core team's work this year as well, including the following experts:

- *Dr. Jörg Engelbergs (Zalando SE, Berlin, Vice President Controlling)*
- *Paulina Issmer (Zalando SE, Berlin, Senior Finance Controller Advertising Business)*
- *Julius Niehaus (Daimler AG - Mercedes-Benz Cars, Stuttgart, CASE Portfolio Controlling & Development)*
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- *Philipp Lill (KUKA AG, Augsburg, Advanced Technologies)*
- *Wolfgang Heinrichs (Deutsche Bahn AG, Berlin, Head of the FINANCE 4 DB Group Programme)*

We would like to sincerely thank them once again for their willingness to support the work of the ICV Think Tank and for the contributions they made to this Dream Car report. We would especially like to thank Mr. *Goran Sejdíć*, who has taken over the editorial work and the coordination of the ICV Think Tank.

We wish you interesting reading and hope you will obtain new ideas for your daily controller work.

Best regards,



Siegfried Gänßlen

representing the Board of the International Association of Controllers



Prof. Dr. Heimo Losbichler



Prof. Dr. Ronald Gleich



Stefan Tobias

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1 Controllers must participate in the implementation of digital business model innovations!

The ever-mounting digitisation of processes, products and networks due to new software and diverse innovative technologies offers enormous potential for the disruptive change of business models in nearly all industries. In the retail industry, for example, **Amazon** and **eBay** recognised early on that digitisation offers significant possibilities for the implementation of their Internet-based business models. Today they are very successful in the market. Other typical examples of digitisation-related change and re-engineering potential for business models include **Netflix** (online streaming video store), **Uber** (taxi agency), and **Mister Spex** (online optician).

A look at the development of market capitalisation shows that today the top 5 companies all have a business model that is strongly or predominantly shaped by digitisation. Over the years, companies without a largely digital business model, such as the energy giants Exxon and Shell, have completely disappeared from the top-5 list (see Figure 1).

Top-5 companies have digital business models

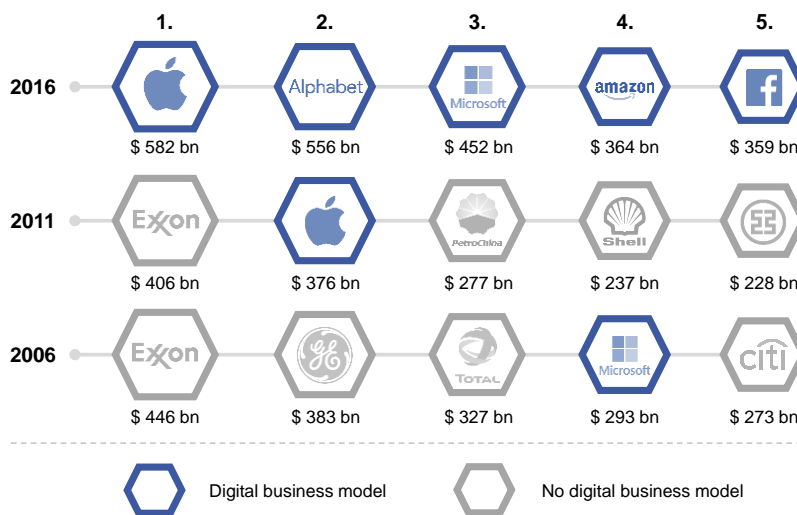


Figure 1: Companies with the largest market capitalisation (based on statistics from Deutsche Bank 2017)

However, digital business models are relevant not only for former start-ups and pioneers. Established companies are increasingly implementing digital business model innovations too. **Daimler**, the automobile manufacturer, has founded car2go, a car-sharing service. This service allows customers to search and book freely-parked rental cars within the city limits using a smartphone app. Once the customers are done using the rental car, they can return them to any public parking space within the car2go operating area. Today car2go is the market leader in the business of flexible car-sharing.

However, comprehensive digitisation has not been a success story for many established companies. Quelle and Nokia, for instance, are examples of companies that experienced the devastating consequences of incorrect management decisions regarding the assessment of digitisation's potential. **Quelle**

once had the world's most modern distribution warehouse, in which the shipment data of parcels were processed electronically for the first time. When Amazon began selling goods over the Internet in 1994, Quelle's management negligently underestimated the Internet as a distribution channel and Amazon as a competitor. Years later, when Quelle finally ventured online, it was then too late, and in 2009 the company filed for insolvency. **Nokia** in 1998 replaced Motorola as the leading provider of mobile telephones, and held this top position for many years. In 2007 Apple then launched its iPhone, which featured a touchscreen and apps, and triggered a smartphone boom. Although Nokia had been one of the first companies to launch in the market an internet-capable mobile phone, the company missed out on the boom, and thus realised only when it was too late the potential that apps would have on the expansion of its own business model. As a consequence of its cumbersome, innovation-sceptical corporate strategy, Nokia suffered a sharp drop in sales and eventually lost its dominance in the mobile phone market.

These negative examples are particularly good illustrations that the successful implementation of digital business models depends on more than just technological and financial resources. Rather, the successful positioning of a company in the digital age depends on **management decisions**. Here it becomes clear that controllers must also deal with digital business model innovations, because their role as a business partner of management makes their support and assessment an indispensable input for important strategic decisions. But when managers are making these decisions, which innovation questions require support from controllers? How exactly can controllers help managers to address digitally-influenced innovation questions? Which methods or tools, either new or those that have already proven themselves in innovation management, are available to controllers for this purpose? Today such questions are highly relevant and require urgent answers.

This Dream Car report aims to fulfil this need and provide all aspects of the controller community with an understanding of the issues related to digital business model innovations.

Controllers must deal with digital business models

Structure of the Dream Car report

- Initially we will review what specifically is meant by the term digital business model innovation, and what different categories or types need to be distinguished (**Chapter 2**).
- We then discuss how controllers can contribute to the development and implementation of digital business model innovations, and what new innovation methods are available to controllers to make that contribution (**Chapter 3**).
- Based on practical examples we will then clarify the role of the controller in digital business model innovation (**Chapter 4**).
- Finally, the report is rounded off with a summary conclusion (**Chapter 5**) and literature recommendations.

2 What are digital business model innovations?

2.1 Components of a business model

Although the term “business model” began to appear in academic publications at the end of the 1950s, it was increasingly used in actual practice only in the middle of the 1990s with the emergence of the “**new economy**”. Numerous firms were established at this time (so-called start-ups), which recognised early on the potential of using the Internet for commercial purposes. To implement their innovative business ideas, these start-ups were often dependent on debt, which they obtained from a wide variety of investors (see Wirtz 2010, page 7f). In this context, start-ups faced the challenge of convincing potential financiers about the merits of their companies. They had to clarify the promising business idea of their own company, differentiate it from other companies, and explain its competitive position. The summary and explanation of these aspects were referred to, often without any further definition, as a business model (see Stähler 2002, page 37).

In order to gain a basic understanding of the term “business model”, it is first necessary to connect it with more established terms of strategic management, such as “vision” and “strategy”. A **vision** describes a future state of a company that is to be achieved over the long term. The vision is usually formulated in one or two sentences and is intended to create an inspiring effect. For instance, Walmart, a U.S retailer, has the following vision: “to become the worldwide leader in retailing”. Microsoft provides another prime example, saying “a personal computer in every home running Microsoft software” is its vision. A **strategy** describes how this vision can be realised and thus serves as a guideline for daily operations. When formulating a strategy, the company will derive several things, including strategic objectives that are in line with the vision (see Welge et al., 2017, p. 251). Possible strategic objectives include, for example, a specific annual growth rate for revenue, a targeted market share or the number of new product developments over a specified period of time. The **business model** is a concept that provides a simplified depiction of a company’s business activities. A business model is thus an abstract illustration of how a company fundamentally operates in order to achieve its defined strategic objectives. There are meanwhile many approaches for depicting business models. This Dream Car report uses the St. Galler Business Model Navigator, which is also the basis for the Business Model Canvas, a template that is widely used in practice for developing a business model.

The St. Galler Business Model Navigator, which was developed at the University of St. Gallen, is a widely used approach to describing business models. Overall, the St. Galler Business Model Navigator is based on **four significant components of a business model**: customers (who?), value proposition (what?), value chain (how?) and revenue model (value) (see Figure 2).

**Vision –
strategy –
business model**

**St. Galler
Business Model
Navigator:
Four significant
components of a
business model**

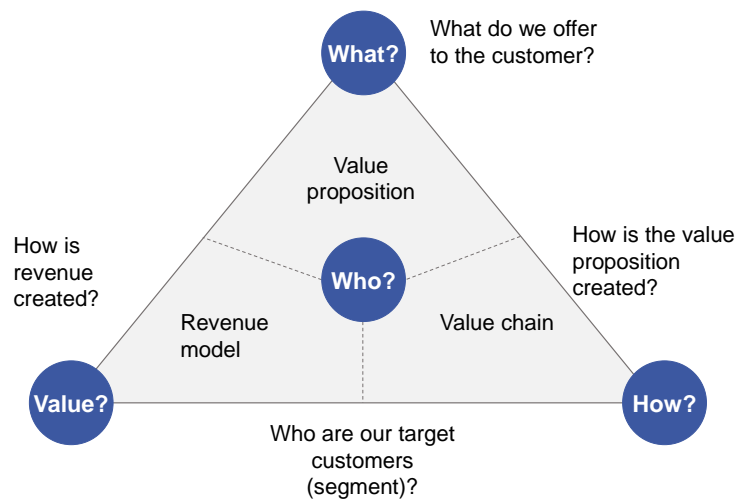


Figure 2: St. Galler Business Model Navigator (see Gassmann et al. 2013, p. 6)

This tool describes companies' business models using these four business model components, which are closely related. These components reflect the fact that business models are fundamentally not rigid, rather they change constantly. In other words, companies must continuously enhance their business models in order to stay competitive. Factors that might prompt a company to enhance or update a business model include, for example, changes within one of the four business model components (see Osterwalder/Pigneur 2011, p. 142f.). If such changes occur, they also often lead to further changes within the other business model components. When changes are made to at least two components of a business model, Gassmann et al. (2013) refer to **"business model innovations"** (see Gassmann et al. 2013, p. 7). If these changes are driven by the use of digital technologies (e.g. high-performance computers, broadband Internet, apps on smartphones, etc.), they are called **"digital business model innovations"**. The next section of this report provides several application examples which illustrate how the use of digital technologies can result in fundamental change in the individual business model components.

- **Business model component – "Customers" (who?)**

Customers are the focal point of business models. Specifically, the focus is on the customer groups (e.g. B2C or B2B) which the company is targeting. In this context, business models also define how these customer groups should be addressed and how customer relationships should be structured. The company **Mister Spex** has become one of Europe's largest online opticians by using digital technologies. Its business is based on a customer relationship in which, in contrast to "conventional opticians", glasses are sold without personal customer contact. For example, customers can upload their image to Mister Spex's homepage and "try on" glasses online. In order to handle services that cannot be carried out online (e.g. eye tests), however, Mister Spex cooperates with numerous local opticians.

**Mister Spex:
Selling glasses
without personal
customer contact**

- **Business model component – “Value proposition” (what?)**
The “value proposition” component of the business model covers the products and services which the company offers to its customers. The use of digital technologies makes it possible to replace physical products with their intangible counterparts. An example of this is MP3 technology and the associated offering of digital music. By launching iTunes, **Apple** has implemented a business model in which music is sold without data mediums (CDs, vinyl records, etc.). In exchange for a fee, customers download individual songs via iTunes to their iPhone or iPod. Apple’s approach has upended the music business and made it the world’s largest music retailer, without having sold even a single CD or vinyl record. In addition, Apple is continuously adapting its business model (for example, by offering its own music streaming service).
- **Business model component – “Value chain” (how?)**
The business model component “value chain” includes all activities, processes and key resources needed to render performance, i.e. to implement the business model. In order to obtain access to key resources that they do not have inhouse, companies often agree to strategic partnerships with other companies or invest in start-ups. For example, Daimler AG and Europcar partnered to establish **car2go** in order to enter the free-floating, car-sharing business. The entire process to rent a car is therefore realised via several digital technologies. This means, for instance, that the customer’s smartphone must be seen as a central interface that serves as a device for information, booking and payment purposes.
- **Business model component – “Revenue model” (value?)**
The revenue model describes the financial aspects of the business model. It contains not only the cost structure but also the sources of income. Digital technologies can be used in particular to implement new concepts regarding sources of income. For example, **Rolls Royce** (a manufacturer of turbines for civil and defence aviation) has introduced the “pay-per-use” concept. Under this approach, customers pay a fee for every hour the turbine is used, instead of actually buying the turbine itself. In order to offer such a concept, Rolls Royce uses sensors to record the turbine’s operating data, which are then collected centrally and analysed.

Apple:
Selling music
without sound
carriers

car2go:
Using the
smartphone as
an interface to
rent a car

Rolls Royce:
Applying
“pay-per-use”
as a payment
principle

In order to differentiate business model innovations based on their degree of change, a distinction is made between **incremental and disruptive business model innovations** (see Mezger/Bader 2014, p. 240). Incremental business model innovations result in relatively limited changes to the business model. Disruptive business model innovations, on the other hand, lead to the emergence of new and previously unknown business models (see Schallmo 2013, p. 25).

2.2 Framework for classifying digital business model innovations

Different possibilities exist in both literature and actual practice to classify **digital business model innovations** in the overall context of business model innovations. The following section of this report proposes the use of a six-field matrix to classify potential business model adaptations resulting from the use of digital technologies (see Figure 3). The six fields are described in terms of **organisational forms** and **performance categories**. The organisational form distinguishes between business model innovations with and without new organisational forms. The performance category is broken down into platforms, individualisation and expansion, as well as internal optimisation.

Structuring of digital business model innovations

		Performance category		
		Platforms	Individualisation and expansion	Internal optimisation
Organisational form	Without new organisational form	App Store (Apple)	Intelligent lifts → preventive maintenance (ThyssenKrupp)	Data-based optimisation of milk runs (Wittenstein)
	With new organisational form	Axoom (Trumpf)	Video-on-demand Maxdome (ProSiebenSat.1 Media)	Data Science department (Daimler)

Callouts:

- Perfectly fitting smart services / products (points to the Platforms cell)
- All types of internal improvements (points to the Internal optimisation cell)
- Outsourcing, lab, partnership (points to the 'With new organisational form' row)

Figure 3: Structuring of business model innovations

The individual performance categories are explained below. The relevant framework conditions for the versions with and without new organisational forms are presented and illustrated with examples.

(1) Platforms

Platforms, also known as digital platforms, are found in a growing number of industries. Their introduction frequently triggers a fundamental transformation of the industry and competitive structure (see Baums et al. 2015). They are seen as **central drivers of innovation**. As a result, they play a significant role in the economic development of the respective industry and exert a growing influence on the structure of the competitive environment (see BMWi 2017, p. 14). Rapid and fundamental change in industries is attributed to digital platforms, as prominent examples such as Airbnb, Amazon and Kickstarter demonstrate. The Gartner Hype Cycle for Emerging Technologies of 2016 also states that digital platforms and the related technologies are a key trend (see Gartner Inc. 2016). For example, the leading digital platforms occasionally generate more revenue than the most important German DAX groups. Their growth rates are also often significantly higher than those of industrial companies without platform-based business models. As a result, their profit margins expand rapidly and steadily (see BMWi 2017, p. 21). Managers of companies that do not have a platform-based business model are

Digital platforms profoundly change industries

increasingly recognising the importance of digital platforms. 40% of companies surveyed in a recent study indicated that having their own digital platform and participating in digital platforms will be a crucial factor for their success in the future (see Accenture 2016, p. 5). Their objectives are, first, to participate in successful platforms, and second, to establish their own. When digital platforms become a part of the competitive landscape, this leads to **fundamental changes in the basic structures and mechanisms of the affected industry**. As a result, a new type of competition and value-add emerges. This change threatens the value-add generated by companies that do not have platform-based business models, and accordingly endangers their competitiveness (see Choudary 2015, p. 329). Figure 4 depicts the basic structure of a digital platform and its mechanisms.

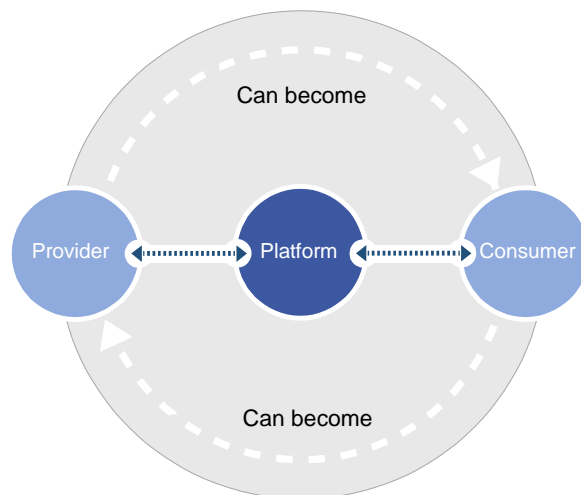


Figure 4: Digital platforms (based on Seiter et al. 2017)

The digital platform acts as an intermediary between providers and consumers, enabling interactions between them that result in both direct and indirect network effects. In addition, both suppliers and consumers can switch their roles on a digital platform – a provider can also be a consumer and vice versa.

The organisational form of the platform operator can vary. Digital platforms can be established within an existing organisation or established in the market as a new organisational form. **Platforms without new organisational form** means an existing company establishes the platform and the associated services as its new, digitised business model. Apple created such a novelty when it launched the iPhone and the associated App Store in 2008. The App Store as a sales platform was built into the existing organisation and primarily offered mobile apps for the iPhone. Apple, which started as a proprietary system, opened itself for the first time for external developers when it launched the App Store. Today, the requirements for inclusion in the App Store remain very high, which is reflected in the fact that every new developer and each new app are explicitly reviewed. Apple's selection process is often criticised for its lack of transparency. Meanwhile, however, there are now over 2 million apps available to address the needs of both existing and new customers. Customers can use the specific services that they want. Apple was able to revolutionise the prevailing mobile communications market and displace the existing companies.

In the future, platforms will be crucial for company success

Apple's App Store revolutionised the mobile communications market

Trumpf subsidiary Axoom supports companies with the digitisation of their business processes

Platforms with a new organisational form are platforms that operate as a separate entity. That means they can arise, for example, as start-ups or through a spin-off. They are therefore present in the market as largely independent intermediaries or operators. As digital platforms can be successful only if they scale up quickly, such spin-offs can weaken the direct link to the founding company. This weakening, in turn, might alleviate inhibitions that rivals competing in the market against the platform operator may have about joining the platform. In that way it will promote the entry of all players in the market and thus foster the scaling effect. One example in the category of platforms with a new organisational form is Axoom, a subsidiary of the Trumpf Group. Axoom aims to support manufacturing companies in their journey towards Industry 4.0. Axoom can vertically connect machines and systems with all components and sensors and thus create a consistent horizontal database. The data can be queried and analysed in real time, making predictive maintenance possible, for example. Networking thus provides users with better management of their customers, products, services and innovations.

(2) Individualisation and expansion

The term individualisation summarises the growing trend towards individual customer solutions and the possibility of realising an economic lot size of 1. Individualisation in the context of digital business models therefore focuses on the development of customised products and services. The customer's preferences are frequently oriented not just to the product alone, rather towards a customer-specific combination of smart products and smart services.

Digitisation enables access to new market segments

Existing production strategies are frequently not able to handle individualisation and expansion. The efficient division of labour in the production chain makes it advantageous to realise individualisation and expansion as late as possible in the production process. In other words, mass production continues at the beginning of the production chain, and the resulting products are individualised with increasing customer proximity. Modular strategies are used in this regard. Customers can adjust and individualise their products late in the production process using configurators. Another popular approach is to expand the focus so that it includes not only pure production-technical changes, but also services, and then to build up the products to accommodate these services. Companies face a trade-off between individualisation and the associated adjustment costs in the process to create products and services. However, there are hardly any limits to this individualisation if the products, processes and services are digitised. The new forms of networking can involve customers to a greater extent in the development and performance-creation processes (e.g., product configurators) and significantly increase the product's benefits. The implementation of these new opportunities through digitisation enables a comprehensive differentiation in the market and can lead directly to business model innovations. This makes it possible to reach market segments that were not accessible via the previous standard offerings.

Smart services and smart products that can be integrated into the existing core business enable an **individualisation and expansion** of products and services **without new organisational forms**. This can improve the process to render services and allow adaptation to individual customer requirements. ThyssenKrupp, for example, equips its lifts with sensors. It collects operating data continuously and can therefore control all of the lift's functions. Based on this foundation of data, machine learning made it possible to develop a completely new preventative maintenance system. Previously the company responded to a problem. Going forward, service technicians will have real-time data available and can therefore initiate appropriate measures before a lift fails. Individual services can therefore be offered depending on the customer and usage. That way the respective customer will be served according to their needs. The expansion of performance at Porsche AG will enable future customers via download to receive more horsepower, new suspension tuning or individual lighting. In addition, there is also the Mark Webber function, which involves installing an app which enables the car to automatically follow Mark Webber's ideal racing line on a racetrack.

ThyssenKrupp expands its lifts to include sensor-based preventive maintenance systems

An example of **individualised services** rendered via a **new organisational form** is Maxdome, ProSiebenSat.1 Media's video-on-demand service. The core business of ProSiebenSat.1 Media is the operation of traditional television stations such as ProSieben, Sat. 1 or kable eins. Digitisation created the possibility of offering videos online on demand, thus creating the impetus for a new business model. Using a new organisational form, the resulting business is therefore operated as the subsidiary Maxdome GmbH. Maxdome is a fee-based video-on-demand provider that makes available the content of ProSiebenSat.1 Media at any time. Moreover, it provides access to additional, also exclusive, series and films. Overall, this results in content containing over 50,000 items that can be retrieved at any time. Customers can thus customise and retrieve their programme as needed.

(3) Internal optimisation

The following section covers all types of internal improvements in the context of digital business model innovations and the performance category of internal optimisation. Internal optimisations can be achieved in particular through the improved use of data and the knowledge gained from it.

Regarding the organisation of companies, it is important to distinguish between the organisational structure and the operational organisation. Data-driven improvements without a new organisational form in internal processes result in an improvement of the operational organisation. The operational organisation is thus geared to the internal distribution of work and processes, which are often summarised under the catchword Industry 4.0. The use of sensors or the Internet of Things creates intelligent and digitally networked systems, which connect production with information and communication technology. This connectivity is expected to boost efficiency by up to 30% (see Gneuss 2014, p. 3).

Industry 4.0: Digitisation in the operational organisation

The term organisational structure describes the hierarchy of an organisation and the distribution of tasks. Changes in the organisational structure are based on the integration of the requirements of digitisation into the existing organisation. These can be carried out efficiently only if an **organisation responds with suitable measures and changes**. For example, the organisation must be adapted in order to make use of the increased volume of available data as a result of digitisation. Gaining knowledge from data requires an extensive and know-how-intensive process, beginning with the identification of data-related business problems and extending to the derivation and implementation of recommended actions. This business analytics process covers various sub-aspects, such as data acquisition, -retention, -preparation and -analysis, as well as visualisation, reporting, integration, privacy and security. At the moment many companies have limited expertise in business analytics. In addition, best practices frequently do not exist regarding the introduction and implementation of a business analytics function. Depending on the organisational form and the business problems, there are different ways to introduce and propagate business analytics. For example, companies must distinguish between a decentralised approach and the centre of excellence (see Figure 5). A decentralised approach means that several business analytics units exist in different places in the company, and these units are not subordinate to a coordinating unit. If decentralised units are made subordinate to a centre of excellence, this raises the level of centralisation and the coordination effort increases. The centre of excellence is directly subordinate to the first level of management. It sets the standards for each of the business analytics roles, defines communication, and ensures training.

Pent-up demand for business analytics know-how

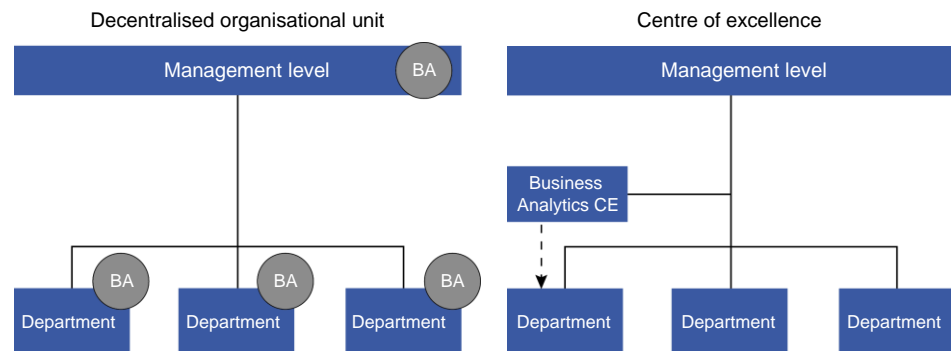


Figure 5: Organisational options for business analytics

An example from Daimler AG illustrates the practical application of an **internal optimisation with new organisational form**. Business analytics and Big Data are one of executive management's priorities at Daimler AG. The group therefore established a centre of excellence. Developments such as autonomous driving and the growing use of sensors in internal production processes are rapidly increasing the number of data sources. The centre of excellence used Hadoop and SPSS to develop a reference architecture for application scenarios and shared services. The individual departments can then access this architecture. So far, the centre of excellence has used this reference architecture to support all of Europe, providing solutions for business areas which, in turn, can focus on their implementation. The goal is to support the

Centre of excellence for the centralised development of innovative solutions

regional markets with complete solutions in the form of templates. The targeted next step is to expand the structures to China (see Lampe 2015, p. 6ff.).

If existing processes are to be optimised, an **internal optimisation without new organisational form** is appropriate. A case study from Wittenstein SE describes this approach. The specific case in question involves the optimisation of “milk-runs” in production. A milk-run is based on the historical principle of a milk delivery. A milk man drives a specified delivery route at fixed times. A new bottle of milk is provided if an old, empty bottle is made available for pick-up. Similar to this principle, an employee from intralogistics at Wittenstein rode through the factory every hour. As the company until then had been capturing only limited amounts of data, it had no feedback about which production orders were in what status at which location, and whether a pick-up area was empty. A digital depiction of the material flow created an intelligent material supply in the factory, enabling the timing of the trips to be optimised. This resulted in a reduction in the number of trips. In addition, resources could be saved and the capacity of the employee was made available for other responsibilities.

2.3 Success factors of business model innovations

The foregoing can be **summarised** in two points:

- The business model describes who the customers are, which products are offered in the market, how their value chain is created and, last but not least, which approaches are used to generate revenues. The company's business model is part of its strategy.
- Digitisation is forcing all companies to rethink and digitise their business models from scratch. A wide variety of company-specific design options are available to do that. In addition, one further point should be emphasised, namely that digitisation is not an end in itself, rather the vehicle for success in the market to ensure the company's future viability.

In view of the large variety of digital business models, this raises the question about the factors which represent the key to market success. A large-scale empirical study (see Kavadias et al., 2017) has shown that six success factors are relevant:

- personalised instead of standardised products or services
- a closed value cycle, in which products can be recycled, instead of a linear value chain
- joint use of investments
- usage-based prices instead of fixed prices
- network-based value creation
- agile organisation

Six factors for a successful digital business model

The study indicated that the companies which were particularly successful in practice were those which realised in a digital manner **at least three of the six success factors**.

Digitisation is therefore today an indispensable enabler for realising market success.

3 Controllers as business partners when developing/implementing digital business model innovations

3.1 Corporate strategy is the starting point

Today’s “digitisation strategy” does not just offer opportunities for companies, it also harbours risks. The objective here is to exploit the opportunities while not underestimating the risks. One of the primary dangers is that an actionist and uncoordinated approach will lead to a “digital patchwork” in the development of a digital business model. Here the controller’s main task is to ensure that the business model is developed in a coordinated process that objectively balances opportunities and risks.

Avoid the digital “patchwork”

A proven approach is to **embed the development of a digital business model into a digitisation strategy**, which, in turn, is derived from the corporate strategy. This is a way to design an integrated, digital strategy process that includes the same components as the corporate strategy. Figure 6 shows the overall structure of this process, with its focus on the digital business model.

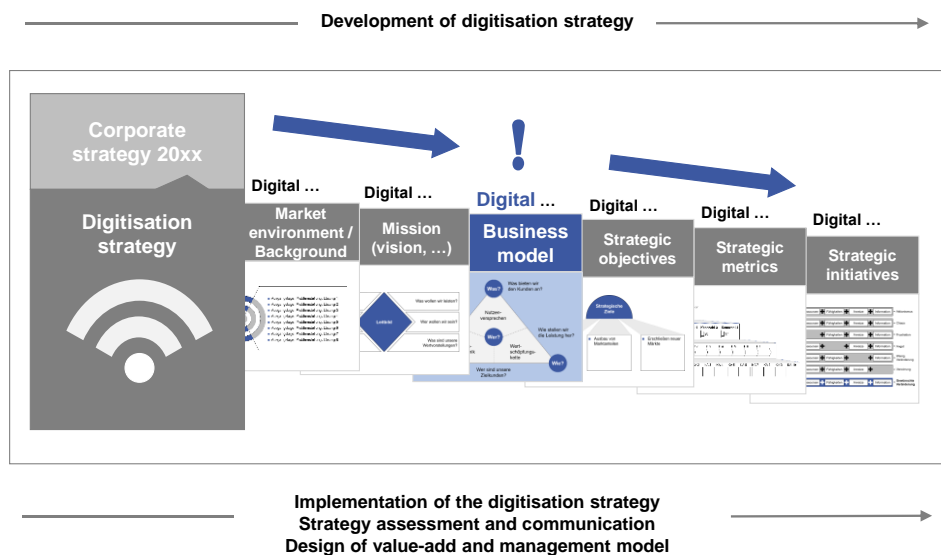


Figure 6: The digital business model as part of the digital strategy (based on Greiner et al. 2017, p. 22).

It is important to emphasise that prior to the development of a digital business model, the company must analyse the market environment and the company’s internal starting point (digitisation-oriented maturity analysis).

Digitisation-oriented maturity analysis is the first step

The company then derives from the digital business model its implementation objectives, KPIs and specific initiatives. This must be one of the controller’s responsibilities in the project team.

3.2 Phases of digital business model innovations

The changes to existing business models, or the creation of new ones, can be broken down into the traditional phases of innovation processes, specifically (1) brainstorming, (2) assessing ideas, (3) implementation and (4) ongoing operations. However, the traditional breakdown should not hide the fact that this process rarely proceeds in a linear, planned manner. Instead, the process to create digital business models is **subject to uncertainty and dynamics**, and requires an **agile, iterative approach** with the courage to try “controlled” trial-and-error and modified controlling tools. The questions for controllers include

Questions for the controller

- which controlling processes are impacted in the individual phases;
- which (new) tasks are involved;
- which tools and instruments are suitable for fulfilling the tasks; and
- which skills are needed and what role can the controller play.

(1) Brainstorming

The brainstorming process is not a single, enclosed activity, rather a permanent screening of the market and the competition aimed at developing an early awareness of new business models and potential opportunities and risks (see Figure 7). In a reactive sense, this involves recognising new business models that have established themselves in the market and which might threaten the company’s own business model. In a proactive sense, this involves **recognising potential**. It is specifically this phase that demands from controllers a strong market and strategy orientation, openness for change, and imagination as well as creative will, i.e. an expansion of the traditional business-case thinking.

Ongoing monitoring of the competition needed

Impacted IGC processes	Tasks	Tasks of the controller	Tools	Change
Strategic corporate planning, risk controlling	Market and competitive screening	Discover competitive and start-up activities, recognise new business models	Traditional tools for early recognition, digital screening in the web	Stronger market and strategy orientation of the controller
	Business model monitoring	Observe the development of new business models, assess the strengths and weaknesses compared with existing business models	Similar to above, plus business analyses and strategic tools (SWOT)	Broader focus, not just on main competitors, but also on start-ups and other industries
	Identification of potential business model innovations	Recognise the transferability of business models	Typical creativity techniques (synectics, morphological box, etc.), high-level business analysis, high-level risk check	Faster analysis cycles, proactive focus by the controller on strategy, stronger creative will

Figure 7: Brainstorming

(2) Assessing ideas

An initial rough evaluation and pre-selection of the ideas already occurs in phase 1 in the steps “Business model monitoring” and “Identification of potential business model innovations”. Building on this, phase 2 involves analysing in more detail the pros and cons, risk and success factors, and financing requirements, as well as the potential business and strategic effects of possible business model innovations (see Figure 8). The high uncertainty and dynamics of digital business models (e.g. legal uncertainty at Uber and Airbnb, capacity requirements in IT and logistics with product-trading business models) make it necessary to focus primarily on recognising the success and risk factors and playing through different scenarios, and less on the specific business case. The ideas are **evaluated not solely based on financial criteria, rather several dimensions are involved**. In line with the uncertainty and dynamics, many companies are also beginning to develop business cases incrementally and to approve defined budgets (micro investments) from phase to phase. That way they can evaluate them again at a later date. Assessing ideas requires that controllers become more deeply involved with the success and risk factors, think in terms of changing scenarios, and make constant reassessments, rather than a one-time, accurate calculation. In addition, the controller is confronted with an evolving state of knowledge as the evaluation process progresses. This makes it more difficult to create an evaluation model and play the role of a sparring partner.

Dynamics of digital business models change the controller’s work

Impacted IGC processes	Tasks	Tasks of the controller	Tools	Change
Strategic corporate planning, business partnering, investment controlling, risk controlling, data management	Business model formation	Define the evaluation process, define the business assessment criteria, identify the fundamental success and risk factors, derive the necessary information	Methods to assess strategy, investment accounting, risk assessment, scoring models, simulation, scope planning, value driver models, idea evaluation tools, tools of innovation controlling	Broader model development and evaluation dimensions than in traditional business cases, explicit consideration of dynamics and uncertainty, stronger qualitative assessment, gradual improvement of the information basis
	Information collection and assessment	Participate in the determination of relevant information, verify the plausibility of the information’s quality	Gathering external information, providing information internally	Stronger use of external information as well as non-industry and unstructured data
	Idea evaluation	Determine the potential consequences for the existing business model, the financing need and the profitability based on the selected model, analyse the sensitivities and risk factors	Financial planning, sensitivity analysis, scenario techniques, decision trees, what-if analyses, simulation	Stronger consideration of uncertainty and qualitative factors, taking into account the possibility of failure and the resulting necessary alternatives
	Decision preparation	Participate in the development of objective and professional decision-support documentation, comment	Structure of standardised reports (e.g. idea cockpit) and presentation documents	-
	Rationality validation	Business counterpart in the decision-making process	-	Greater uncertainty and thus higher requirements placed on controllers in their role as a sparring partner

Figure 8: Assessing ideas

(3) Implementation

The implementation phase must distinguish between the sub-phases of **planning and preparation, and actual implementation**. The planning phase involves determining clear objectives and priorities without detailed project plans (see Figure 9). Symbolically, Amazon's motto can be used to depict this: "stubborn in the vision, flexible in the implementation". To that end several factors are defined to enable rapid and controlled reactions, including milestones, continuation or termination conditions (gates) and high-level alternative plans. The preferred methods for the implementation are agile ones, such as SCRUM, which allow fast, flexible yet controlled implementation, rather than the traditionally rigid methods of project management. This means controllers will not have a detailed overall project plan available, and instead must refer to rough overall goals and milestones with short-term, dynamically created milestone plans. This requires controllers to be involved operationally, to meet shorter reporting cycles for faster control, and to recognise that forecasts have become more important. In line with the greater uncertainty and possibility of failure, controllers must attentively fulfil their role as a business conscience, take action if there are no prospects for success, and oppose the typical sunk-cost effect and the futile continuation of unsuccessful business models.

Focus on operational controlling elements

Impacted IGC processes	Tasks	Tasks of the controller	Tools	Change
Planning, budgeting and forecasting, project controlling, cost accounting, management reporting, business partnering	Planning	Create project plans, define continuation and termination criteria for certain milestones (gates)	Traditional methods of project planning (milestones, etc.) as well as newer, more agile methods such as SCRUM (see Chapter 3.3)	Less planning depth, greater flexibility
	Planning and budgeting	Integrate the project plan into the operational planning and budgeting	Modern budgeting	Less planning depth, alternatives (plan B) and ranges, new value drivers and modified cost and revenue structures
	Control	Monitor the implementation process	Progress controlling, KPIs for the "ramp-up phase" towards ongoing operations	Greater flexibility and uncertainty, stronger operational involvement, error-tolerant culture
	Forecasting	Create forecasts, identify expected variances, analyse the effects on the annual budget	Faster forecasts based on evaluation models	Greater flexibility and uncertainty, shorter reporting cycles
	Rationality validation	Support the implementation measures as a sparring partner, avoid the sunk-cost effect	Termination criteria, gates	Greater flexibility and uncertainty, error-tolerant culture

Figure 9: Implementation

(4) Ongoing operations

The ongoing operations phase involves successful planning and controlling of the business, i.e. the **traditional core tasks in controlling** (see Figure 10). Frequently, however, new business models involve different cost structures and revenue models, and thus new value drivers and key performance indicators (KPIs). This requires an enhancement of the controlling system and the integration of different business models into the overall management of the company. To achieve that, controllers must have some conceptual skills. Data management is particularly important for digital business models too. Once the new business model begins to operate, the need to screen the market for new developments also arises.

Enhancement of the controlling system

Impacted IGC processes	Tasks	Tasks of the controller	Tools	Change
Planning, budgeting and forecasting, cost accounting, management reporting, business partnering, data management, further development	Control the new business model on an ongoing basis, integrate the controlling of the new business model into the overall controlling of the company	Perform traditional controller tasks related to the new digital business model, and conduct portfolio controlling of old and new business models	Complete range of controlling tools, data from the digital value chain	New KPIs (non-financials, such as website KPIs), other value drivers, revenue models, modified cost structures and capital commitment, faster reporting cycles (near-time), Big Data and analytics available directly from the digital business processes

Figure 10: Ongoing operations

Role of the controller

The ideal image for the role of the controller as that of a sparring partner or business partner has become established in recent years. As part of this role, controllers have two very different tasks besides their basic activity of providing information. These two tasks are not always easy to combine. On the one hand, they are expected to actively support the pursuit of revenue and earnings growth and point out development opportunities. On the other hand, they are expected to be the conscience of the business and openly take a stand against potentially wrong decisions by management. The trade-off between the role as a supporter and driving force, on the one hand, and the role as a business conscience and “killjoy”, on the other, is particularly acute when strategic issues about the business model are involved. In view of the framework outlined above, it is important for controllers not to stick stubbornly to the traditional image of them as the spoilsport or bureaucratic business-case-preventer, without entirely abandoning the role of business conscience.

Trade-off between being “a killjoy” and a “driving force”

Questions concerning the business model and business model innovations are highly strategic in nature. That means the expectations of the controller’s role are those of the **strategic controller**. The IGC competence model (see IGC 2016, p. 124ff.) sets out that (strategic) controllers are expected to ensure that their companies have an efficient process to create business model innovations or develop strategies. When doing so, controllers support managers using their understanding of methods and tools, and their analytical skills. Controllers participate actively in the process of business model innovation and support the process by taking a business-oriented view. If ideas

are assessed positively, they ensure that clear goals and priorities are set to enable successful implementation. During the implementation they monitor the success and progress of the business model innovation and provide timely information if implementation problems occur or if changes appear in the strategic framework conditions on the market.

The aspects important for the controller’s role regarding digital business models include not only the strategic dimensions, but particularly the possibilities of digitisation. Controllers must use the possibilities of the digital value chain (Big Data, analytics) for controlling purposes and to meet the specific speed requirements of their business. They must additionally differentiate themselves from new occupational fields, such as the data scientist.

Skill set needed by controllers

The controller’s tasks and areas of activity cover **nearly all of the processes set out in the IGC controlling process model**. However, the processes that are particularly impacted include strategic planning, project and investment controlling, business partnering and the further development of the organisation, processes, tools and systems. For further information about the skills required, please refer to the skills defined as relevant for controllers in the IGC controller competence model (see IGC 2016, pp. 126f.). The skills listed there can be used to derive a specific skill set. The structure of the skill set can follow the IGC model. The following sample skill set serves as a starting point and must be adapted to the circumstances in the company for a specific controller position (see Figure 11).

Comprehensive skills are needed

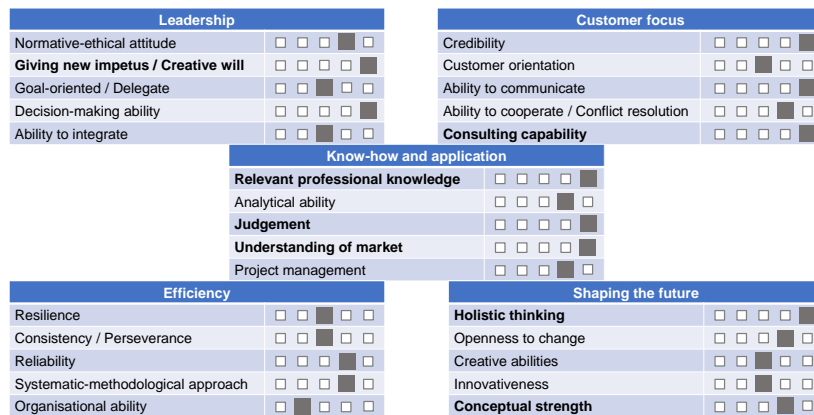


Figure 11: Key skills and the master skill set that controllers need to control business model innovations

Among the skills of the controller as shown here, relevant professional knowledge is particularly prominent. In addition to the standard knowledge of controllers, the following expertise is especially important for controlling digital business models:

- knowledge of the market, competition, technology and business
- strategy development
- new business models and their value drivers
- project management
- innovation processes

3.3 Overview of new innovation methods and tools

The controller’s direct and indirect environment is characterised by uncertainty, a fast pace and increasing digitisation. Digital business models and business model innovations are a key competitive advantage. In order for controllers to act as business partners in the development and implementation of digital business model innovations, they must develop and apply new tools to supplement conventional approaches and methods.

Increasing digitisation means new controlling tools are necessary

The following section outlines the new innovation tools that controllers can use when designing digital business model innovations.

The changes in the economic environment mean that **traditional approaches are frequently no longer suitable to meet the higher requirements**. Companies are therefore increasingly using new innovation tools. Start-ups began using these tools early on in order to respond to the uncertainty prevailing in their environment, such as the requirements resulting from technological changes or customers. The methods (1) Open Innovation, (2) Design Thinking, (3) Agile Approach and (4) Lean Start-up provide different approaches to support the various phases of the innovation process (see Figure 12). Design Thinking, for example, emphasises an understanding of the customer’s problems, whereas Lean Start-up focuses on solution experiments. These four methods are explained in more detail in the following section.

New methods to support the innovation process

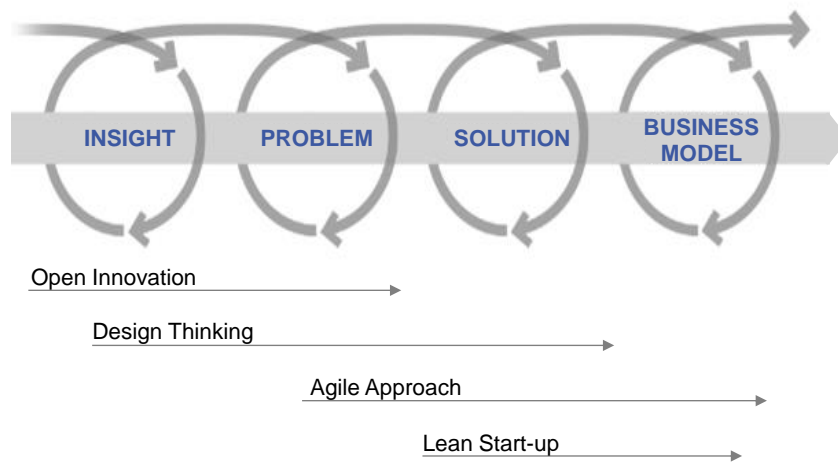


Figure 12: Innovation tools along the end-to-end innovation process (based on Furr/Dyer 2014)

Use of external resources and interaction

(1) Open Innovation

Companies applying the Open Innovation method use external ideas, solutions and technologies, instead of focusing exclusively on internal innovations. There are generally three different forms of Open Innovation, which vary in terms of the direction of their idea flows: outside-in, inside-out and coupled innovations.

In **outside-in**, the initiator of Open Innovation opens their organisation's boundaries to use external ideas and technologies. In return, the initiator of Open Innovation releases their own resources so that external parties can use them (**inside-out**). In this way unused innovations are made available to others. Both approaches can also be combined into a **coupled process**, in which organisations work in alliances that involve both giving and taking (see Hjalmarsson et. al. 2007).

Furthermore, a distinction can be made between different models of Open Innovation, including:

- crowdsourcing;
- product platforms;
- collaborative innovation networks; and
- innovation competitions.

Open Innovation can also change core cultural aspects in companies and create new types of intelligent, connected products, as well as new business models on platforms.

(2) Design Thinking

Iterative use-oriented approach to problem solving

The term Design Thinking refers to a collaborative and multi-disciplinary approach to creative problem solving and the development of innovative solution concepts. It focuses on the potential user and follows an approach based on design methods. In contrast to traditional methods, which are based on technical solvability as a starting point, the focal points of the process under Design Thinking are the user's desires and needs, and user-oriented innovation. Design Thinking can thus be used to **identify needs** which the user is not aware of and has therefore not yet articulated. An innovation results when the requirements "desirability", "viability" and "profitability" are met (see Figure 13).

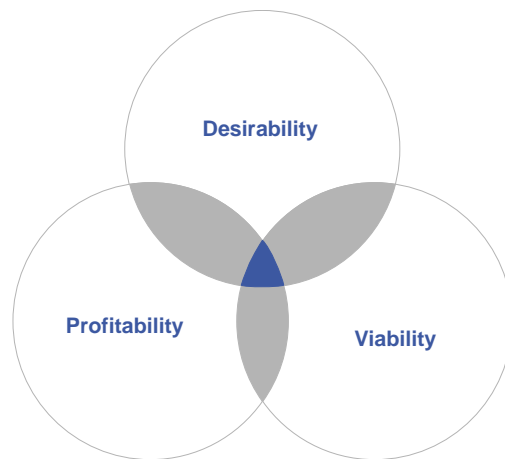


Figure 13: Innovation as the intersection of desirability, profitability and viability

Design Thinking uses methods and experiences from a wide variety of disciplines and promotes innovativeness primarily by

- using interdisciplinary teams with flat hierarchies;
- creating a flexible environment and maintaining a respectful and error-tolerant work culture;
- following a process that allows teams to shift their work mode between the phases of understanding the problem, brainstorming and solution validation.

The Design Thinking process is a highly iterative approach focused above all on understanding the actual problem in the best and most comprehensive manner possible before attempts are undertaken to find a solution (see the example of an ideal Design Thinking process in Figure 14). Under this approach, potential users **continuously test** the potential solutions using simple and easy-to-create prototypes. This helps to realise the necessary learning cycles in a rapid and cost-effective manner.

Iterative learning process through the direct implementation of the identified solutions



Figure 14: Design Thinking process

(3) Agile Approach

The Agile Approach method focuses on the **rapid and flexible implementation of solutions**. It is characterised by the high level of attention which the project team places on the scope, time, costs and quality of the solution, and its efforts to continuously prioritise and coordinate its activities in this regard. The ordering party or target customer is heavily involved in the creation of the solution. As a result, a characteristic of the Agile Approach method is its focus on the innovation to be developed and its acceptance by the user. Examples of techniques under the Agile Approach method include SCRUM or Extreme Programming.

The Agile Approach method follows several basic principles. The main principle is the iterative approach, which can lead to frequent feedback processes

at all levels. This results in short planning and development phases, followed by direct implementation. However, it also means that new or revised requirements can be defined during the course of the project. To that end it is important that objectives and guidelines are clearly defined. This also requires that the team members act independently. The teamwork is based on simple, clear rules and direct, efficient communication. This creates joint learning with continuous improvements, which ultimately can lead to innovative developments.

(4) Lean Start-up

The term Lean Start-up is based on the Lean Manufacturing concept developed by Taiichi Ohno and Shigeo Shingo for Toyota. Under this concept, the production throughput time was decreased significantly through just-in-time production, the reduction of batch sizes, and inventory control. The Lean Start-up method applies this concept to entrepreneurship. The method aims to shorten the development time of products by applying a combination of business experiments, iterative product versions and validated learning. The central hypothesis of the Lean Start-up method is that if start-up companies invest their time in products or services that are developed in an iterative manner in order to satisfy the needs of early customers, they can **reduce market risks** and **avoid overly expensive product launches and lost sales**.

Conclusion

The use of the aforementioned methods is becoming increasingly important in the age of digitisation. **Shorter product cycles** and **advancing globalisation** are leading to increasingly intense competitive pressure in nearly all industries. This has two significant effects regarding customers and the interface to customers. First, companies have much more information about their customers than before. This increased knowledge makes it possible to develop a better understanding about customers, their customer journey, their user experience, their preferences, etc. And second, customers' expectations are growing and, at the same time, it is becoming increasingly difficult to meet customers' needs. Meeting these needs requires innovative offerings based on new business models, which can revolutionise the prevailing industry logic or even create completely new markets.

Examples of such successful new models include the taxi service Uber, the social media platform Facebook and Airbnb, the world's largest broker of private accommodations. These business model innovations focus in particular on changes in the structure of the value chain or the value proposition for the customer. When developing new digital business models, applying the aforementioned innovation methods is crucial. Design-oriented approaches in interdisciplinary teams, together with a common understanding of a business model vocabulary, are important too. Methods that are particularly well suited to change value chain structures include the Lean Start-up, Open Innovation or Agile Approach methods, whereas methods such as Design Thinking **target the needs of the customer in particular** and thus are helpful for an

Transfer of lean manufacturing to the innovation process

Use of successful business models as a source of innovation

innovative value proposition. These approaches have the advantage that their focus is not just on internal company resources and industry knowledge, but that they concentrate on customers' problems and their solutions (see Kreutzer et. al. 2017).

Companies can also be more flexible in a volatile environment using innovation methods, and respond more quickly and effectively to customer needs. Accordingly, competitive advantages can be achieved. The aforementioned companies are often used as guides and inspirations, as they have been able to transform digital economic mechanisms into innovative business models and to actively exploit the opportunities arising from the digital transformation.

3.4 Controller's tasks and requirements

In summary, two different perspectives must be taken into account from the controlling perspective for the successful development and implementation of digital business model innovations. They include, first, that controlling acts as an enabler for the development and implementation of digital business model innovations, and second, that digital business model innovations should be seen as drivers for the adaptation of controlling tools and methods (see Figure 15).

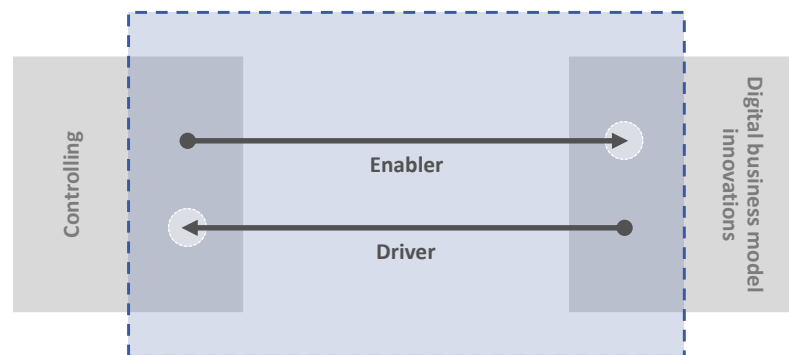


Figure 15: Relationship between controlling and digital business model innovations

Co-designing the innovation process

In terms of the **first perspective**, the controller assumes co-responsibility for the design of the process to develop digital business model innovations and to determine the associated commercial benefit. In order to have a say in this effort, controllers must not only enhance their understanding of the business and market, they must also be familiar with new innovation methods and tools (e.g. Open Innovation or Design Thinking). The expanded understanding of the market and business must also take into account, for example, that non-industry companies must be treated as potential competitors. This is important because competitive rules can change fundamentally within a very short time, particularly in the age of digitisation (see introductory company examples from chapter 1).

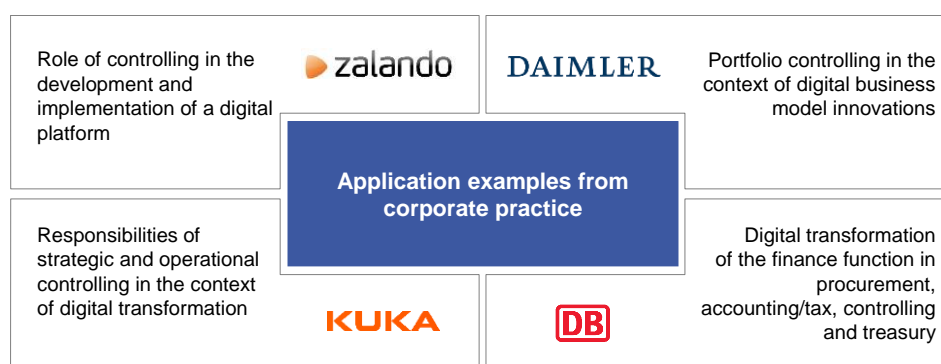
Implementing new controlling concepts

In terms of the **second perspective**, digital business model innovations place continuous demands on the controller and controlling with regard to the right controlling contents and the development of new controlling concepts. In this context, it is particularly important to derive new KPIs that are suitable for the business models to be implemented. In addition, the aforementioned dynamics and speed of market changes make it necessary to implement approaches in considerably faster cycles and to take account of limited resources. Traditional controlling approaches frequently come up short in this regard and require far too much time for design and implementation.

Only when they take into account both perspectives and thus perform the associated new tasks and fulfil the new requirements can controllers act comprehensively as management's business partner in the development and implementation of digital business model innovations.

4 Application examples from corporate practice

A view to actual corporate practice shows that today controllers are already intensively involved in the implementation of digital business model innovations. When doing so, controllers perform different responsibilities in this digital transformation. We would like to illustrate this by using four specific examples from actual corporate practice (see Figure 16).



**A view to
controlling
in practice**

Figure 16: Application examples from corporate practice

The **first application example** describes how controllers at Zalando participate in the development and implementation of a digital platform. Their participation involves carrying out different tasks in the overall innovation process, covering the phases of brainstorming, assessing ideas, implementation and ongoing operations.

The **second application example** covers the newly founded CASE organisational unit of the Mercedes-Benz Cars business area at Daimler AG. This organisational unit deals with digital business model innovations in the automotive industry. The application example shows the tasks performed by portfolio controlling in the CASE organisational unit.

The **third application example** explains the digital transformation process at KUKA, a manufacturer of robots, and the newly established Industry 4.0 matrix function that was created for this purpose. This explanation also covers “Connyun”, the Internet of Things platform which KUKA uses to build up its portfolio of products and solutions. Specifically, controlling’s tasks in the context of digital transformation are dealt with here.

In the **fourth application example**, the focus is then on the digital transformation of controlling itself. It explains how comprehensive digitisation is changing the finance function of Deutsche Bahn. This explanation covers the primary areas of activity and describes the relevant changes.

4.1 Digital business model innovations at Zalando

Authors: Dr Jörg Engelbergs (Vice President Controlling)
Paulina Issmer (Senior Finance Controller Advertising Business)

Overview of Zalando's platform

Zalando SE, which was founded in 2008 in Berlin, is **Europe's leading online platform for fashion**. In that capacity it connects customers, brands and partners across the value chain.

The centrepiece of Zalando's business, the Fashion Store, offers its customers a wide range of clothing, shoes and accessories from around 2,000 brands. By offering free delivery and returns as well as a 100-day right of return, Zalando set new standards in online retailing.

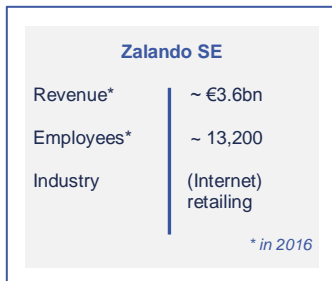
Today the group operates in 15 European markets, where it offers its customers over 20 local payment options, works with various regional logistics service providers and speaks 12 languages, not only in the online shop but also in customer service.

With the increasing number of customers, the demands on logistics and technology have grown too. Zalando has expanded its international logistics network in order to better meet the diverse needs of its ever-growing customer base. What began with a warehouse in the basement of the offices, today comprises a network of five logistics centres in Germany, as well as international locations in France, Italy, Poland and Sweden.

Innovative and inspiring technologies have made a significant contribution to the success of the company. In recent years Zalando has recruited around 1,900 technical experts from throughout the world. The curiosity and start-up spirit of the first days are still in the foreground at Zalando, despite the enormous size the company has meanwhile attained. In the innovation lab or during hackweeks, employees have the opportunity to implement their ideas outside the daily work environment and to test new technologies.

The strategic orientation towards the platform has also changed the understanding of who a Zalando customer is. Zalando has evolved from being a pure fashion retailer to becoming an online platform, or rather an operating system for the fashion world. Today Zalando connects all of the players in the fashion industry in a variety of ways and with a variety of services – starting from the end customer and extending to retailers, brands, stylists, factories and advertisers.

In recent years Zalando has invested in expanding and optimising its marketing capabilities. The total expertise and scope of Zalando, with over **22 million active customers** and **more than 200 million visits**, is bundled in Zalando Media Solutions, which provides personalised marketing services for brand partners.



Transformation of a fashion retailer into an operating system for the fashion world

Business model of Zalando Media Solutions

Zalando Media Solutions (ZMS) provides advertising services to fashion brands, develops advertising campaigns and implements them on both Zalando's own websites and on third-party websites. In addition, it obtains data that are used for targeted marketing. ZMS, as a portion of Zalando's platform strategy, also monetises the value of the platform in those cases in which visitors to the online shop do not yet buy something from the retailer (see Figure 17).

ZMS as an advertising service provider for Zalando and third parties

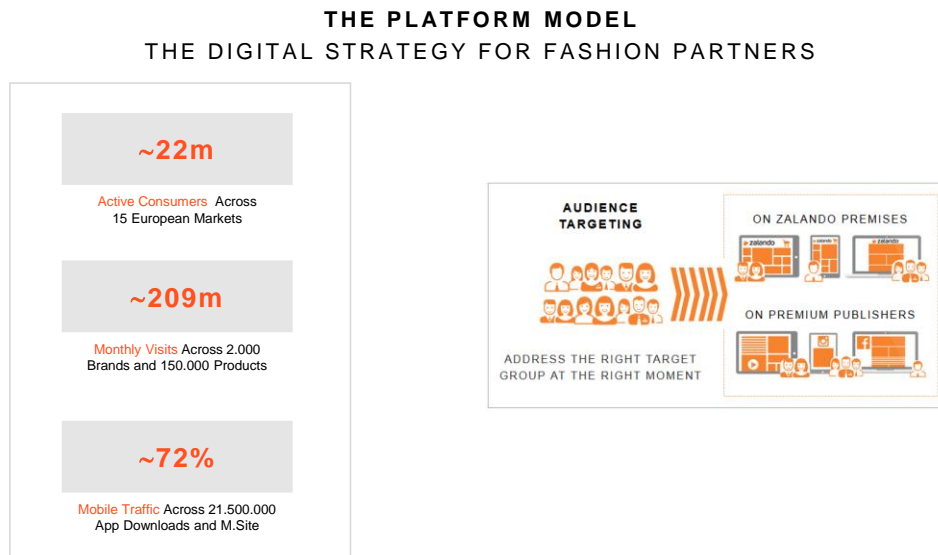


Figure 17: ZMS as a portion of the platform strategy

Today ZMS is mainly active as a media marketer and in the data business. In its capacity as a media marketer, ZMS develops advertising formats for brand partners for use on both Zalando's own websites and on third-party sites. When doing so, it addresses users with targeted advertising. It uses the technology of **Nugg.Ad GmbH**, a subsidiary, to aggregate user data in the 15 markets where Zalando operates as a retailer. ZMS analyses anonymised profiles and customers' behaviour on Zalando's own pages and uses the data for targeting and retargeting. In addition, ZMS in 2017 launched Collabary, a new product solution that enables it to operate in influencer marketing.

Implementation of ZMS in the digital platform

The implementation of the digital business model innovation along the innovation process is presented in the following section (see Figure 18). This includes reviewing the introduction of the controlling system, starting from the **strategic direction** through **to ongoing operations**, and the associated embedding in financial controlling.

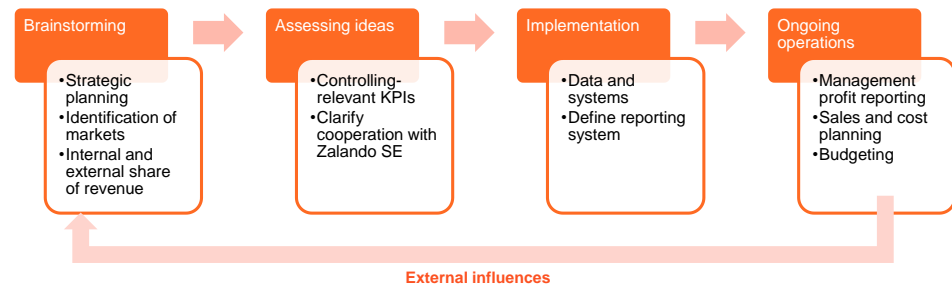


Figure 18: Innovation process for a digital business model at Zalando

Two companies provide the legal framework for the advertising platform: Zalando Media Solutions GmbH, a newly founded company, and Nugg.Ad GmbH, which was acquired for the entry into the new market. From a group perspective, they are bundled in an advertising segment, which draws on the resources, customer activities and know-how of Zalando. In addition, the group's high brand awareness facilitates the recruitment of qualified personnel. These synergies reinforce the rapid growth of the new digital business area.

Brainstorming

The starting point of the innovation was strategic planning, in which management partnered with controlling, particularly regarding comparisons with competitors, to develop a concept of how to monetise the advertising business, to determine which markets should be developed when doing so, and what revenue growth would likely result.

Market observations and analyses of Zalando's own competitive advantages and strategic gaps were then used to distinguish and define the following digital products as part of the brainstorming process:

ZMS's digital products

- onsite advertising with Zalando's advertising inventory
- offsite advertising for advertising measures on external sites (e.g. Facebook)
- incremental business based on Zalando data
- incremental business using external data

As the initiative involved a complementary business model innovation to Zalando's platform, one particularly important aspect was how **synergies can be leveraged to the greatest extent possible**. The group therefore defined, for example, how much of the internal Zalando inventory¹ should be made available for advertising purposes in order to grow the company's external advertising revenues as fast as possible. In addition, it also prioritised the markets to be developed.

Using the identified digital products, ZMS finally established a multi-year plan with corresponding revenue expectations. As this planning was value-oriented, it was also underpinned with cost estimates. The objective was to introduce an early-warning system already at this stage in order to control the business in a value-oriented manner.

¹ Inventory in this context refers to the impressions resulting when customers call up websites.

Assessing ideas

After defining the strategic business direction, financial controlling, together with management, structured the business idea further in order to be able to assess the added value in a continuous and targeted manner. This involved:

- defining **controlling-relevant KPIs**. These KPIs are used in the fast-paced digital business to identify business developments at an early stage in order, if needed, to introduce new innovations to the market or to scrutinise the respective product performance.
- establishing **contribution margin accounting per product**. The contribution margin accounting supports management with investment and operating business decisions.
- establishing **financial processes** for intercompany relationships. These are a fundamental building block for allocating the value chain between Zalando SE and ZMS, and the associated use of resources. The arrangements were documented in intercompany service agreements.

In order to assess the added value of the new business model, it was critical to specify the scope of the cooperation. To that end controlling developed several considerations, including the following aspects:

- internal and external service charging and performance logic
- structure of the logic for internal service charging in accordance with OECD transfer price guidelines (arm's length principles) for onsite, offsite and data business
- share of new and existing advertising business on the Zalando site
- resource use, particularly regarding Zalando's technological developments

The cooperation defined between Zalando and ZMS set the framework and the requirements for the financial data to be provided and thus the operational controlling metrics. These, in turn, provided the foundation for the structure of the corresponding reports to be prepared by the controllers.

Implementation

The focus in the implementation phase was on capturing and structuring data. Controlling's primary responsibility in this context was the validation of the data quality, starting when they were recorded in the accounting systems and then with sales.

In this regard, well-known financial and controlling models can generally be easily applied from other business models to digital ones. It is advantageous that a traditional inventory management system is not necessary in a digital business. In the case of ZMS, basic data, such as data about customers, products, etc. are already available via advertising servers and are therefore directly available in digital form.

Clearly defined service charging and resource usage between ZMS and Zalando

Transfer of well-known controlling concepts to digital business models

**Real-time use
of data raises
the requirements
placed on
controllers**

As data and products were already available digitally, the primary challenge was to prepare, standardise and consolidate this data so that they were usable for ZMS's (financial) needs. This involved, for example, storing company-specific KPIs and the corresponding driver trees (ad-types, fill-rate, CTR, eCPM, scope, etc.²).

The real-time availability of data and the ability to evaluate them has become increasingly important and is one of management's fundamental requirements in ZMS's business model. For example, sales campaigns or performance campaigns are tracked in real time. This results not only in increased demands on the systems, but especially also on the "digital capabilities" of the controllers themselves, who must adapt their work to the fast response times of the business model.

The **reconciliation between the consolidated and non-consolidated view** was a significant reporting requirement because of the specific situation involved – synergies between ZMS and the Zalando platform. The reporting had to reflect and balance the interests of both the Zalando Group overall, and those of the segment and the individual companies. The monthly and quarterly reporting includes both external and internal revenues in order to match the costs to the activities which caused them.

The following section describes how management profit reporting was established based on this underlying reporting system, and how the ongoing management of the business was supported by the planning from controlling.

Ongoing operations

Similar to other industries, the ongoing operations of the digital business model require meaningful management profit reporting as well as financial accounting. The new business model is integrated into the budgeting cycle. This planning enables an actual/target comparison and timely countermeasures on the basis of the reporting system introduced.

Based on this, sales and costs are planned using cost centres. These cost centres match the structure of the digital products described in the introduction in order to reflect a planned contribution margin. In the case of ZMS, the specific areas for the controlling system that were particularly important include sales, personnel, capacities, costs and finances.

² **Ad-types:** types of advertisements, such as banner ads

Fill-rate: ratio of the number of rolled-out campaigns to the number of total advertising inventory

CTR (click-through-rate): ratio of clicks on an advertising banner to the total ad impressions

Ad-impressions: how often users view a delivered ad

eCPM (effective cost per mn): ratio of a campaign's ad revenue to the number of the campaign's ad-impressions in 1000

Scope: relates in advertising to the number of persons reached by an advertising action

The fast-paced and steady growth and changes in business areas within the digital industry make it advisable to establish a flexible planned contribution margin accounting. Management often follows external influences from research, practice and networking events. As a result, the controlling system and the management of the business area must be adapted iteratively to changing business conditions.

The most recent example of this at ZMS occurred when the collabary influencer-marketing solution was launched. The impetus from the digital advertising industry led to a restart of the innovation process. The digital industry is characterised by its openness to making iterative changes to business models which it had previously introduced.

**Constant change
in digital business models
requires flexible
controlling**

Conclusion and role of controlling

The example of Zalando Media Solutions shows that controlling can and should support digital business model innovations in all phases, from brainstorming through ongoing operations.

In doing so, proven methods and approaches can often be used. At the same time, the digital environment offers some opportunities, such as diverse and immediately available data, but also challenges, including the fast pace and constant changes.

Controllers who are aware of this context can make a **valuable contribution to the sustained success of the business model innovation**. This begins already with brainstorming, but primarily affects the structuring of the business idea with regard to the determination of the value add. The corresponding tasks range from defining KPIs relevant to management, performing contribution margin calculations, to financial processes.

In digital business models with their fast response times, the real-time availability of high-quality data and the ability to evaluate them become more important. As a result, controllers who want to make a contribution in this regard must themselves have sufficient “digital skills”.

4.2 Digital business model innovations at Daimler

Author: Julius Niehaus (CASE Portfolio Controlling & Development)

Role and contribution of portfolio management at CASE

Daimler AG	
Revenue*	~ €153bn
Employees*	~ 282,000
Industry	Automotive industry
* in 2016	

To implement the new CASE corporate strategy for Mercedes-Benz, an organisational unit with the same name was established in September 2016. This unit is a part of Mercedes-Benz Cars, Daimler AG's largest business area, with around 130,000 employees and € 90 billion in annual revenue. CASE stands for Connected, Autonomous, Shared & Service and Electric Drive – i.e. it is an abbreviation for the megatrends which are fundamentally changing the mobility industry. In this context, the CASE unit is responsible for connecting these trends intelligently with each other in order to make the existing product offering of Mercedes-Benz Cars not only more attractive, but also expanded by including new, innovative business models. Portfolio management within CASE deals with the strategic management and controlling of the innovation activities in the CASE portfolio. An important component of this strategy is investments in and collaborations with external partners. The resulting **“portfolio of partnerships”** is supplemented with internal incubations, i.e. innovations promoted by employees. Examples of this include investments in firms such as ChargePoint (recharging infrastructure) or Via (real-time ride-sharing), or in incubations such as Croove (peer-to-peer car-sharing). The following section of this application example introduces how this portfolio is managed from a financial perspective. This management provides end-to-end support for the innovation process, i.e. throughout the entire process, and therefore has three specific objectives:

Objectives of the “portfolio of partnerships”

- supporting the organisation's departments involved in digital business model innovations with the initiation and decision-making in the innovation and investment process
- providing incentives and allocating budgets as part of the staged-funding process
- controlling and managing existing incubations and investments in start-ups and serving as a substantive sparring partner regarding various strategic questions

The following section initially reviews the challenges facing controlling as a result of the changed characteristics and requirements of digital business models. This review takes into account that a portfolio is being controlled, not an individual innovation. Based on this, the application example continues by explaining in more detail the role of portfolio management in CASE and how business model innovations are implemented. This explanation will also describe specific work contents. Finally, the last section concludes by providing an overview showing the distinction between the portfolio management approach at CASE and the controlling of the “traditional” business.

Challenges of portfolio controlling in the mobility sector

The prerequisites for portfolio management were created through various cross-company discussions. The specific challenges facing controlling in terms of digital business model innovations were then derived from these requirements. In this way, the **associated problems** were to be deliberately addressed in order to establish the best controlling activities. These problems result primarily from the trade-off between the divergent requirements of the stakeholders involved in the innovation process. On the one hand, controlling must fulfil its original tasks and thus ensure, for example, that information is provided to management. In that way controlling helps ensure that the business model innovation contributes to the company's financial profit/return target. On the other hand, the requirements of the organisational members acting as "innovators" must be addressed. These are the people who wish to bring (business model) innovations to market within the framework of various incubator programmes or through investments that are typically in an early phase. Controlling in this context risks being perceived as a "business case blocker" that needs to be overcome – especially when using traditional methods originally used in the industrial environment – rather than as a necessary and constructive quality gate.

Trade-off between original tasks and the requirements of "innovators"

Moreover, **fundamental differences** between the current business model of Mercedes-Benz Cars (MBC) and new, customer-focused digital business models pose new challenges for controlling. Compared with the former, the new-mobility environment frequently involves considerably more volatile and unpredictable market conditions. This volatility, in combination with relatively limited knowledge about the market and the customers, often leads to a highly iterative process for developing business models and correspondingly frequent adjustments to business models. In addition, digital business models in the mobility sector often have a strong platform character and therefore become profitable only when a critical mass is reached. This is primarily due to the fact that compared to traditional business cases, digital platforms have a significantly higher percentage of fixed costs, and additional performance is possible at very low marginal costs. The life cycle of these digital business models is thus fundamentally different from the typically S-shaped, relatively more predictable life cycle in the production-oriented business.

Core differences to existing business models in the mobility sector

The following figure illustrates this fundamental difference in the life cycle. It also shows how difficult medium to long-term planning is, compared with the MBC business. In addition, it demonstrates that many business model innovations are already discontinued at a relatively early stage (represented by the grey lines).

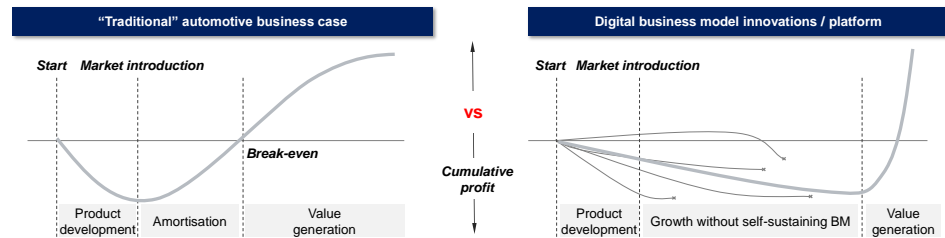


Figure 19: Comparison of value generation in the life cycle of production-oriented and digital business models

Uncertain profitability makes the controller's work more difficult

Perhaps the **largest problem** for controlling digital business models results from this fact, namely that this medium and long-term planning using predefined metrics is often exactly what management wants. Internal innovators are therefore placed into a situation in which, in order to legitimise their business model innovations, the innovators must demonstrate at a very early stage that the targeted innovation does in fact represent a profitable business model. This implies not only a level of predictability and reliability that in reality does not exist, it also often leads to unrealistically optimistic expectations.

Against the backdrop of these challenges, management decided the primary objective of portfolio controlling at CASE is to serve as an **intermediary** in the trade-off mentioned above between divergent requirements. Portfolio controlling is therefore expected, on the one hand, to support internal innovators in an advisory capacity and, on the other hand, to create an understanding vis-à-vis management regarding the peculiarities about managing digital business models. How this is achieved in this application example is explained in more detail in the following section.

Modified approaches in portfolio controlling

In order to best meet the objectives of portfolio management at CASE based on the core differences listed above (other drivers of the business model, high volatility, low predictability), MBC took several measures at both the procedural and content level as well as in terms of information technology mapping.

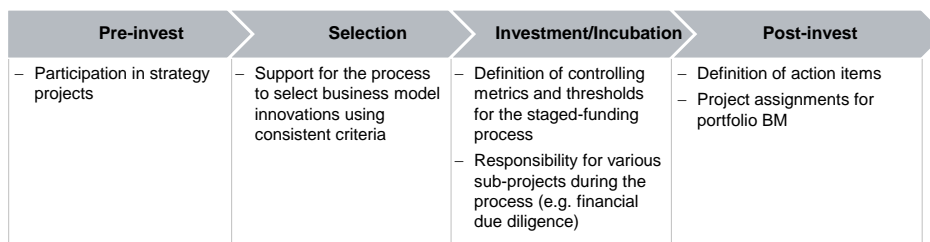
Intensive involvement of controlling in the innovation process

At the procedural level, the primary measure was to enable a more integrated involvement by controlling in the innovation process. This aims to avoid the financial responsibility for an incubation or an investment being “forwarded” to controlling only after its completion. This is particularly important as a way for controlling to develop a better understanding of the business model. At the same time, the more intensive involvement by controlling also promotes stronger thinking in terms of numbers and results. To illustrate this, it is worthwhile to take a look at the innovation process.³ Specifically, the process begins when members of portfolio controlling assume an active strategic finance role in strategy projects even before the digital business model innovations are initiated. As a rule, these strategy projects lead to fundamental investment recommendations, either in internal incubation projects or in external start-ups. These initiatives are expected to contribute to the development of innovations.

³ This reference is to the generic innovation process. It is not a specific MBC process.

Controlling's task in the next process step is to support the **selection process** using clear and consistent selection criteria. In the third phase, the **investment phase**, controlling assumes responsibility for work packages (such as financial due diligence), which are closely related to the subsequent management of the business model. This phase also includes defining metrics against which the business model will be measured in the future as part of a staged-funding process. In principle, this term refers to the gradual approval of new funding depending on the achievement of various metrics. This process does more than just contribute to risk minimisation, it primarily also acts as an incentive.

Against this background, various **metrics** must be used in order to assess whether the individual business models are "worthy of promotion" (for example, at intervals of 6-12 months). In this context, the consistency and binding nature of these metrics are particularly important. This means that the metrics which are set during the investment phase will continue to be used throughout the life cycle. Of course, while this may sound self-explanatory, often very promising metrics are used in the innovation decision to justify an investment (as indicated above). Thereafter, however, they are not used for tracking and deciding whether to continue with the model innovation.



Phases of portfolio controlling

Figure 20: Portfolio controlling tasks in the mobility sector

The metrics are not selected using a standard approach. Instead, they must be defined based on three influencing factors. Different metrics must be selected depending on the phase of the business model innovation. This approach is needed because of the strong focus of the controlling model on the life cycle and thus the maturity of a product. Fundamentally, the following three factors influence the selection:

- **Life cycle stage:** What phase is the innovation currently in and what are the corresponding success factors (e.g. in the early phase of a platform business model, the number of downloads)?
- **Objective:** Which objective is being pursued with the business model innovation (e.g. new source of revenue, access to new technology, creation of synergies to other business models, employee recruitment, etc.)?
- **Business model:** What are the characteristics of the business model (operationalised by a specially developed business model classification, which assigns metrics depending on the type of the business model)?

Criteria for selecting metrics

As a rule, these three core influencing factors lead to quite different controlling systems, which must be developed individually for each business model.

However, there are some tendencies in portfolio management. These are briefly illustrated by the following figure and compared with typical production-oriented controlling.

Category	Dimension	“Traditional” automotive business case	Digital business model innovations/platform
Controlling model	Integration into other controlling systems	High	Low
	Vertical integration	Top-level	Team/Squad
Key performance indicators	Objective orientation	Input/Efficiency focus (e.g. RoS)	Output/Effectiveness focus (e.g. growth and size)
	Timing orientation	Lagging/retrospective KPIs	Leading/Potential-oriented KPIs
	Time horizon	Medium to long term (up to 10 years)	Short term (up to one year)
	Financials vs. non-financials	Formal/Financial targets	Substantive/Non-financial targets (e.g. retention rates, churn rates, etc.)

Figure 21: Traditional controlling vs. controlling of digital business models⁴

Specifically, the characteristics of controlling digital business models can be illustrated using Figure 22. It shows that the controlling system must reflect the requirements of the respective stage in the life cycle and contain the corresponding metrics. While customer metrics are tracked throughout the entire life cycle, financial metrics typically become relevant for controlling purposes only as the business model matures.

Relevance of customer-related and financial metrics during the life cycle

	Alpha <i>Start of an MVP</i>	Beta test <i>Development of product-market fit</i>	Growth <i>Expansion</i>	Maturity <i>Dominant position</i>	Re/Degeneration <i>Renewal or decline</i>
Customer-related metrics	Attention: Scope and awareness of the product in the market (e.g. # of likes, downloads, etc.)				
	Conversion: Conversion of potential customers into actual customers (e.g. conversion rate, # of generated leads, etc.)				
	Customer satisfaction: Customers' satisfaction with the product (e.g. net promoter score, etc.)				
	Retention: Customer loyalty (e.g. daily/monthly active users, # of former vs. recurring users, etc.)				
Financial metrics	Cash-burn rate: Period in years until the company is insolvent (amount of funding needed to maintain business activities)				
	Market and revenue metrics: (e.g. market share, revenue/growth)				
	Customer acquisition cost: average costs needed to acquire a customer				
	Traditional financial metrics: (e.g. ROI, etc.)				
				Specific metrics: (e.g. capacity utilisation rate)	

Figure 22: Example of a life-cycle-oriented controlling of a platform-based business model

In the last phase, the post-invest phase, the actual controlling takes place. This means that based on the metrics previously determined for the staged-funding process, measures are defined and decisions are made regarding the continuation or termination of various business model innovations in the portfolio. It is very important for this process that **controlling has a particularly thorough understanding of the business model**. This understanding is fostered through project assignments within the business model portfolio. In these assignments, the employee in portfolio controlling responsible for a specific business model innovation assumes for a certain time period, e.g. one month, various business development activities, and is completely released from his/her actual duties.

Finally, this last section of the application example includes information on how the controlling of business model innovations in the mobility sector is **depicted from a system and IT perspective**. Although some common characteristics sometimes exist between the business models in the portfolio, e.g. in platform-based business models, they require a different controlling system

⁴ Integration in other controlling systems refers to the extent that controlling logic is incorporated into higher-level planning processes. Vertical integration refers to the granularity in the controlling model, i.e. the level at which controlling takes place.

because the respective influencing factors of life cycle stage, objective and business model are always different. For that reason, it is possible to use uniform solutions to only a limited extent. In the past MBC has frequently used real-time KPI dashboards, such as Geckoboard. These tools allow controlling activities to be customised and enable the analysis of metrics through connections to various web services (e.g. in an iOS application, tracking the number of downloads over time, or integrating Google Analytics into the dashboard in order to better understand the awareness of the business model).

Conclusion and role of controlling

Controlling of digital business models in an area influenced by multiple uncertainties, such as the new-mobility market, is often a balancing act – between commercial reason and the ability to vigorously tackle business model innovations with medium to long-term market conditions that are partly still unclear. This report from corporate practice was intended to provide an overview of how CASE handles this challenge. It also aimed to demonstrate that an integrated understanding and thus the complete integration of controlling in the innovation process is especially necessary in order to address the new tasks adequately. It is likely that the **end-to-end involvement of controlling in the innovation process will intensify** in the future. In order to continue generating added value in this process going forward, the controller's role will increasingly depend on substantive competence and expertise far beyond financial metrics.

Controlling of digital business models is a balancing act

4.3 Digital business model innovations at KUKA

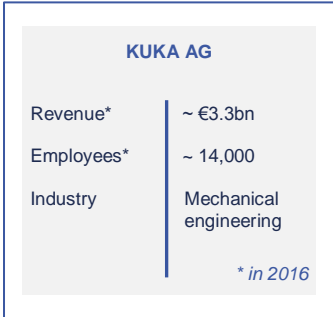
Authors: Dr. Robin Zorzi (Head of Controlling Industry 4.0)
 Philipp Lill (Advanced Technologies)

Digitisation at KUKA

The terms “Digitisation”, “Industry 4.0” (I4.0) or the “Internet of Things” (IoT) are currently an indispensable component of the discussions many industrial companies are having about their futures. KUKA is not an exception to this trend.

The group, which is based in Augsburg and has locations in Europe, the U.S. and China, has had a significant influence in recent decades on the progress made in automation, particularly in the automotive industry. The great challenge now is to prepare the group and its Robotics (industrial robots / component manufacturing), Systems (machine construction for automotive) and Swisslog (machine construction for logistics/healthcare) business areas for the future, and to use the potential resulting from the growing networking of machines (smart products) and production systems (smart production).

The group created a group-wide I4.0 matrix function within the corporate organisation in order to address this transformation process (see Figure 23). Its responsibility is to support the business areas both strategically and operationally by rendering marketing/presales/consulting services (**corporate shared service function/I4.0 Accelerator**). When establishing their digital product and solution portfolios, the business areas can also utilise a central IoT platform (**Connyun GmbH**). In addition, supporting competence centres also exist within the operating business areas. The **Chief Digital Officer (CDO)** is the head of the group-wide I4.0 matrix function at KUKA. Furthermore, the achievement of I4.0 objectives is a fixed component in the group’s remuneration system.



Central I4.0 matrix function

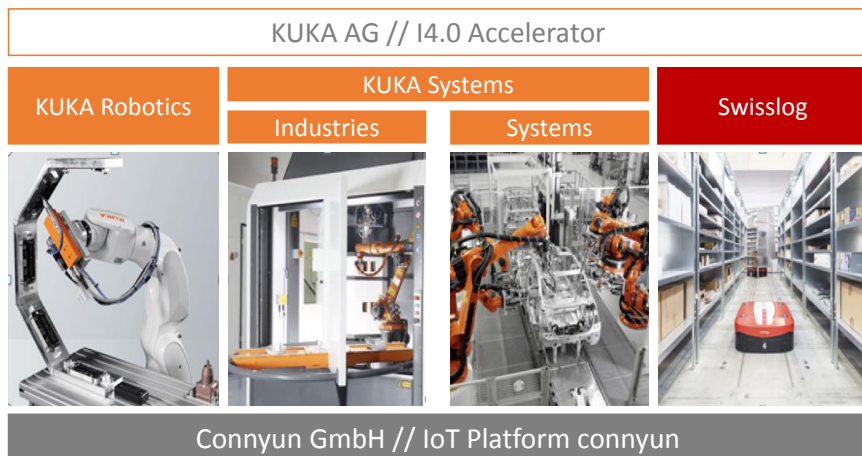


Figure 23: Corporate organisation at KUKA AG

Fundamentally, digitisation is not an end in itself. The added value for customers must be taken into account in all considerations. Digitisation projects can realise this added value, for example by using new technologies and growing networking to enable an optimisation of traditional KPIs for production drivers, such as the availability and working efficiency of machinery. Digitisation, however, is also the basis for business model innovations. Particularly noteworthy examples of this include service-driven business models, in which the customer no longer pays to purchase machines, but only for their performance (pay-per-use). The increasing networking of intelligent products makes it possible to collect, share and evaluate bundled data about every movement of all connected machines, and thus to draw conclusions about the work performed and causes of errors, or to identify potential efficiencies. The resulting customer benefit is initially reflected in cost savings, for example in product development and customer service. In addition, revenue increases can also be achieved through a digitally enhanced product and the associated digital service and data business.

The aforementioned IoT platform is crucially important when implementing business model innovations (see Figure 24). KUKA uses the IoT platform offered by Connyun GmbH to address not only large original equipment manufacturers (OEMs) and system integrators, but especially also medium-sized machine builders, which themselves have only limited capacity to set up their own digital infrastructure. KUKA in this respect sees itself as a supplier of IoT platform solutions with traditional system construction/mechanical engineering expertise. It deliberately avoids creating barriers to entry and aims to establish a comprehensive ecosystem of machine manufacturers, production operators and software providers.

Customer added value is the starting point

IoT platform is crucial for implementing business model innovations

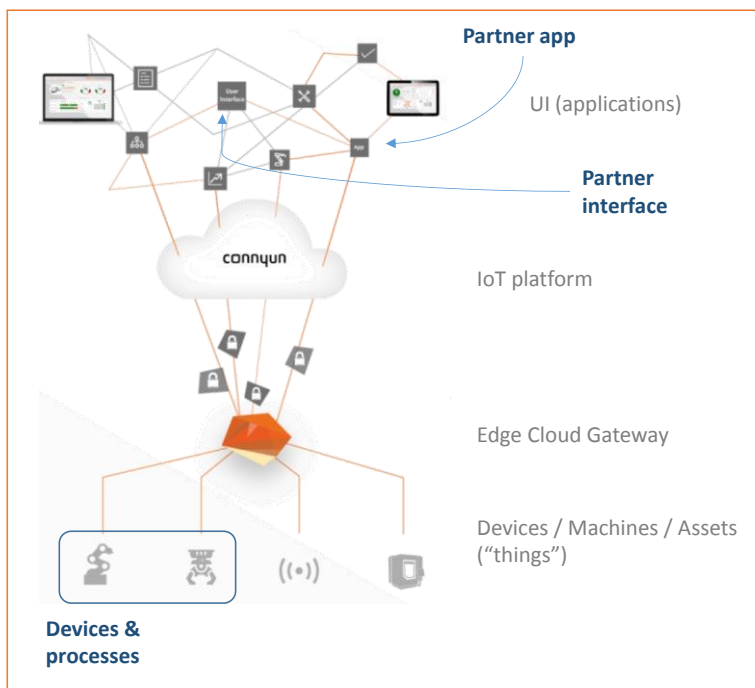


Figure 24: KUKA's IoT architecture model

Customers have the possibility either to utilise the services of the IoT platform (**platform-as-a-service – PaaS**) and the applications that run on it (**software-as-a-service – SaaS**), or to develop their own applications and make them

available via the IoT platform. The necessary infrastructure services (**infra-structure-as-a-service – IaaS**) are procured externally. KUKA decided to outsource these tasks to a newly established company primarily in light of the flexibility and agility that were needed. Compared with other KUKA companies, this therefore involves a deliberate decision to allow a level of procedural freedom in order to focus on the I4.0 issue.

Role of Controlling

Controlling's objective is to support this digital transformation from a commercial perspective as a business partner. Controlling's tasks with regard to KUKA's organisational structures are multi-faceted and focus in particular on **(1) strategic controlling/strategic business development (2) operational controlling** and **(3) process management/project management tasks**. Controlling's core objective is to provide decision-relevant information for the CDO and the management of the I4.0 matrix function, as well as for KUKA's group management board. In addition, controlling serves as the commercial interface to the business areas.

The tasks in **strategic controlling/strategic business development** focus on the creation of business plans, which represent the foundation for the initial investment decisions in the I4.0 matrix function. New business models are developed prior to the creation of the business plan. KUKA's previous experience has shown that it is fundamental for controlling to be involved in the strategy process at an early stage in order to derive solid planning. The challenges in this regard include that in I4.0 the main issue involves the assessment of potential future success, which is difficult to quantify due to a lack of historical data. This means controlling must work with the CDO or the manager of the I4.0 matrix function to continuously scrutinise the discussions on the future digital service and product portfolio and the resulting market expectations. That way controlling is able to make a realistic assessment of the potential for financial success. This also includes determining pricing strategies and actual price calculations, taking into account the group's own cost structures and the willingness of KUKA's customers to pay.

In terms of **operational controlling (group, I4.0 matrix function)**, different requirements exist for controlling from the group and I4.0 matrix function perspective. Controlling's role from a group perspective focuses on ensuring that all company units continuously report the customer project revenue of all projects that KUKA has declared to be a I4.0 customer project. This aims to ensure an ongoing measurement of the digital I4.0 transformation process. In this regard controlling is also responsible for defining the criteria for determining I4.0 revenues, now that I4.0 target achievement has been integrated as a fixed component into the group-wide remuneration system at KUKA. The tasks related to the operational controlling of the I4.0 matrix function include the preparation of budgets, forecasts and plan/actual comparisons for the I4.0 Accelerator unit, which is operated as a shared service centre within KUKA AG, and for Connyun GmbH, which operates as an independent company.

Besides fulfilling strategic and operational controlling responsibilities, controlling also serves as a central commercial interface to KUKA's business areas. Controlling of the I4.0 matrix function, in coordination with the controlling

Assessing potential is a significant challenge

counterparts in the business areas, is also responsible for determining transfer prices, e.g. for the use of the IoT platform. This task is particularly important when new customer projects are involved. In addition to these coordinating activities, controlling is also responsible for **defining all financial processes** (planning/monthly closing/cost accounting) and **customer processes** (purchasing/sales) for Connyun GmbH. The challenge in this regard is to ensure compatibility with KUKA's standard processes, while at the same time deliberately allowing process deviations or process simplifications in comparison to the KUKA standard. The process management responsibility also includes the **enhancement of all customer and financial processes** when internal IT projects are undertaken, such as the deployment of an ERP system or the planned introduction of a CRM system.

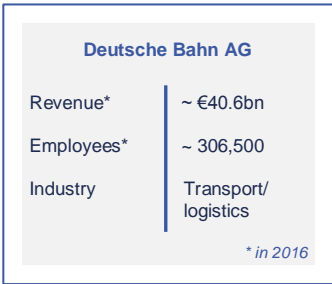
Both management and shareholders have high expectations about the success of I4.0 for KUKA. Ultimately, this means that the successful I4.0 transformation must also be reflected in long-term revenue and margin growth. Controlling's task is to steer towards this long-term goal. From a commercial perspective this requires not only quick and unbureaucratic support of the departments or divisions being supported, but also that when target deviations are identified, controlling must remind all participating business units about the realisation of the corporate goals they have set, and insist on the implementation of measures to achieve them.

**Long-term focus
on revenue and
margin trend**

4.4 Digital business model innovations at Deutsche Bahn

Author: Wolfgang Heinrichs (Head of the FINANCE 4 DB Group Programme)

The Deutsche Bahn Group and its finance function



The **Deutsche Bahn Group (DB)** is an international provider of mobility and logistics services that operates globally in more than 130 countries. Nearly 40% of its more than 300,000 employees reside outside Germany. DB, which in 2016 realised revenue of more than € 40 billion, operates with 8 business areas in all segments of the transportation market. More than 12 million passengers use the trains and buses of the Passenger Transport division every day throughout Europe. The group’s freight transport and logistics division transports nearly 280 million tonnes of freight every year by rail, and around 100 million packages by road. DB in Germany operates Europe’s longest rail network, with 33,000 km, and is also Germany’s fifth-largest energy supplier.

The group’s strategy, which is based on the principle of sustainability, focuses on the dimensions of economy, ecology and social affairs, and places particular emphasis on the topics of quality, digital competence and increasing individual performance.

Digitisation is a catalyst for more quality and customer service

Digitisation in this regard is understood to be a catalyst for more quality and customer service, and the group’s digitisation activities pursue a clear strategy, which also includes the build-up of an inhouse, open and scalable innovation ecosystem. DB aims to be a driver of digitisation and actively participate in shaping the digital future of mobility and logistics.

In this context, around 3,000 employees of the **finance function** work in the areas of procurement, accounting/tax, controlling and treasury. The processes and activities assigned organisationally to these areas are rendered for all business areas (see Figure 25).

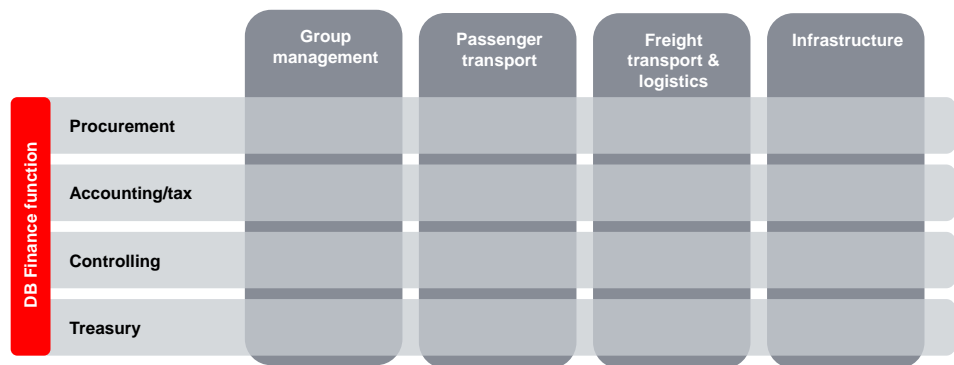


Figure 25: Work areas and responsibilities of the finance function at Deutsche Bahn

It goes without saying that the focal points of the group’s strategy, which are “quality”, “digital competence” and “higher personal performance”, apply not only for the group’s operating divisions, but also and particularly for the finance function.

FINANCE 4 DB – Motivation and objectives

Against this backdrop, the group launched the group-wide **FINANCE 4 DB** programme in mid-2017. This programme aims to realise a noticeable increase in the performance of the finance function using the possibilities offered by digitisation and through the joint design of the required change process. This means the finance function aims to build on the initiative which it began five years ago to become a business partner, and is now placing a clear focus on increasing performance through digitisation. But why is Deutsche Bahn thinking so fundamentally about digitisation in the finance function that it has decided to set up a dedicated corporate programme for this purpose?

Digitisation is fundamentally changing our world, and this is naturally true for Deutsche Bahn's business too. The group has experienced some major disruptions, for example in its business models, in its customers' expectations, in the skill sets of its employees, in working methods and in forms of collaboration. The finance function is responding in this context and aims to actively exploit for itself the opportunities of digitisation that arise from at least two aspects.

First, digitisation of the finance function provides new opportunities and tools that will help to significantly improve the support for the management of the group's operational business. Real-time and near-time support, virtually unlimited (and relatively inexpensive) computing capacity for analysing very large amounts of data (Big Data) and modern forecasting tools (predictive analytics) are just a few of the keywords that are being considered in this regard. This will enable the finance function to perform its role as an active partner in the business in an even more competent and beneficial manner. This is necessary primarily because the rapidly changing market and general conditions lead to a high degree of uncertainty and pose new challenges for the finance function. Speed and clear steering impulses are needed more than ever.

Second, digitisation can provide significant benefits for the enhancement of the finance function itself. Standardisation and automation are the main levers to significantly simplify and standardise the process and system landscapes. Intelligently used algorithms (robotic process automation) can replace manual tasks, especially at the many interfaces of different systems, and thus create capacity for other activities. This also creates opportunities for the finance function to be even more active in its role as a pilot in uncertain waters. At the same time, the changing working methods associated with digitisation (keyword agility), and the new forms of collaboration, open up additional opportunities.

Both aspects of digitisation were incorporated into the objective formulated for FINANCE 4 DB, and were encapsulated as follows: **FINANCE 4 DB aims to make a significant contribution to improving the qualitative management of the business and increasing the efficiency and excellence of the finance function overall.**

Tools and opportunities of digitisation

Optimisation of the finance function itself

FINANCE 4 DB – Shaping change

Exploiting the potential offered by digitisation (above all through standardisation and automation) is clearly in the foreground of FINANCE 4 DB. At the same time, the programme is also pursuing a holistic approach to transformation over the medium term. The programme's activities were defined in the following four areas of activity, which set the framework and at the same time describe the sequence of the activities (see Figure 26):

Areas of activity of Finance 4 DB

- processes and structures
- methods and tools
- role and identity
- capabilities and collaboration

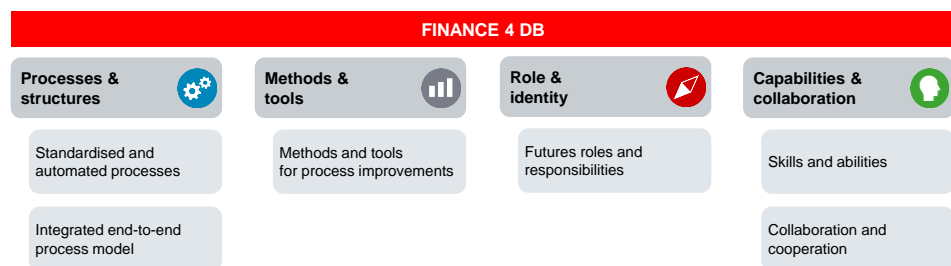


Figure 26: Areas of activity and focal points of Finance 4 DB

The programme starts and focuses on noticeable improvements in the main financial processes. Simplifying, standardising and automating are the levers for more efficiency. At the same time, the programme aims to realise a significant improvement in transparency and management quality. Modern IT methods and tools can support the identified process improvements. In parallel to the new process and IT landscape, the roles and skills of persons involved in the finance function and their collaboration in modern working environments are changing as well. The primary contents of the areas of activity will be further elaborated below.

“Processes and structures” area of activity

Every improvement in efficiency and excellence applies in particular to processes and structures. Process optimisations through digitisation are realised primarily **through standardisation and automation**. To achieve them, however, important prerequisites must first be created, because automating existing – and potentially suboptimal – processes does not make sense. FINANCE 4 DB is taking a gradual approach in this regard. The first step involves taking an inventory of the significant processes in the finance function. This inventory focuses on the main processes of the procurement, accounting/tax, controlling and treasury functions. The approach becomes very focused in the second step, which concentrates on a few sub-processes with a significant need for optimisation. In these cases target processes are developed, which, in turn, are part of end-to-end processes. The development of specific target processes for a few sub-processes is the focal point of the work over the coming months. FINANCE 4 DB aims to focus as concretely

Gradual optimisation of the finance function's processes

and concentrated as possible on the processes with the greatest weaknesses. All other activities will then follow.

From today's perspective, the focus on end-to-end processes will be the dominant guiding principle for the future process landscape. A review across functional interfaces and process breaks caused by business areas makes it possible to understand the internal customer requirements placed on the finance function and to improve the response to them. An integrated overall process map, which is coordinated with the business areas, helps in this regard. This coordination is essential for several reasons, including to orient the future activities of the finance function towards the needs of the business, eliminate redundancies, decrease interfaces and clearly assign responsibilities. Only then will standardisation and automation follow in the third step. Deutsche Bahn is convinced the potential use of RPA solutions (robotic process automation) will be a win-win situation for the finance function. Employees will perform fewer manual tasks and therefore have more capacity to take on even more intensive tasks, focusing on analysis and having an interpretation and advice character for decision support. At the same time, the quality of processes will be improved.

The programme intends to redesign functional structures in order to accelerate decision-making and escalation paths and thus increase response times noticeably. The assignment of process responsibility and task allocation to centralised and decentralised organisational units will also be examined, as will the organisational anchoring of digital competences, for example in lab structures or in a centre of excellence (e.g. a data science centre).

The early and regular involvement of employee representatives from the beginning is a matter of course for FINANCE 4 DB. The design of such a comprehensive change process can succeed only through a joint effort.

“Methods and tools” area of activity

The implementation of process optimisations is supported by a specific area of activity for IT solutions and digital methods. Here FINANCE 4 DB places the **highest priority on a user orientation**. The future applications of the finance function should be as simple and intuitive as possible. This is to be achieved, for example, by using an app-based approach. There are also initial considerations regarding voice-controlled solutions. Innovative methods and technologies, such as advanced analytics and artificial intelligence, offer, in combination with modern databases, additional potential to create an attractive solution platform for the finance function. This will enhance the management of DB not only from a substantive perspective, but also methodologically/technologically. Data governance is particularly important in this regard. With increasing digitisation, the corresponding requirements rise noticeably. The finance function, together with the group's management and the business areas, must clarify who in the future will assume responsibility for the governance of which data. Governance in this context is the responsibility for the data source (single source of truth), data quality, data availability and data definitions. While governance of financial data naturally belongs in the finance function, other companies demonstrate that data governance for significant KPIs is also in good hands in a neutral finance function. This approach is

**Focus on data
governance**

supported by the general trend towards making the finance functions responsible for performance measurement in the company, and thus for a more meaningful and decision-supporting combination of financial data and significant metrics of the operating business. DB already reflects this trend because it carries out regular performance review meetings (PRM) with the participation of the group's management board. The data supporting the PRMs are today already provided by the finance function. FINANCE 4 DB can thus build on this foundation.

Today's system landscape is characterised **by a wide variety of different applications with very different interfaces** and – in terms of end-to-end processes – numerous system breaks. The objective in this case is to gradually achieve a considerable simplification. This requires that all participants understand why a fundamental streamlining is necessary, and additionally that they are willing to abandon their own IT solutions in favour of a standardisation that is meaningful and cost-efficient from a group perspective. This is one of the programme's significant challenges applicable for both the system world and the process optimisations, and, strictly speaking, for all of the programme's optimisation initiatives.

“Role and identity” area of activity

These changes will require **a change in the future role and identity of the finance function**. The role model as a business partner is appropriate in many areas and must probably also be enhanced. FINANCE 4 DB will address the future role model at a suitable point in the future, which depends on the knowledge gained from the process optimisations and the use of new methods and tools. From today's perspective, indisputable components of a future role model include a broad understanding of the business, a market and customer-related approach, communication and collaboration, and advisory and digital competence.

As a new task in connection with digitisation, group-wide governance in standardisation and automation (including transparent data structures and a harmonised system landscape) is an important topic. In addition, the programme discusses the drivers of efficiency gains and digital transformation, the provision of user-oriented and management-relevant data, and how new ways of working are placed into practice. In this context, empowering and developing employees is also very important for the challenges in the digital workplace.

FINANCE 4 DB conducted an online survey in the finance function and among its business partners about the function's own image of itself and how others view it. The purpose of this survey was to identify necessary further developments in the function's role and identity. The survey results provided additional information on the strengths and development needs of the finance function.

Responsibilities under digitisation

“Capabilities and collaboration” area of activity

Changes succeed **only together with the employees**. The “capabilities and collaboration” area of activity contributes to that end. Deutsche Bahn recognised early on that the qualification, motivation and mobilisation of employees are requirements to achieve the objectives mentioned above. As a result, FINANCE 4 DB has been working with the DB-internal training organisations (DB Academy, DB Training) to design a portfolio of offerings (“finance solutions”) for the finance function. Individual modules will convey knowledge, teach skills, coach new forms of collaboration and practice communication and interaction. Besides customised training, other offerings include inspiring workshops, motivational lectures, video statements or webinars. This will make it possible for colleagues in the finance function to carry out their future role as best as possible, while gradually expanding their skill set. A particularly important focal point for FINANCE 4 DB in this context is the build-up of data science skills and networking with DB’s own digitisation ecosystem and with external start-ups.

DB expects that its managers will actively promote digitisation in their areas of responsibility, and serve as role models in the change process. Corresponding training will be offered to support them and enable them to operationalise digital target visions for their divisions and to create suitable conditions to achieve them. When doing so, agility and collaboration will play an important role.

The “capabilities and collaboration” area of activity therefore shapes equally both the change process and the cultural framework of the future finance function. Activities for the coming months are planned in a work programme as a change journey.

Role of managers

FINANCE 4 DB – Value contribution for DB

Even though FINANCE 4 DB has only just gotten started, it already has clear ideas about its objectives, approach and special challenges. The four areas of activity describe the way in which a comprehensive change in the finance function is to be achieved over the medium term. Mastering the significant associated complexity is one of the programme’s special challenges, in addition to the close involvement of group management and the business areas.

The specific next steps include carrying out an inventory of the current financial processes and the IT systems being used today. At the beginning, FINANCE 4 DB will very deliberately focus on specific improvements of a few sub-processes. They, in turn, will be the starting point for further standardisation and automation considerations. In parallel, work is being carried out on so-called speedboats, with which digitisation opportunities can be realised in a short time. Examples include the expanded purchasing portal for office supplies or the trial use of blockchain in treasury. Such demonstrable examples of digitisation can create acceptance and make the change visible.

From the outset, FINANCE 4 DB has focused on the objectives of “qualitatively improving the management of the business” and “increasing the efficiency and excellence of the finance function”. The changes necessary to

achieve these objectives offer opportunities for all employees. A later enhancement of the role and identity can help with the positioning of the finance function within DB. The planned support, communication and training offerings are expected to help expand individual skills and place into practice new forms of collaboration. The necessary additional capacity to accomplish that will be created by discontinuing manual and repetitive tasks. This can succeed only with comprehensive standardisation and automation of processes and a noticeable streamlining and standardisation of the system environment. In addition, new skill sets (e.g. data science) will be added.

Success depends on the willingness of each individual to change

Changes also always generate **uncertainty and resistance**. Everyone involved in the initiative is aware of this. That is why they will proceed in an open and transparent manner. FINANCE 4 DB in this situation can provide reassurance by showing how the possibilities of digitisation will enable DB's finance function to develop further, position itself positively for the long term and become even more productive. Success depends on the willingness of each individual to change and on the overall collaboration of everyone involved. The transformation process initiated with FINANCE 4 DB is still in its infancy. The change is equally both an obligation and an opportunity – for a qualitatively better management of the business, for an increase in each individual's own efficiency and excellence, and ultimately for each individual's own contribution to the success of Deutsche Bahn – put simply, FINANCE 4 DB.

Conclusion and role of controlling

Digitisation offers many opportunities, especially also for controllers. While markets, business models and customer expectations change rapidly, clear controlling impetus and immediate analyses are always in demand. To that end, controlling can rigorously use the possibilities offered by digitisation to improve processes and structures as well as methods and tools, while at the same time enabling an enhancement of controlling's own role and identity, as well as its capabilities and collaboration. The **controller will become a change agent** in the digital world.

5 Conclusion: Master the digital transformation with the help of controllers!

In the age of digitisation, it is crucial for companies' competitiveness that they recognise the potential associated with digitisation at an early stage and systematically exploit it by adapting their business models. Companies that do not recognise this need, or recognise it too late, risk lagging behind and being forced out of the market. Decision-makers therefore face the challenge of planning and managing the digital transformation of their business models in an appropriate manner. This starts with brainstorming regarding the realignment of the company's own business model and extends to the successful implementation of a business model innovation in ongoing operations. **During the entire innovation process** decision-makers are **dependent on the support of the controller**.

Controllers can make a valuable contribution in many ways to the development and implementation of digital business model innovations. However, this requires some prior knowledge. For instance, controllers should deal intensively with the subject of business models and business model innovations before getting started. In this context, controllers should be familiar with the components of the business models and where the essential levers for digital business model innovations are located. Controllers should also have a clear understanding how digital business model innovations are categorised in principle and which of these categories are relevant for their own company. Then, in order to participate in a targeted manner in the specific efforts to brainstorm and implement ideas, controllers should be familiar not only with conventional innovation methods, but also with new approaches, such as Design Thinking or Lean Start-up. Besides the development and implementation of digital business model innovations, they must also not neglect the associated digital transformation of controlling itself. In particular, the focal points of this transformation will be on how controlling processes can be made more efficient by means of comprehensive digitisation, which new controlling methods and tools are to be used, and what new skills will become necessary.

The application examples which we have reviewed in this Dream Car report show that today **controllers with creative will, conceptual strength** and the necessary **understanding of the market and the business** are already spearheading digital business model innovations in their companies. This illustrates the indispensable role of controllers in this context. Our conclusion is therefore:

The digital transformation can be successfully mastered only together with the controller!

As the influence of digitisation varies greatly depending on the company's business model, the substantive focal points of the digital transformation must always be elaborated individually for each company. However, the digital transformation involves certain key questions that controllers should address, regardless of the industry and the specific characteristics of their company's

Controllers can and should contribute in a variety of ways

business model. These relate to both the development of a **performance management system** suitable for digital business models, and to the **role of controllers and their activities** in the context of the digital business model (see Schönbohm/Egle 2016, p. 6).

Key questions that controllers should ask themselves

The following questions are particularly important regarding the development of a performance management system suitable for digital business models:

- What are the key dimensions for the success of digitisation from the perspective of our company and our industry?
- Which digital metrics are common in our industry?
- Which metrics can we generate ourselves, and which must be generated by external partners?
- Do we have the statistical analysis capabilities in the company to meaningfully evaluate large amounts of data (keyword: Big Data)?
- Which controlling tools can we use to measure the value contribution of digital products and services?
- How are the non-recurring and ongoing costs associated with digital transformation calculated?

The following questions are essential regarding the role and activity of controllers in the context of a digital business model:

- Do we need a Chief Digital Performance Officer instead of a controller for the digital business?
- How should a company manage semi-autonomous start-ups that are an important component of the digitisation strategy?
- How can controlling use SCRUM and other agile project management methods to implement a playful performance culture in start-ups?
- How can controllers develop their professional skills to meet the new requirements?
- How do you deal with colleagues who do not fit into the new digital performance culture?

From the controller's perspective, answering these key questions will **create an important basis for the successful implementation of digital business model innovations**.

Literature recommendations – Journal contributions

For beginners



Traditional business models are under pressure in nearly every industry. Newcomers are able to attack and eliminate market leaders within just a few years, primarily thanks to the technological advances associated with digitisation. In their article **“Fit for the Future”** (Harvard Business Manager: July 2017 edition), Carsten Linz et al. show how stagnant companies can get moving again.



What does a business model look like that successfully exploits the potential of a new technology? To answer this question, Stelios Kavadias et al. researched 40 different companies that have introduced new business models. In their article **“The Transformative Business Model”** (Harvard Business Manager: April 2017 edition), the authors introduce the key findings of their analysis and illustrate how these findings can transform entire industries.

For advanced



The global economy currently focuses on just a few digital companies (e.g. Alphabet/Google, Amazon, Apple or Microsoft). Marco Iansiti and Karim R. Lakhani address this environment in their article **“The New Monopolies”** (Harvard Business Manager: January 2018 edition) and describe how digital platforms dominate entire sectors of the global economy, and how traditional companies must find new ways to compete in the marketplace.



Five of the world’s ten most valuable companies owe most of their market value to digital platforms. Hagiu et al. describe in their article **“Is Your Product Suitable for a Platform Strategy?”** (Harvard Business Manager: December 2017), how companies – based on their regular products or services – can design digital platforms. In addition, they explain the opportunities and risks associated with such a business model.

Literature recommendations – Books

For beginners



Many managers consider Apple, Google or Amazon to be models of companies that have successfully mastered the digital change. But only a few companies succeed in recreating the success of these giants. Christian Hoffmeister and Yorck von Borcke have summarised in 22 principles of success what Apple and Co. have done “correctly”. They present these principles in a theoretically sound and practice-oriented manner in their book **“Think New!”**.

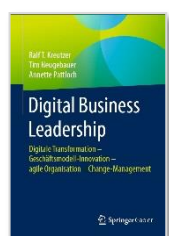


In his book **“Business Models in Industry 4.0 and the Internet of Things”**, Timothy Kaufmann discusses the potential and challenges of digitisation for the transformation of business models. The author focuses on how existing business models can be enhanced through digitisation and, in addition, on the principles of how new business models should be designed.

For advanced



Digital Transformation of Business Models, a book written by Daniel Schallmo et al., shows how the digital transformation of business models can succeed across the entire value chain. The book’s 700 pages cover various approaches, tools, study findings and best practices from different industries in the context of digital transformation.



Ralf Kreutzer et al. review in their book **“Digital Business Leadership”** the dramatic upheavals in entire industries related to digitisation, and how established companies mastered the digitisation processes. In this context, academic models paired with practice-relevant methods are illustrated using specific business cases.



The focus of the book **Develop New Business Models for the Cloud** (publisher: Fraunhofer Institute for Industrial Engineering IAO) is cloud-based business model innovations. It illustrates a multi-level approach to developing and implementing business models for providers of cloud applications. In this context, the book covers the individual elements of a business model (e.g. offer, partner or price model).

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