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 and business

The background is a blue gradient with a pattern of binary code (0s and 1s) and a central graphic of a human head in profile, with a brain inside, surrounded by circuit-like lines.

Digital Transformation for Managers

Opportunities, Strategies, and Pitfalls

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Groningen Digital Business Centre (GDBC)

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Digital transformation puts enormous pressure on companies to become more digital. By incorporating digital technologies in their businesses, companies can generate value for their customers in fully new ways. The key to such value creation is the utilization of new digital business models. Depending on the circumstances, firms might offer a part of their products for free, change to a service-driven business model, or create a platform.

However, digital transformation remains inherently risky and business model transformation is time-consuming and costly. Managers need to be aware of several pitfalls such as changing organizational structure, culture, and leadership. Moreover, in the process of change roles of employees change and some might even show resistance to digital transformation initiatives.

In this book chapter, we discuss digital transformation, digital business models, and potential pitfalls and provide practical guidance for managers. This chapter enables managers with a broad overview of research on digital transformation but also accounts from practice.



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Digital Transformation for Managers: Opportunities, Strategies, and Pitfalls

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Table 0
The Idea in brief

The Issue	The Response	The Bottom Line
What is digital transformation and how can it generate value for firms	Digital change occurs in phases and there are various potential digital business models	Digital transformation is risky and time consuming but not transforming is not an option
Digital transformation requires new business models that utilize digital technologies	Changing the business model is a time consuming process that has several potential pitfalls	Implemented in the right way, digital transformation makes the company future proof

Why digital transformation is the biggest opportunity and threat for your business?

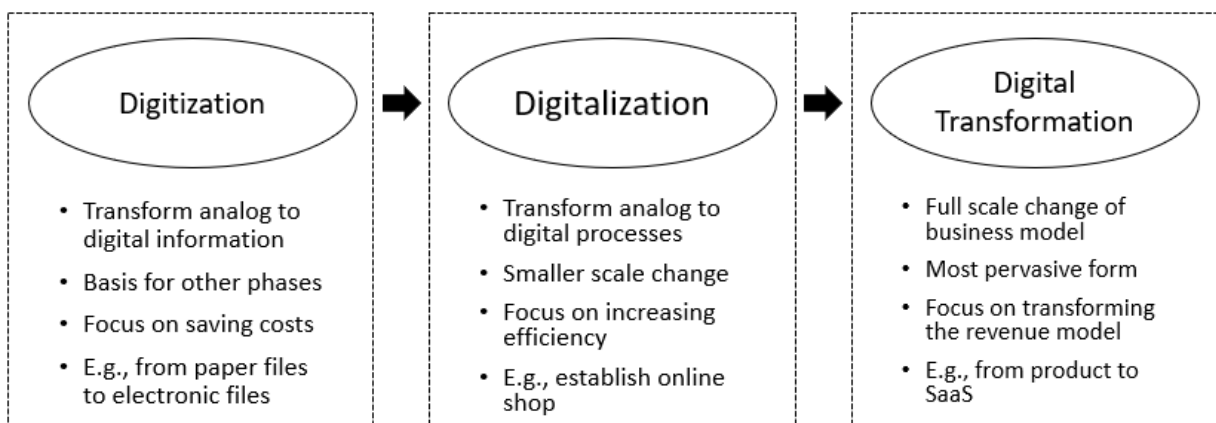
The digital transformation of firms, industries, and society is advancing at an ever-increasing pace. Digital transformation refers to the integration, use, and exploitation of digital technologies to trigger major changes in value creation, appropriation, and delivery. In the past decade, there have been several calls that becoming more digital is imperative to stay future-proof. Finally, the COVID-19 pandemic and the resulting closures of businesses all around the world showed the need for digital infrastructure as online shops and digital businesses navigated comparatively smoothly through the crisis. In contrast, firms that just started on their digital venture had to adopt digital means of communicating and creating value overnight and often struggled in comparison to their more digital competitors. While another pandemic is hopefully decades away, the need to become digital is not going away anytime soon. Hence, digital transformation will remain a key point on the agenda for executives to guarantee that their businesses stay future-proof.

Integrating digital technologies to create an online offering was used by many small to medium enterprises during the worldwide pandemic. From one day to the other, many small firms such as restaurants were cut off from any income stream and managed to switch towards online ordering systems to deliver food to their customers. While this new means of value creation often were not enough to replace the entire income stream, digital technology helped these firms to at least create some income despite being unable to open their doors. Aside from forced digital transformation, there are also more deliberate (digitalization) journeys about local firms.

For example, the German company “*Holzgespür*” offers custom-made dining tables that can be ordered on an online website (Holzgespür, n.d). The company was founded by Julia Kasper, who created it as a branch of the already existing carpentry company of her family. The SME successfully integrated the website for custom-made tables within their existing local (non-digital). As part of the offering, the carpenters do use digital technology not only to get orders but also to connect with the customer and update them on the progress of their ordered products (Storn, n.d.). The new digital branch of the existing carpentry company accounts for a significant share of the income (roughly one-third) and is a prime example of how the integration of digital technology to existing SME companies can create new business opportunities. While it might be debatable whether this counts as full-scale digital transformation, it shows the potential of integrating digital technologies to existing businesses and thus a potential pathway to future digital transformation efforts.

What makes digital transformation both a big opportunity but also a high risk strategy is that it can change the course of the company. If successful, digital transformation can lead to fully new opportunities such as in the case of “*Holzgespür*”. However, if unsuccessful, digital transformation can lead to a company’s demise. Hence, executives nowadays are in jeopardy between transforming to become future-proof on the one hand and risking demise on the other hand. On the bright side, digital transformation is possible and with this book chapter, we try to equip businesses with the latest knowledge from academia, packaged in a way that is easy to grasp and helpful for business.

FIGURE 1
What is digital transformation?



Aside from digital transformation, there are two other relevant and often overlapping concepts: digitization and digitalization (Verhoef et al., 2021). The first term digitization refers to the transformation of analog to digital information and serves as the first phase of digital change. To some degree, digitization reflects the basic necessity for digitalization and digital transformation. In practice, digitization can mean that paper forms are replaced by digital forms such as for employees registering their holiday days in a system.

Second, digitalization refers to changes in (isolated) processes that are becoming digital. Digitalization refers to the second phase of digital change and is for example used to streamline ordering processes for goods, including online shopping as an additional channel or streamline internal process management. Digitalization is often needed as an interim step towards digital transformation.

The third and most pervasive phase of digital change is digital transformation. There are a lot of different and overlapping definitions from academics, businesses, consultants, and other interest groups. For the definition, we draw both on our published work (see Verhoef et al., 2021) and other recent advances from both academia (e.g. Hanelt, Bohnsack, Marz, & Antunes, 2020; Vial, 2019), but also through experience gained through the Groningen Digital Business Center (GDDBC). Thus, for the working definition, we can merge a thorough academic perspective with the necessities for practical use from the business side. This way of defining digital transformation is unique to the way the Groningen Digital Business Center works and helps to tackle the broad meaning and implications it has for business. We define digital transformation as *“a firm’s change in the utilization of digital technologies to create new ways of value creation and appropriation and, thus, to develop a new digital business model”* (Verhoef et al., 2021).

The three definitions together show a clear path on how companies can proceed. When regarded as three phases of digital change (Verhoef et al., 2021), each phase provides different chances and opportunities. While in the first phase, cost saving is the most prevalent objective, it also provides new opportunities to work with the digital data. Moreover the second phase already allows for a wide range of improvements and potential new sources of value creation. In addition, the knowledge gained through these two digital phases allows companies to proceed with full scale digital transformation efforts. As a disclaimer, it must be said that these phases cannot be seen entirely as separate stages but that elements can also overlap and that it is possible (though unlikely) that stages might be skipped entirely.

While technology, as outlined above, plays an important role in digital transformation, it is by no means the sole cause of digital transformation (Verhoef et al., 2021; Vial, 2019). In other words, a company can acquire a range of new technologies, but without the ability to use them in new ways to create value, it is no digital transformation and likely the fastest way towards bankruptcy. While in the old economy (before 1990), the possession and control of unique resources such as machines were key to gain a competitive advantage there is a striking difference today. In the digital economy, most resources are readily and easily available for little to no cost. Even sophisticated AI and machine learning algorithms are freely available. For example, the self-driving mode from in Tesla cars is based to a great degree on open-source Python libraries such as PyTorch or TensorFlow (Sagar, 2019). A disclaimer, the training, and development of an AI is still extremely expensive and time-consuming, but the “technical” ingredients that make these new recipes (i.e., innovations) are readily available. With the right human

capital (e.g. engineers and data scientists) as well as time and training data, everybody could potentially recreate the same technology. Thus, the importance of physical resources – in this case (digital) technology – decreases, while the importance of human capital that handles such technology increases. Thus, digital transformation is about the ability to use technology for value creation and not the technology itself.

What are digital business models

For digital transformation, the important term to discuss is business model change. The term business model refers to the way how a business creates and delivers value to customers and subsequently converts payments to profit. In other words, a business model describes how the company makes money (Teece, 2018). In this sense, thinking about the business model is literally the most important task when thinking about digital transformation and becoming future-proof. Without a solid working business model, a company will sooner or later go bankrupt.

In contrast to established business models, digital business models differ in several key areas. Many of the currently most successful business models would have been impossible to realize without having the right technology available. Imagine a paper shopping catalog trying to imitate the tens of thousands of items of Amazon. This catalog would have been so heavy that no customer would be able to browse through it in a reasonable time. Thus, digital technology (search functionality, virtual product space) is the key enabler of new possibilities to generate value. There are many different digital business models. While some such as platforms are prone to be applied by bigger companies (e.g. platforms), also SMEs must consider how to compete in a digital marketplace. Not only that digital business models are more profitable, but they are also key for SMEs to defend themselves against bigger companies and to stay future-proof.

To provide an overview of some of the most common digital business models, we outline below how these business models work, how profits are generated, and what is unique about them. Besides, we will provide specific examples of firms that operate such business models. This list does not cover every potential digital business model, and each model may not be suited for every company. Sometimes a combination of two, or an addition to the existing business model works best for established companies. Furthermore, it does not cover smaller level additions from digitalization such as webshops. Nonetheless, the list provides an example of how digital technology can be used to fuel the development of new business models.

Table 1.
Overview digital business models

Business Model	Strength	Weakness	Costs and Revenue	Suitability
The freemium model	<i>A potentially large market and large margins if established</i>	<i>Only profitable if a sufficiently large part of customers pays a premium</i>	<i>Sufficient investment required to build a user base for both free and premium product</i>	<i>Suitable for SMEs and multinationals alike</i>
The “free” product or service	<i>Especially for SMEs and startups easy to get started (e.g. affiliate marketing)</i>	<i>A target market needs to be identified and profit requires significant time investment</i>	<i>Potentially low investment required to get started but substantial time (and money) to grow a userbase that generates revenue</i>	<i>More suitable for SMEs or startups</i>
Subscription and/or pay per use	<i>Steady and more predictable income stream</i>	<i>Transition time is costly and time consuming and requires major changes in the business</i>	<i>Moderate investment and revenue opportunities</i>	<i>Suitable for SMEs and multinationals alike</i>
Software/Something as a service (SaaS)	<i>Scalable business model</i>	<i>Customer service is key to establish the business model</i>	<i>Moderate to high costs to establish but steady revenue</i>	<i>Suitable for SMEs and multinationals alike</i>
Moving up or down the value chain	<i>Vertical integration leads to more control over the value chain and potentially a higher share of profit for one company</i>	<i>Time and investment required to cut out the middleman</i>	<i>Moderate to high investment and time required to build necessary capabilities</i>	<i>Suitable for SMEs and multinationals alike</i>
The platform-based business model	<i>Highly scalable, low running costs, and huge profit potential</i>	<i>Requires a sufficiently large user base to be profitable and create value</i>	<i>Huge investment needed to grow market but scalable and highly profitable if large installed bases are established</i>	<i>More suitable to multinationals but also for SMEs and startups in niche markets</i>

1. The freemium model

The freemium business model is characterized by the combination of a free service or product with the option to buy a premium version of the same product or service by paying extra. Here, the company offers a product or service without charge, but customers can buy a premium version of the service for a fee. While the free part of the offering is aimed at getting customers to the website/platform/to the

service, the company often does not earn money with those customers. Henceforth, once customers pay for additional features, the company can make a profit. Research from the video gaming industry demonstrates that the offering has to be of higher value than comparable premium products of competitors to be profitable (Rietveld, 2018). Distinctly for this digital business model is the fact that the marginal (distribution) costs to serve the next customer are close to zero. Once the offering is set, more customers can easily be added. The downside is that this business model relies on considerable market size or needs to operate in a market niche or segment that is big enough to sustain a company (e.g. in the video gaming industry a specific niche such as middle age strategy games).

Dropbox applies the freemium business model. The rudimentary service is for free, yet it allows customers to store additional data and greater sharing and accessing opportunities in the cloud when customers pay a subscription fee. For the free service, the storage space is strongly limited and does not allow the customer to put a lot of data in the cloud. Thus, Dropbox offers different versions of its storage with increasing costs for more storage space. Another Mailchimp in the marketing automation business, which offers a rudimentary service for free but offers premium services with more functionality for a premium.

2. The “free” product or service

There is a saying that nothing comes for free and especially with digital technologies, there are services that users are gonna pay for, one way or the other. In this business model, the firm offers a certain service or product without any charge. Also, there are “no hidden” costs because the entire service is offered without any charge to the customer, unlike the freemium model in which additional functions cost extra (see above). However, in this business model, the company earns money based on at least one of three bases. First, they generate value by using customer data. Second, the firm earns money through ads. Third, they earn money through commission (e.g. affiliate marketing). Sometimes, those models are combined and through the available data more fine-grained offerings are available. There are some costs involved to set up a “free” service or product, but once established the marginal costs of adding additional customers tend towards zero meaning that these business models are extremely scalable.

Clear examples of the free product or service include the search engine Google or social networks such as Facebook, Instagram, or TikTok. In any case, they are offered for free but earn money through using customers' data for advertising. On a smaller scale, web blogs often for niche topics are offered for free and can also earn a substantial amount of money once sufficiently enough users come across the website. For example, the dutch SME Elevar BV with its website 123tinki.nl provides a huge blog archive with nearly any information about dogs. While they do not earn money with the blog, the company provides a price comparison tool for any pet products, which is their main source of revenue.

In other words, the “free” blog gets visitors on the page, and through affiliate marketing (providing a search tool), the company can earn money from commission.

3. Subscription or pay per use

Today, manufacturers shift from the delivery of physical products to but allow customers to use them by paying for the use or availability to the product. Thus, for this business model, companies no longer offer the product but access to the product by charging a monthly fee and/or charge per-use. This model is rather similar to the rent/leasing business model. However, when renting or leasing an item, the contract duration is usually longer than in the subscription/pay per use business model (compare weeks against months or years). The company earns revenues through the service of providing a certain good or service. The upside of this business model is that it does not necessarily require unstable product sales but rather the creation of a stable customer base that purchases regularly. On the downside, a substantial customer base is needed, and enough products need to be available to sustain peak moments. Moreover, the transition towards subscription is time-consuming and costly (Chao, Kiermeier, Roche, Sane, 2017)

Netflix uses this subscription model by charging a monthly fee that allows the user to conveniently access the entire film database at any moment. Carsharing providers also offer access to cars against a fee for the actual use. Moreover, even car companies are beginning to offer subscription models in addition to leasing and selling cars. On a smaller scale, the German startup/SME HelloFresh offers cooking boxes with changing recipes in a subscription model while the Dutch startup Swapfiets offers a bike against a monthly subscription fee. Thus, this business model is interesting for a wide range of companies that want to extend their current product offering.

4. Software/Something as a service (SaaS)

Service-based business models rely on the idea that companies no longer provide a product but replace their product by providing a service that covers the need of their customers. The model's prominent use is in the realm of software where companies no longer provide and sell a disk with a license once to their customer but instead offer their software as a solution that can be used against a fee. While there is some overlap to subscription models, often the SaaS business models are fully developed end-to-end solutions. In the software realm, this means that the SaaS software is accessed remotely and the customer does not need any installation or servers to host the software. In contrast to subscription models, the range of the solution is oftentimes bigger and more used within B2B contexts in contrast to the more customer-focused B2C subscription models. The general idea is to move away from products towards solving customers' problems. Rather than serving off-the-shelf physical products, providers instead offer more customizable services for or solutions to the customer.

Salesforce, a company that charges a monthly fee to allow users to access their full customer management application. Salesforce offers a full-service solution to potential customers. Another example involves IT hardware companies that moved towards offering solutions for example to move the data to the cloud and manage the cloud instead of selling physical server farms. Groningen-based Bossers & Cnossen is an example that transformed from selling and delivering physical products to providing full-service solutions for the clients.

5. Moving up or down the value chain

Organizations can introduce new business models by altering the traditional roles of manufacturers, wholesalers, retailers, and customers. Instead of following the value chain and only selling to the next part, companies that follow this business model use technology to bypass or cut out parties of the value creation. In other words, organizations engage in vertical integration by entering a stage in which they were not active before. Thus, a bigger part of the control and potential profit is concentrated at one company instead of being spread among different companies. While it might be debatable if cutting out the middleman is a business model in and by itself, but with the use of digital technology it was never easier for manufacturers to reach the end consumer without the need for the middleman. The business model provides potential revenue because already existing profit is combined with cost savings due to cutting out a party. On the downside, this strategy might be risky if the middleman possesses specific resources that cannot easily be build such as an extensive network of long-lasting relationships (Broekhuizen, Lampel, & Rietveld, 2013). Hence, while there is potential it does require time or might not even be viable to cut the middleman out.

One major benefit of bypassing parties like wholesalers and retailers through setting up an online shop and selling directly to the end consumer is the opportunity to offer cheaper prices because the middleman no longer needs to be paid. The company gains a bigger share of the profits because it no longer needs to share the profits with other parties. The potential downside is that money needs to be invested to get to the end customers (e.g. getting visible on Google). When organizations succeed, an additional benefit is that it gains more control over the customer experience and can establish close contact with the end customer.

6. The platform-based business model

Platform-based digital business models appear in different shades but at its core, platforms facilitate interaction between different parties such as consumers, producers, and/or third-party actors (Constantinides, Henfridsson, & Parker, 2018). In two-sided markets a platform connects distinct user types like demand and supply. Uber functions as an intermediary and connects buyers (i.e., those who need a ride) and suppliers (i.e., those who can give a ride). Moreover, the company might also create a platform for buyers and sellers and offer their own products (Amazon), or create a platform with its

own products that also allows third-party services (Appstore). In all these cases, the connection between parties is made through a digital interface, like an app or a web portal, or a combination of both. The model can be beneficial cost-wise because often it does not require a large workforce to run the platform. However, investment costs can weigh heavy because a substantive share of the market must be covered to be profitable, and often price wars between competitors can easily kill margins and cause market exits (for example the price war between different food delivery platforms). Lastly, once established, the platform company generates revenue and profits by getting a fixed percentage of the payment for the service. Often these payments make up between 10% - 30% depending on the costs of the good, and the market power of the platform. Hence, the bigger the potential market and the more dominant the company is, the more profit is possible and the harder it is for incumbents and new entrants to fight against this model.

The classic examples for platforms include the large American companies such as Uber, Airbnb, or Amazon that rely to a great degree on venture capital. For that reason, it is oftentimes assumed that this business model is not suited for SME companies. However, also SMEs can create platforms. An example is the German website “*materialrest24.de*” which offers a platform for craftsmen to sell leftover materials (Storn, n.d.). Through this website, craftsmen can either sell material they have leftover or buy material in smaller quantities than usually at wholesale stores. While the craftsmen market might not appeal to American multinationals, it is a prime example of how digital technology can be used to create value by and for small to medium enterprises.

Pitfalls of digital transformation and how to avoid them

Table 2.
Dangers and solutions of digital transformation

Pitfall	Potential Danger	Potential Solution
Organizational structure	<i>Established ways of working often too slow (bureaucratic)</i>	<i>Establish agile working structures to react faster to changes</i>
Organizational culture	<i>Product culture may not be suitable for digital services</i>	<i>Feedback and customer-centric culture needed that promotes openness to digital</i>
Leadership	<i>Without clear direction, resources might be wasted</i>	<i>Establish a digital specialist or leader to champion change</i>
Employee skills and roles	<i>Routine work may be automatized by AI or roles are no longer needed</i>	<i>Focus on human soft skills and retrain employees with online courses</i>
Inertia	<i>Fixed work structures that are hard to change</i>	<i>Establish separate units to learn and expand them slowly</i>

Resistance	<i>Employees may resist change</i>	<i>A combination of leadership, training, and separate units needed</i>
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Digital transformation entails several pitfalls. As digital transformation requires a substantial change in the business to utilize those technologies for new means for value creation, there are important factors to consider. The success of undergoing digital transformation also depends on how well they manage structural changes as well as how they deal with organizational barriers (Vial, 2019). While those concerns may seem more relevant for bigger firms, also SMEs have to deal with several of these dimensions when integrating digital technology within their offering (Storn, n.d.).

First, structural changes are required for digital transformation and those substantially influence how companies might succeed in changing their business model (Vial, 2019). Among those structural changes is organizational structure. One big trend coming from software development to regular project management is the Agile movement. As part of this movement, companies work with faster feedback circles, more interdepartmental collaboration, and the possibility to experiment and end unsuccessful experiments if necessary. These agile methods can also be incorporated in general organizational structure and for example, facilitate the use of cross-departmental teams. In consequence, products are no longer created by engineers alone but through combined input from for example the marketing or IT department. Following organizational structure are changes to organizational culture (Vial, 2019). Especially for an agile way of working but also for cross-departmental collaborations changes in organizational culture are needed. Employees must adapt to a new culture that decreased bureaucracy while increasing agency for each individual. Also, tolerance for failure and admiration for trial and error is deemed important to survive in a fast-paced environment. Lastly, digital needs to become a part of a company's DNA, meaning that everything in the company is entangled with digital technology. While all these changes require a huge change in the organization and can be facilitators for change, they can also hinder change.

➔ **Potential solution:** *From research, we know that organizational structure can be changed relatively quickly (at least on paper). For example, ING bank changed towards an agile way of working within months (McKinsey Quarterly, 2017). However, corresponding changes to culture often happen over years and require a much more long-term view. Moreover, cultural changes also go in hand with instability as well as a part of the workforce leaving. Thus, managers need to be aware that culture can severely hinder digital transformation in their companies. A long-term vision and plan to change culture is needed and often smaller-scale units that operate outside the company's bureaucracy are advised to get started and learn how digitally transform (Tumbas, Berente, & vom Brocke, 2018). Thereby, companies can slowly grow their more digital operations without interrupting or disturbing existing means of value creation.*

The third structural element is leadership (Vial, 2019). Especially in times of crisis strong leadership is needed to rally the organization behind. But leadership also plays a key role in facilitating change when seeking opportunities (Storn, n.d.). Therefore, companies need to provide a strong sense of direction and allocate responsibility to distinct managers. Especially useful in that regard are Chief Digital Officers (CDOs) (Kunisch, Menz, & Langan, 2020). There is strong evidence in the business literature that CDOs can severely impact how companies manage digital transformation by allocating responsibility to key individuals. The use of CDOs will also be later discussed as a potential strategy to deal with digital transformation. Aside from leadership, digital transformation also requires changes to the workforce (Vial, 2019). It is estimated that through technology such as AI, thousands of highly qualified jobs can be partly or fully automated (Dengler & Matthes, 2018). Think along with repetitive work that requires individuals to follow a strict set of rules such as in law or accounting. These tasks currently done by university-educated professionals are increasingly under pressure to be done by AI instead. For example, Flightright developed an AI-powered business model around an EU regulation that allows passengers to get reimbursement from airlines in case their flights are delayed by more than three hours. Instead of employing lawyers to decide whether a claim might be just, they utilize technology to classify claims and can use their workforce instead for court battles for the cases that are winnable (Kaplan, 2019). In turn, companies face immense pressure to reeducate their workforce for the demands of the digital age, and many professions might require a completely different skill set in the coming years.

➔ **Potential solution:** *To guarantee that change is properly executed and that responsibilities are clear, smaller firms can use digital specialists. A digital specialist is broadly defined as somebody responsible for managing digital topics and thus the person to champion change and the first contact person for employees in case of doubt. We found that digital specialists can help to unlock the financial potential of digital transformation by facilitating change and setting clear responsibilities (Fabian, Nguyen, & Broekhuizen, 2021). Moreover, to address changes in roles and skills, companies can use two strategies. First, they can make use of non-traditional ways of upskilling their workforces such as online courses or mini university degrees. These courses allow employees to gain new skills without the need for three-year full-time university programs. On top, while repetitive tasks can be automatized, more time is available for face-to-face client interactions, which opens fully new possibilities for companies to connect with their customers.*

The second organizational barrier deals with inertia to change and resistance to change (Vial, 2019). Inertia and resistance are not limited to large organizations implementing change, but also found within small firms (Storn, n.d). Research on IT implementation shows how employees react to sudden change such as the implementation of new IT. Similar reactions are likely when it comes to digital transformation. The first barrier to change refers to inertia and refers to the difficulty to move and adjust in a changing environment and thus to continue working in a set way. In this regard, firms often have

established long-term relations with their customers and built-up routines to complete tasks, which often impair quick changes. Moreover, inertia is also strongly associated with culture, if the culture is long-established and engrained, employees are more prone to inertia than in rapidly changing environments in which change and evolution are constant. The second barrier to change is resistance by the workforce (Vial, 2019). Workers can resist change passively, actively, but also aggressively, which then turns to open hostility. Previous research on IT implementation shows that resistance is one of the key determinants of project failure. Resistance often originates from individuals and subsequently affect entire teams (Lapointe & Rivard, 2005). Once teams resist, it is hard to counter resistance and get employees to support the change. Hence, managers who want to engage in digital transformation are advised to consider and do their best to mitigate the inhibiting key factor of resistance.

➔ **Potential solution:** *At first, managers need to understand that humans are creatures of habit, thus inertia and resistance are a sign that employees might be overwhelmed. Thus, for established firms, it is often advisable that sufficient time is planned to implement change. Moreover, change should be well communicated, planned and sufficient support for employees needs to be provided. In practice, often firms start the change by establishing separate units that operate outside of company rules and bureaucracy. Through these separate units, learning can be facilitated, and change happens more slowly and organically. Moreover, clear communications and leadership have been found to help employees to adjust to the new situation. Lastly, if new ways of work are required, companies should provide sufficient opportunity to train and prepare the workforce for the change. In this regard, if resistance and criticism start, it is important to devote time and effort to get everyone on board as rooting out resistance on the individual level is much easier compared to at the team level (Lapointe & Rivard, 2005).*

Is it worth it?

One of the key questions for digital transformation, in the end, is whether all the trouble is worth it or that digital transformation might just be another management trend that will pass. There are several answers to that question, but the surmounting evidence suggests that digital transformation is not just a trend that will quickly pass. In essence, digital transformation might even be considered as another industrial revolution and certainly have a long-lasting impact on society. Getting ready for the digital world is essential to become future proof as in the past adjusting to steam, electricity, or telecommunication. Moreover, many companies currently undergo digital transformation and CEOs communicate their effort as a must to be future proof. Thus, in this regard digital transformation is worth it just to level the playing field.

Secondly, digital business models are the cornerstone for several of the most successful companies on the planet. The majority of the American Fortune 500 index with heavyweights such as Facebook, Amazon, Apple, Netflix, or Google or in the Chinese market with players such as Alibaba or Baidu, or

Tencent successfully adopted such digital business models. But also SME firms are transforming their business models. Digital transformation allows new ways for SMEs to create value and connect with their customers. The German website mentioned in the introduction is a prime example on how digital technology enables new means of value creation and opportunities. The digital branch of the carpentry selling custom made tables now contributes roughly one-third of the total profit (Storn, n.d.). Moreover, digital business models and technology ensure survival. The German B2B company WLW (German abbreviation that stands for Who Delivers What) offered a catalog for purchasing industrial goods since 1932. Through digital transformation, they brought their business model to the 21st century and now offer a platform with an integrated search function effectively connecting buyers and suppliers in the market of industrial B2B supplies (Sywottek, n.d.). By implementing major changes to the business model and moving to an intermediary position, the company avoided the threat by big corporations that offered search as part of their business model. Hence, through digital technology, WLW is now able to compete in a digital market and to offer unique value for their customers.

Third, while academic research on the performance implications of digital transformation is still scarce, there is an increasing number of studies that empirically assess whether digital transformation pays off. For example, in our research, we conducted a study on the financial implications of digital transformation and the presence of digital specialists for SME firms (Fabian, Nguyen, & Broekhuizen, 2021). We found that digital specialists in SMEs help firms unlock the financial benefits of digital transformation. A similar observation was made when examining the emergence of Chief Digital Officers in large US firms (Kunisch et al., 2020). These authors found that CDOs have a positive impact on firm performance and help to navigate the tension caused by undergoing digital transformation. Hence, digital transformation is a risky endeavor but the returns are also higher. Research further shows that there are ways to lower the risk and increase the likelihood of success.

In sum, digital transformation is not another trend, it is a necessity to stay future-proof and ready for the next digital decade. Moreover, digital business models have a large profit potential also for smaller firms and allow fully new ways of value creation. Last, undergoing digital transformation is beneficial also in financial terms and firms should not be afraid to undergo the struggle. Given, some firms will fail but if undertaken carefully, digital transformation can be worth the struggle.

Conclusion

This chapter embarked on a journey to investigate what digital transformation is, what its pitfalls are, and whether it is worth it. The goal of this chapter was not to provide a deep academic analysis but rather present recent academic insights comprehensively. Thereby, it makes rigorous and theory-driven academic research accessible for a broader public and aims to help managers make informed decisions about digital transformation. For all the main points raised illustrations and tables were prepared to convey the key points of our analysis.

In the first section, the distinguishment of digital transformation into three phases of digital change is outlined. Namely, (1) digitization that characterizes the transformation from analog to digital information, (2) digitalization to describe the change to digital processes, and (3) digital transformation as full-scale business model transformation. Moreover, the necessity to gain knowledge through these phases and potential overlap is outlined. Subsequently, common digital business models are outlined and explained to provide more basis on how digital transforming the revenue model could look like. Lastly, the key challenges for digital transformation to undergo digital transformation are outlined. This provides a summary of why digital transformation are risky but also worthwhile to pursue.

In conclusion, the chapter provides a short but comprehensive overview of key aspects of digital transformation. Especially the pitfalls and countermeasures might prove useful as they are the key aspects that inhibit value creation and appropriation from digital transformation. We hope that our chapter contributes to the success of digital transformation within your organization.

REFERENCES

- Broekhuizen, T., Lampel, J., & Rietveld, J. 2013. New horizons or a strategic mirage? Artist-led-distribution versus alliance strategy in the video game industry. *Research Policy*, 42(4): 954-964.
- Chao, K., Kiermaier, M., Roche, P., & Sane, N. 2017. Subscription myth busters: What it takes to shift to a recurring-revenue model for hardware and software. Retrieved from <https://www.mckinsey.com/~/media/McKinsey/Industries/Technology%20Media%20and%20Telecommunications/High%20Tech/Our%20Insights/Subscription%20myth%20busters/Subscription-myth-busters-final.pdf>
- Constantinides, P., Henfridsson, O., & Parker, G. G. 2018. Platforms and infrastructures in the digital age. *Information Systems Research*, 29(2): 381-400.
- Dengler, K., & Matthes, B. 2018. The impacts of digital transformation on the labour market: Substitution potentials of occupations in Germany. *Technological Forecasting and Social*

Change, 137(September): 304–316.

- Fabian, N., Nguyen, D. K., & Broekhuizen, T. 2021. Digital transformation and financial performance: Do digital specialists unlock the profit Potential of new digital business models for SMEs? In Hinterhuber, A., Vescovi, T., Checchinato, F. *Managing digital transformation: Understanding the strategic process*. (1st ed). Routledge.
- Ferre, I., 2020. How singles' day compares to black friday and amazon prime day. Retrieved from https://finance.yahoo.com/news/how-singles-day-compares-to-black-friday-and-amazon-prime-day-210545606.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guc e_referrer_sig=AQAAAA0DG9NQ1NZ4CBsoaWAC8faEa4ssJfgFi_vWvwYDn-P6qHCrTNU4t7AI3pW0Y3wzmcuBu2sYb7kxfzlggmbyjfgnI4UJ92EP5WqUsBlXBss9xP8Ke4u_cM3DAaOgFOjzfGPzNI6ppVfIbB7HEDGNmXtI-NtMliLGLzL_1X4UP9j
- Forbes, 2009. Netflix Thrives Despite The Recession. Retrieved from https://www.forbes.com/2009/02/25/netflix-microsoft-blockbuster-personal-finance-investing-ideas_movie_rentals.html?sh=782ccca04897
- Hanelt, A., Bohnsack, R., Marz, D., & Antunes, C. 2020. A systematic review of the literature on digital transformation: Insights and implications for strategy and organizational change. *Journal of Management Studies*. <https://doi.org/10.1111/joms.12639>.
- Holzgespür. N.a. Über uns. Retrieved from <https://www.holzgespuer.de/ueber-uns/>
- Kaplan, A., 2019. European travel disputes are on flightright's legal tech radar. Retrieved from <https://www.abajournal.com/news/article/legal-tech-for-travel-disputes>
- Kunisch, S., Menz, M., & Langan, R. 2020. Chief digital officers: An exploratory analysis of their emergence, nature, and determinants. *Long Range Planning*, 101999.
- Lapointe, L., & Rivard, S. 2005. A multilevel model of resistance to information technology. *MIS Quarterly*, 29(3): 461–491.
- McKinsey Quartly., 2017. INGs agile transformation. Retrieved from <https://www.mckinsey.com/industries/financial-services/our-insights/ings-agile-transformation>
- Rietveld, J. 2018. Creating and capturing value from freemium business models: A demand-side perspective. *Strategic Entrepreneurship Journal*, 12(2): 171-193.
- Sagar, R., 2019. How tesla uses PyTorch. Retrieved from <https://analyticsindiamag.com/tesla-pytorch-self-driving-computer-vision-karpathy-elon-musk-ai/>
- Statista., 2020. Worldwide gross app revenue of the apple app store from 2017 to 2020. Retrieved from <https://www.statista.com/statistics/296226/annual-apple-app-store-revenue/>
- Storn, A. n.d. Analog arbeiten, digital denken. Retrieved from <https://www.brandeins.de/magazine/brand-eins-thema/it-dienstleister-2020/analog-arbeiten-digital-denken>
- Sywottek, C. n.d. Das re-startup. Retrieved from <https://www.brandeins.de/magazine/brand-eins->

wirtschaftsmagazin/2018/service/wer-liefert-was-das-re-start-up

Teece, D. J. 2018. Business models and dynamic capabilities *. *Long Range Planning*, 51(1): 40–49.

Tumbas, S., Berente, N., & vom Brocke, J. 2018. Digital innovation and institutional entrepreneurship: Chief digital officer perspectives on their emerging role. *Journal of Information Technology*, 33: 188-202.

Verhoef, P., Broekhuizen, T. L., Bart, Y., Bhattacharya, A., Dong, J. Q., Fabian, N., & Haeinlein, M. 2021. Digital transformation : A multidisciplinary reflection and research agenda. *Journal of Business Research*, 122(January): 889–901.

Vial, G. 2019. Understanding digital transformation: A review and a research agenda. *Journal of Strategic Information Systems*, 28(2): 118–144.