4

Creating the Conditions for Digital Transformation

The digitalization of products, processes and business models requires flexible IT landscapes, innovation-promoting organizational structures, a digital corporate culture and comprehensive digital competence. By no means are these requirements always met in full, rather they must be created to a greater or lesser extent. The following section describes how this can be achieved. For example, is bimodal IT the perfect solution for embedding new technical solutions created in the context of digital transformation? What benefits do hackathons bring to competence building? And which instruments can help make a company culture digital?

4.1 Prepare IT Landscape: Make Expandability possible

An innovation always includes a technical element. An online service offering, for example from a bank or an airline, typically consists of a client-server solution including an app and a server. Similarly, more automation of a process often requires a so-called workflow management system.

In the simplest case, this is a stand-alone technical solution, i.e. a technical solution that works autonomously and independently of the other technical systems. But this is only very rarely the case. Typically, a new technical solution has to be integrated into the totality of all technical solutions, the IT landscape. The reason for this may be that data is stored on another computer, for example because customer data (reasonably) is stored on a central

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computer. But the reason can also be that other computers offer specific functions, for example for analyzing purchase behavior overnight—in this case too, the new technical solution must be integrated into the IT landscape. In addition, specific technical skills are required to implement new applications, which are still lacking in many companies today and can only be built up in the short term. The following describes why the integration of a new solution into the IT landscape is often a greater challenge and how to assess the two most important concepts for solving this problem.

4.1.1 Why doesn't everything work immediately? The Changeability of IT Landscapes

The realization of an application required for a new product or a new process comprises two steps:

- First, the application must be designed and implemented.
- Then this has to be integrated into the existing IT landscape.

For IT users, the realization of new applications, typically based on innovative technologies, is often a problem. Often, many IT resources are bound to the operation and further development of existing systems. In addition, the paradigms of classical software development often prevail in a company—but these are based on stable requirements for the system and sufficient time for development. Both are often not given in the context of digital transformation. However, new development teams, which may also use new development methods, can usually not be set up quickly.

In addition, the integration of a new application into an existing IT landscape is often a real challenge. Integration requires the definition of which data is to be exchanged between which computers and in which format. This question arises, for example, when computer A contains the address data that computer B needs for issuing invoices. For this case it must be known that the data is stored on computer A and in which format it is stored. This problem would be easy to solve if there were a small amount of data with simple exchange relationships. But both are not typically the case in companies. Rather, there are usually complex IT landscapes that have grown over decades. These consist of a large number of systems that exchange data in the most diverse formats. Often, the fact that many companies do not have

a detailed overview of their system landscape at all makes the situation even more difficult. Over the years, new systems have been integrated and networked with other systems again and again. The clean documentation of these interfaces was often neglected. Projects to simplify the landscape were often avoided.

Below are two approaches to how the topic can be approached if it becomes a real problem in the company.

4.1.2 Bimodal IT as a Solution Approach?

A first possible way to reduce the complexity of an IT landscape and quickly implement new applications is sketched out in the concept of bimodal IT (Haffke et al., 2017). It was developed a few years ago by the analyst house Gartner. The core idea of this concept is to set up a largely separate IT landscape for new solutions and to align the IT organization differently for this and for the existing landscape of legacy systems. This concept thus follows the idea of complexity reduction through separation as well as the improvement of software development through the partial introduction of a new method. In the first (classical) part are the core systems of a company. These should run reliably and cost-effectively. They should be operated and further developed according to the paradigm of "stability and reliability". The systems in the second (new) part often have more experimental, customer-oriented characteristics. Further development takes place here with agile methods. Not infrequently, the projects are risky. Figure 4.1 compares the two approaches.

The traditional approach is appropriate to update an outdated enterprise-wide IT system (e.g., ERP system) or replace it with a modern system, or renew an in-house monolithic application software, such as an invoicing and billing system. Typically, such projects have clear requirements and desired results that are defined and intended for a longer period of time. The agile approach, on the other hand, is more suitable for shorter-lived pilot projects (e.g., IoT projects, Big Data projects) in which a concrete application case only crystallizes during processing and therefore more leeway is required. Also, customer-oriented digital products and services are often developed agilely in order to be able to take customer wishes and feedback from the use of the services (e.g., app) directly into account in the further development of the software.

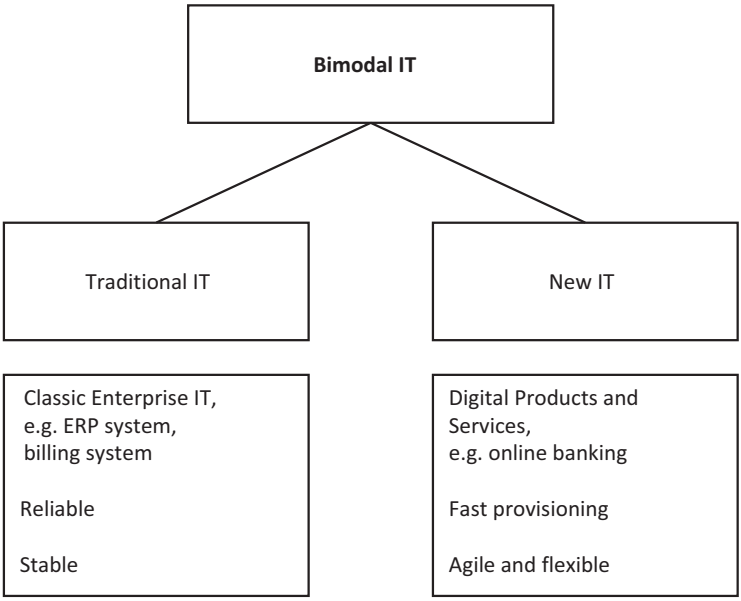

Fig. 4.1 The Two Modes of Bimodal IT

4.1.2.1 Organizational Mapping of Bimodal IT

The two organizational modes of bimodal IT can be differentiated on the basis of their different structures, procedures and risk appetites, as already indicated. Table 4.1 shows clearly that the mode of traditional IT is based on stability and security in the development and operation of IT systems, whereas in agile IT the focus is on agility and speed with regard to new solutions.

- In projects in the traditional mode, the focus is often on the stability of the software and hardware as well as on clean and good data quality. In

Table 4.1 Traditional and Agile IT Comparison (Horlach et al., 2016)

Characteristics	Traditional IT	Agile IT
Goal	Stability and reliability	Innovation and differentiation
Focus	System-centered	User-centered
Planning horizon	Long-term	Short-term
Methods	Plan-driven	Iterative and agile
Development cycles	Long	Short
Development and operation	Strictly separated	Integrated

project management, so-called linear, plan-based development models (such as the waterfall model) are often used, with the advantages of systematic and quality-oriented development, but also with the associated disadvantage of long release cycles.

- The development culture of agile IT, on the other hand, is oriented towards innovation and experimentation. The developers of agile IT solutions often aim for the development of the already mentioned Minimum Viable Product and the rapid testing of their prototypes with the end customer. Agile project management methods, such as the Scrum approach, allow for short release cycles.

The bimodal approach is not without controversy. The following section briefly explains the relevant advantages of the concept and possible risks.

4.1.2.2 Advantages and Disadvantages of the Bimodal Approach

As already indicated, the setup and use of a bimodal IT can be understood as a large lever to create necessary conditions for digital transformation in companies. This allows agile IT in the bimodal concept to provide more effective, active and flexible support for digital business initiatives. In particular, the iterative approach in project management within the agile working mode allows for a high degree of flexibility. This makes it possible to start new projects quickly and develop solutions in short release cycles in order to respond to changing customer requirements. On the other hand, this does not mean that traditional IT properties such as stability, security and efficiency have to be dispensed with. They are still present in the traditional mode.

In contrast to traditional understanding, within the scope of digital transformation, the IT department's goal is only partially to optimize costs and incrementally improve hardware and software. Rather, the goal is to provide the basis for innovative ideas and their implementation. The agile mode makes it possible to create a suitable working environment to promote risk-taking or "trial and error" approaches to creative work and to make faster decisions.

The disadvantage: The establishment of an agile development and operational mode can lead to an internal break in existing processes, and working methods, but also in the task and role distributions. For example, the introduction of a Scrum development approach leads to new roles within a

development team, which are in contrast to the traditional understanding of roles and to hierarchy aspects and can therefore lead to tensions within a team. Also, the strong divergent risk-taking of both approaches can lead to a different tolerance level with regard to the quality of IT products and thus make it more difficult to find a common ground for discussion and consensus between both development units.

When introducing a bimodal IT, not only an "alignment" between IT and business units is necessary, but also a great deal of play between the two different modes of IT organization. Because despite the separation into two working modes, there are still points of contact and dependencies between the agile and the traditional approach, both on a technical and on a personnel level. These can lead to problems within the organization if, for example, innovative or even disruptive solutions cannot simply be connected to the existing traditional IT landscape via an interface.

A critical aspect is also the resource and knowledge management between the two approaches. In part, subject matter experts are assigned to a traditional or agile project depending on the project and expertise. The resulting frequent changes of individual IT professionals between both approaches can lead to conflicts of interest and thus potentially to diminishing motivation of individual employees. Similarly, the continuous use of individual employees in the new IT mode can lead to knowledge gaps with regard to tasks and operations in the traditional IT core and vice versa.

In many companies, bimodal concepts were introduced, often less planned than out of operational pressure. Currently, it is necessary in these companies to connect the two parts of these solutions both technically and personnel-wise and also, especially with regard to development processes, to design them ideally. Not infrequently, such projects are run as support projects in the context of digital transformation. A not inconsiderable part of companies, however, sees the bimodal approach rather critically and is increasingly relying on agile development for their IT projects (Capgemini, 2018).

4.1.3 Cloud Computing as a Solution Approach?

Cloud computing also promises, in addition to reducing the costs of operation and maintenance, a significant reduction in the complexity of an IT landscape and a rapid implementation of new applications. In Sect. 2.3 the concept was already outlined. In its core, cloud computing means that parts of one's own IT system are outsourced to specialized providers in

"small packages"—it is thus a special (granular) form of the long-known and much-practiced IT outsourcing. Like bimodal IT, cloud computing also relies on complexity reduction by separating parts of the IT system, but in a different form. The claim of a quick availability of IT solutions is solved by the provision of standardized solutions and thus quite different from the concept of bimodal IT.

In cloud computing, a service provider provides IT services for a large number of companies and thus benefits from economies of scale. The connection between the own IT systems and the IT systems of the providers is established via interfaces, as is known within an organization. This special form of outsourcing has become possible through the simplified possibilities of coupling the computers of different companies via the Internet (the "cloud"). Technically, cloud computing is based on the principle of virtualization and distribution of IT-based service offerings. It can be described as a model that allows comfortable, demand-oriented, and network-based access to a shared pool of configurable computing resources that can be quickly deployed and released with little administrative effort.

Cloud computing today comes in three forms:

- Software as a Service,
- Platform as a Service,
- Infrastructure as a Service.

1. **Software as a Service** (SaaS) involves the provision of application software over the internet. Application-related services are provided by the cloud provider, who is also responsible for maintaining and operating the software. The software is not installed on the user's device, but on the provider's servers. The user only receives, according to his request, online access, which results in the representation on his device. The management and continuous improvement of the respective applications are left to the provider side. Modern e-commerce systems (e.g. webshops with payment processing) are increasingly being rented from external SaaS providers for a certain period of time, instead of building a website including a webshop internally. In contrast to software that is bought in the form of license fees and usually installed locally in the company (on-premise software), no license fee is usually charged for SaaS. SaaS services are usually rented and paid on a time basis.
2. **Platform as a Service** (PaaS) is an extension of the SaaS concept. This variant also includes the development and execution of software over the

internet. In PaaS environments, it is possible to supplement existing solutions with their own application software or to develop completely new ones. Platforms such as Google App Engine or Windows Azure make it possible to set up development environments including a selection of operating systems, programming languages, technical frameworks and databases independently of location and quickly.

3. **Infrastructure as a Service** (IaaS) means the virtualization of physical hardware. Depending on the demand, a company can be provided with computing power and storage space for different applications. In contrast to the classical IT infrastructure, the offer can be flexibly adapted to the current demand. For example, the access and retrieval of media content from a media library can be "elastic". The user only pays for the actually used computing power. R&D units of a company often use the enormous computing power of an IaaS provider to, for example, perform complex algorithms and simulations in a shorter time.

4.1.3.1 Use of Cloud Solutions by Companies

IaaS solutions make companies more flexible in critical resources such as storage space and can thus save costs. PaaS solutions can make the software development process more efficient. But SaaS solutions are of immediate importance for digital transformation.

SaaS providers can continuously invest in the further development of their solutions. IT users can only do this occasionally. Companies therefore have access to the latest IT solutions in encapsulated form through the use of SaaS solutions. This means that the solutions run by definition at the service provider and only have to be connected to the company's own IT landscape via a standardized interface—which often leads to an old, complex part of the company's own IT landscape being replaced or no new complex partial landscape having to be built up. In sum, the IT landscape of a company loses complexity through the introduction of SaaS solutions—significantly more than with classical standard software.

In addition, the following arguments are put forward for SaaS applications:

- SaaS solutions have a different cost structure. Instead of high investment costs for development or licenses as well as complex server landscapes, there are now periodic constant costs for operation, maintenance and support. In addition, demand (e.g. for work performance) can be adjusted to the current need at any time.

- In many fields, there is a large number of providers. This increases the competitive and quality pressure on SaaS providers. From the user's point of view, this can be expected to result in a continuous adaptation and improvement of the SaaS services. In addition, the fast and easy implementation of extensions and updates on the SaaS provider's side leads to further quality leaps of the offer and the possibility to design corresponding IT solutions in a user-friendly way.
- Furthermore, the use of SaaS solutions enables location-independent use of IT products. Regardless of the geographical location, employees of a company and their customers can access and use the IT services. This results in increasing flexibility for both companies and employees and customers. The relocation of existing IT solutions and their networking in cloud services also creates new value-added services or leaves room to test them in a separate environment, thus supporting companies in terms of their innovation capability.

4.1.3.2 Disadvantages and Risks of Cloud Solutions

The integration of SaaS solutions into the IT landscape entails some risks in addition to the advantages mentioned. Table 4.2 provides an initial overview.

Outsourcing of certain services and data to an external provider implies a certain **dependence relationship** between companies and SaaS providers. Companies give up part of their company-critical resources and knowledge and at the same time run the risk of losing knowledge about company-specific adaptation options for their software.

In addition, there is the **operational risk** that company-critical processes will be impaired if agreed service levels such as availability, performance and interoperability are not achieved. For example, long waiting times or delays in accessing a SaaS-based billing system would unnecessarily delay the

Table 4.2 Risks of SaaS for Companies in Digital Transformation (Benlian & Hess, 2009)

Risks	Short characterization
Strategic risks	Possible loss of company-critical resources through outsourcing to SaaS providers
Financial risks	Hidden or deferred costs from integration effort and additional services
Operational risks	Risk that agreed service levels are not achieved
Security risks	Entrusting critical company data to third parties
Social risks	Outsourcing of applications can lead to resistance within the workforce

billing process of a company and be counterproductive to the goal of possible resource conservation.

Financial risks can arise from hidden costs, such as those that were not finally assessable at the time of conclusion of the contract and only occur during operation. Hidden costs can occur during the integration of the SaaS solution into the existing IT landscape of a company (e.g. commissioning of specialized system integrators), but also when the SaaS provider increases the subscription price over the course of the contract or charges additional costs for services (e.g. mobile access to data).

Furthermore, when using such IT services, a company incurs a certain **security risk**. When transferring internal company data and analysis to an external service provider, the company must have great trust in the provider that the data will be processed, stored and protected safely by this provider. This is especially true for company-critical data.

Despite the risks mentioned, the advantages of cloud services are often seen as outweighing the disadvantages, especially in the context of digital transformation. The gradual use of cloud services is therefore often introduced as a support project for digital transformation (even if other goals are often achieved, such as the aforementioned reduction in IT costs). For example, 66% of companies say that cloud computing is an important step in quickly introducing new applications in the context of digital transformation (bitkom, 2018). In addition, cost advantages are often seen in the operation and maintenance of the systems. It is therefore to be expected that cloud solutions will gradually become an important part of the IT landscape of many companies. Only for very specific applications that cannot be obtained from the market or that should not be given to the outside world, cloud solutions are not an option.

4.1.3.3 Using Cloud Computing for Applications with Private Customers

The problem of integrating new applications, as they arise in the context of digital transformation, primarily affects the IT landscape of the provider—but not only. Often, new applications also have to be installed on the computers of private customers, whether they are stationary or mobile. Cloud computing is also suitable for this, especially in the form of software as a service. Data storage and processing operations take place exclusively with the provider or its service provider. This has been realized, for example, by the Internet services that support the exchange of images.

For end users, the advantages of a cloud solution lie primarily in the fact that they no longer need their own hardware resources for storing data and running application software. The continuous upgrading of storage media and the renewal of computing power lose importance, because both are provided by cloud service providers. In addition, often a rudimentary software in the form of a web browser or a simple client is sufficient to access a cloud service both stationary and on mobile end devices. The central storage and processing simplifiy the exchange and joint editing of, for example, images, music or videos with friends or family members.

Possible risks in the implementation of cloud computing for end users concern—similar to corporate users—above all the areas of security and data protection. The storage and processing of many customer data in one central place can be an interesting target for possible hackers. Therefore, cloud providers invest enormous financial and technical resources to maintain and secure their services.

4.2 Creating Organizational Structures that Facilitate Transformation: Do's and Dont's for Established Companies

In the context of digital change, there are plenty of examples of established companies being displaced, such as the decline of Brockhaus due to the new offering from Wikipedia. Currently, for example, it is the banks that, although they pursue digital visions and roadmaps, do not seem to be sufficiently able to identify innovative ideas early on and turn them into products, for example in the area of payment systems. A key role is played by the organizational structures of the established companies. These are often still focused on the efficient provision and incremental development of their existing products, rather than on the constant development of entirely new products, the business models required for this, and the processes required for their production. Often the problem has already been recognized. For example, a practice study from KPMG from 2016 shows that around 40% of the media companies surveyed consider the establishment of structures that promote innovation to be a very important task in digital transformation (KPMG, 2016). Nevertheless, the answer to the "how" is often lacking. The following section is intended to help with this. It shows which approaches there are to be successful as an established company in generating innovations.

Reference should also be made at this point to Sects. 3.2 and 3.4. There the product-oriented or process-oriented forms of organization are presented, which occasionally flank the creation of digital products or digital processes.

4.2.1 The Dilemma of the (Product) Innovator

Established companies are primarily concerned with incrementally improving their existing products in order to increase their margin. These evolutionary improvements address the needs of existing customers and thus improve the performance of the product. If customer requirements are largely constant, this is a sensible approach. However, if new technologies offer customers completely new and interesting options that are initially apparently irrelevant compared to established requirements, companies do not perceive the products based on these new technologies, because they apparently address a different segment. But if a customer is very convinced by the new product, his preferences change. After a certain time he prefers the new product, the demand for the old product decreases.

Product innovations that trigger this change in customer needs are—as mentioned briefly in Sect. 2.2—referred to as disruptive. Clayton Christensen coined this term (Christensen, 1997). It focuses strongly on changes in customer needs—and thus clearly differentiates a disruptive innovation from a significantly improved satisfaction of largely stable customer needs. Furthermore, he works out the dilemma of the provider, who tries to increase the profit from existing products and services, while on the other hand he is also aware that the customer's needs are changing. A well-known example is the introduction of smartphones a few years ago. As already mentioned in Sect. 2.2 , the first iPhone from Apple can be classified as a disruptive innovation—with it one could rather worse than better phone than with the mobile phone common on the market before, but one could use it as a portable computer.

Another real-world example may illustrate the phenomenon and also lead to a management perspective. In September 2010, the US video rental chain Blockbuster had to close about 6500 stores and file for bankruptcy. In 2010, the then CEO, John Antioco, was also offered the online streaming portal Netflix for US$ 50 million. But he rejected the offer. Today, Netflix has over 100 million streaming customers worldwide, is worth several billion and is the market leader. How did this come about? At first, the service was not interesting enough for Blockbuster customers to make

Blockbuster competitive. Netflix started in 1997 with a DVD shipping service. The founder, Reed Hastings, initially relied on DVD rental by post. But unlike Blockbuster, Netflix reacted early to forecasts and recognized that internet-based video streaming would eventually overtake DVD rental. The reaction of customers and media was initially not very positive. Since 2013, Netflix has recovered and has been growing rapidly since then. Video streaming has become more and more popular, and DVD rental by post has become less and less used. Netflix has successfully avoided an "Innovator's Dilemma" by recognizing the possibilities of the digital business quickly enough and investing in new technologies (Christensen et al., 2015).

Netflix has mastered the challenge. For many other companies this does not apply, they have focused on their established products and have thus ultimately disappeared from the market. These companies had been successful before, had high financial strength and broad knowledge, also about new technologies. So why didn't they invest in disruptive products? Christensen (1997) lists three reasons that contribute to the fact that companies do not make larger investments in disruptive products:

- Disruptive products are initially simpler, cheaper and often have lower margins.
- Disruptive products initially address less important market segments.
- Disruptive products initially often have no benefit for the profitable core customer base.

Although it is not easy for established companies to master disruptive challenges, companies are not helplessly. The first challenge is to recognize disruptive innovations.

One of the best-known approaches to early detection of disruptive innovations is based on a criteria catalog, which differentiates between the view of the established company and the new competitor. In this method, innovations are examined for their disruptive characteristics by means of interviews. Kaltenecker et al. (2013) have used this approach, for example, to check the disruptive characteristics of a cloud-based CRM solution from Salesforce against the established solution from SAP. Table 4.3 shows the result of the analysis from the perspective of SAP, the "Incumbent".

The criteria catalog shown in Table 4.3 is divided into three periods in order to analyze whether the innovation can reach the individual phases of diffusion. If an innovation can make it through all three phases to the end, a disruption is considered to be very likely. For example, in the first phase, an innovation is brought to the market by a new company. This is referred

Table 4.3 Evaluation of a Potentially Disruptive Innovation from the Perspective of an Established Company (Kaltenecker et al., 2013)

Phase	Criterion	Yes	No	Unknown
"Foothold Market Entry"	There are saturated customers	x		
	The main customers reject the new product	x		
	The market for products based on the potential disruptive innovation seems small and irrelevant		x	
Score:		2	1	0
"Main Market Entry"	Established performance features shift	x		
	Customers are not willing to pay for improvements to established performance features			x
	Switching costs are low		x	
Score:		1	1	1
"Failure of Incumbent"	The new products are not offered by the established company		x	
	Established companies flee to premium segments		x	
	The potential disruptive innovation is not realized in a separate organizational unit		x	
Score:		0	3	0
Total rating:		3	5	1

to as the "Foothold Market Entry Phase" because in this time frame the innovation is only demanded by a small, new customer base. The second phase is referred to as the "Main Market Entry Phase". Here it is analyzed whether the innovation can also address the majority of customers of the established market and be successful there. The third phase called "Failure of Incumbent" examines how the established company behaves. All characteristics of the criteria catalog are formulated in a positive way so that, if they can be considered fulfilled, they point to the disruptive potential of an innovation and thus the danger of a disruption. In the present case, it was already apparent at the time of the investigation that the new, cloud-based product has disruptive potential, but that the established company is dealing with this danger in the right way. This has also been confirmed in the aftermath.

4.2.2 Setting up a Digitalization Unit

Classic corporate structures are not necessarily conducive to innovation, as there are often firmly anchored roles and responsibilities, and often thinking is not done across departmental or even corporate boundaries. In addition, complex and lengthy processes, as well as a cumbersome corporate culture, make it difficult to explore new ways. Innovative employees with digital expertise are difficult to win and retain, often feeling that ideas are nipped in the bud. Changing the core organization fundamentally requires a lot of time, if it succeeds at all. Separating innovative activities is therefore an interesting approach that can support the development and implementation of digital innovations (Ebers, 2016). The idea behind this is that new ideas are not rejected as quickly when there is less internal competition for the existing business due to the independence of the organizational units.

The separation of innovation activities into partially autonomous units can also be seen as a response to the innovation dilemma described above. In established companies, disruptive innovations are often not taken into account because they do not generate quick profits and are often unprofitable at the beginning. As a result, evolutionary innovations are usually promoted in these companies. These companies should establish independent organizational units that are responsible for exploratory tasks, that is, for the development and implementation of innovations. The ability to adapt quickly and flexibly to changing environmental conditions is considered to be particularly pronounced in autonomous units. Independent organizational units should enable a faster detection of potential disruptive innovations, as these units can work with different goals than the existing business; they do not have to prioritize quick and profitable projects at the beginning over disruptive innovations. This concept can also prevent conflicts in terms of resource allocation. This makes it easier for employees to take initiative, go down unfamiliar paths, trigger discovery processes, and use innovative knowledge.

Digitalization units (also referred to as digital innovation units) can be seen as a form of these (partially) autonomous organizational units in which digital innovation activities are separated. in With these units, different objectives can be pursued, each of which requires different design forms (Fuchs et al., 2019; Barthel et al., 2020).

4.2.2.1 Objectives and Types of Digitalization Units

The main objective of digitalization units is basically the development of digital innovations. However, secondary objectives such as driving a culture change or building digital expertise can also be pursued. The innovation activities can have either an internal focus on business processes or an external focus on products, services, and business models. With an external focus, it can be further distinguished whether existing business fields are to be further developed or entirely new fields are to be opened up. The target of a digitalization unit is also defined by which steps it is to take in the innovation process. Is it only about generating and selecting ideas? Should the unit develop and implement the innovations itself? Does the unit also take over the marketing of the innovations? With these central parameters, the target of a digitalization unit can be defined.

Roughly, three types of digitalization units can be distinguished, with which different objectives can be pursued (Barthel et al., 2020).

Type 1, the "internal facilitator", is mainly concerned with innovations that concern the internal organization, such as business process innovations. He therefore has a very strong focus on what is already there and is looking for ways to transform the existing organization. Occasionally, a product or service innovation may also be sought, but only as a secondary result. The main task of these units is to collect or generate project ideas, develop process innovations, and then return them to the departments responsible for the implementation of the innovations. An example of type 1 would be the digitalization unit of a large bank, which, among other things, develops, tests, and implements new concepts for the internal business processes in human resources in order to explore new ways of talent acquisition and employee development.

Type 2, the "external enhancer", is concerned with the development of new digital products, services and business models and therefore has a stronger market orientation. Units of this type focus on innovations in existing business fields, i.e. they usually want to address existing customer groups. As with type 1, these units therefore transform the existing organization, but primarily target products and not internal processes. The tasks of these units include the generation and selection of innovation ideas and the development of prototypes. The marketing of innovations is then usually carried out again in the core organization. For example, the type 2 digitalization unit of a tool retailer and manufacturer develops personalized digital services for its B2B customers so that they can recognize the procurement

need at an early stage and thus optimize their tool ordering and storage processes.

Type 3, the "external creator", develops new products, services and business models like units of type 2. However, in contrast to type 2, these units focus on innovations in new business fields, i.e. they want to address new customer groups and create entirely new business opportunities. These units often cover the entire innovation process, i.e. they start with idea finding and selection and then market the developed solutions themselves. The digitalization unit of a chemical company, which brings users together with local car workshops for the provision of repair services, could be mentioned as an example. The associated business model is independent of the core business of the company, but fits into the overall ecosystem (the chemical company also manufactures car paints).

Table 4.4 shows a comparison of the three types at a glance.

Which of the three types is chosen has a huge impact on the concrete design of a digitalization unit, which we will look at in the next section. Units of type 1 are usually conducted as close to the core organization as possible, since their innovation focus is also on the transformation of the core organization. Units of type 3 are usually given a lot of freedom so that they can explore new paths completely unhindered by the core business. With units of type 2, a middle way is taken.

A warning should be issued at this point. In various studies, we see that many digitalization units were founded "because one apparently does this when one wants to digitalize". Companies therefore observe, for example, that corresponding units are founded by competitors and then feel under pressure to follow suit. However, they have usually not thought much about the specific objectives of the newly founded units. This is strongly

Table 4.4 The Three basic Types of Digitalization Units (Barthel et al., 2020)

Type	Orientation	Coverage of the innovation process
Type 1, the "internal facilitator"	Internal, existing organization	• Generating and selecting ideas • Innovation development
Type 2, the "external enhancer"	External, existing business fields	• Generating and selecting ideas • Development of innovations • Partial implementation and marketing of innovations
Type 3, "external creator"	External, new business areas	• Generating and selecting ideas • Developing and implementing innovations • Partially marketing innovations

discouraged. Units that are founded without a clear purpose are often doomed to (expensive) failure. In the worst case, the acceptance of digitalization topics in the entire company then decreases and the opposite of what was intended is achieved. Therefore, before a company founds a digitalization unit, it should define clear goals (which may change over time) as far as possible and then decide on the appropriate design of the unit.

4.2.2.2 Design of Digitalization Units

As already mentioned, the design of a digitalization unit must match its objectives. In principle, different parameters influence how closely or loosely a digitalization unit is coupled to the existing core organization.

The selection of employees (**Staffing**) for the digitalization unit can either take place from the existing core organization or new employees can be recruited from outside the company. For the projects themselves, it must also be decided to what extent employees of the core organization, employees of the digitalization unit or external partners are involved. It is generally assumed that the involvement of existing employees leads to a closer coupling and the recruitment of external employees leads to a looser coupling.

The next central question arises with respect to the **budget**. Who provides the digitalization unit with financial resources and in what amount? Is the budget provided centrally or is there decentralized financing from several departments? Is there internal performance billing and/or does the unit generate its own sales? It is obvious that a digitalization unit that finances itself has, as a rule, more freedom than a unit that is perceived as a pure cost factor.

The question of the **location** should not be underestimated either. Especially during the first emergence of digitalization units, the impression arose that it would be advantageous to sit as far away from the core organization as possible, preferably in places with a strong start-up scene like Berlin. Meanwhile, however, many units seem to be moving more towards being located near the headquarters, but in their own premises.

In addition, numerous other decisions have to be made with regard to the **degree of freedom granted and the embedding** of the units. Is the digitalization unit legally independent, is it run as a staff unit or is it embedded in the line organization? Can the digitalization unit autonomously decide which projects it prioritizes? How often is the core organization reported to

and to whom? Do managers of the core organization have direct access to employees of the digitalization unit?

Here it is necessary to weigh up carefully. If a unit is too closely linked to the core organization, this takes away the freedom for innovation from the unit, the basic idea of separating innovation activities is thus ultimately carried to absurdity. Instead of setting up a digitalization unit, the innovation activities could just as well be fully integrated. If a unit is too loosely coupled, the core organization cannot control the unit and cannot ensure that the solutions developed for the core organization also create value, for example by complementing the existing product portfolio in a meaningful way or creating attractive, future-oriented new business areas. The goal of making the core organization itself more innovative in the long term through exchange with the digitalization unit can also hardly be achieved in this case. In this case, a complete spin-off would probably be the more consistent variant. So there can be no general statements that one side (close or loose coupling) is always better than the other. However, the types mentioned above give indications of which side should be given more emphasis depending on the target direction.

Design of the Central Digitalization Unit in a Chemical Company

The digitalization unit of a large German chemical company deals with a variety of externally oriented innovation activities, including the enrichment of existing business fields with digital products and services, but also the development and implementation of digital products and business models for entirely new markets (Fuchs et al., 2019). Accordingly, the digitalization unit can be considered a combination of Type 2 and Type 3. The foundation of the unit took place as part of the digitalization strategy decided by the management. The digitalization unit is headed by the CDO of the core organization, which emphasizes its strategic importance. The unit is legally independent and is run as a limited liability company. Although its budget comes from central funds, it also has its own responsibility for profits and can reinvest the revenues it generates in its own projects. Accordingly, the unit also decides on its own project portfolio. The unit's location is near the corporate headquarters, but in its own premises. The design of the unit reflects its goals very well, both to enrich existing business fields digitally, but also to develop new business fields independently.

4.2.2.3 Add-on: Ambidexterity as an Abstract Ability of a Company

Ambidexterity describes in an abstract form the ability of companies to exploit new business areas (exploration) in parallel to the established business (exploitation). In the context of digital transformation, this ability can mean that companies successfully develop innovative digital business models while simultaneously successfully continuing their existing (non-digital) business. The relevant research has shown that there are different forms of ambidexterity (Holotiuk & Beimborn, 2019; O'Reilly & Tushman, 2011). If a company operates its exploitative existing and exploratory new businesses in separate organizational units, this form of ambidexterity is called **structural ambidexterity**. The company divides innovative businesses into autonomous units. This approach can be found, for example, in the previously described creation of (partially) autonomous digitalization units. In addition, there is the approach of **contextual ambidexterity**. Here, employees are given the opportunity to divide their working time freely between exploration and exploitation on an individual basis. Explorative and exploitative activities take place in the same business units, there is no structural separation. Here, the responsibility for innovation lies with the existing business. As a special form of this, **temporal ambidexterity** can be seen, in which employees are allowed to work full-time in exploratory units for a limited period of time, before returning to the established core business. Finally, **sequential ambidexterity** will be discussed. It is assumed here that the entire company alternately goes through cycles of exploration and exploitation. This form of ambidexterity has a very long-term perspective, as it requires "switching" and restructuring the entire organization each time. Therefore, it is questionable whether this approach is suitable for the dynamic context of digital transformation.

4.2.3 Collaboration with Start-ups as an Opportunity for Innovation in Digital Transformation

Digital transformation requires agility, technical innovation and a new approach to risks. However, many established companies lack the internal expertise and structures to meet these requirements and adapt their business model accordingly. One possible solution to this innovation dilemma (see Sect. 4.2.1) and thus a potential alternative to setting up one's own digitalization unit (see Sect. 4.2.2), at least for larger companies, is collaboration

with start-ups. This allows established companies to have faster access to digital innovations and to benefit from the creativity and agility of young companies. In addition, this collaborative approach can reduce the later endangerment of one's own business model, as each start-up can also potentially become a competitor. From the start-up's point of view, collaboration with a large, established company can enable access to complementary and otherwise unavailable resources, such as customers, image or technology. Given this apparent win-win situation, it is not surprising that approximately 70% of all start-ups in the European Union work with an established company (Schleef et al., 2020).

Such collaboration entails a multitude of opportunities and challenges that arise from the asymmetry between the parties involved. Therefore, this section discusses the various possibilities for collaboration, such as corporate venturing, after a short characterization of start-ups. After a comparison of the advantages and disadvantages, a decision model is finally presented that can support companies in their considerations.

4.2.3.1 Characterization of Start-ups

In order to be able to evaluate a possible start-up collaboration, companies should first know the basic characteristics of start-ups. These are defined as "young commercial enterprises that were founded no more than five years ago, whose founders are employed full-time, have a founding team or employees and are innovation-oriented or growth-oriented, i.e. they carry out research and development in order to bring a technological innovation to market maturity, or offer at least one […] market novelty" (Metzger, 2020). The number of these young companies in Germany has stabilized in recent years. After the increases in 2017 and 2018, the number of start-ups remained at 70,000 in 2019 (Metzger, 2020). Among the most successful start-ups of recent years in the German-speaking world are (as of 2021) N26 (direct banking app), Horizn Studios (luggage with technical features), Holidu (search engine for vacation homes) and Celonis (process mining software).

The evolution of a start-up can be divided into different phases, which are often not clearly separated from each other and of different duration. In addition, not every startup necessarily goes through every phase. Ideally, the phases idea, foundation, growth and maturity can be distinguished. In the **idea phase** the so-called "market-fit" of the startup is developed. The focus is on the problem to be solved and the implementability of the idea, which

is then transferred into a viable business model. Depending on the founding idea, the first prototype or a minimum viable product (MVP) is often created here. Under certain circumstances, revenues can already be generated by first customers. The **foundation** marks an important milestone in the evolution of a startup, because, among other things, the choice of legal form and the entry in the commercial register take place here. In these early phases, successful (tech) startups sometimes already collect subsidies from business angels or other early-phase investors of up to 0.5 million €. In the **growth phase** the start-up is then further developed and the product or service is established on the market. Especially promising tech startups with highly scalable business models (allow for fast and cost-effective expansion) can hope for investments from venture capital companies in the millions here. The growth is increasingly forced, investments are made and further expertise is obtained in order to gain market share. In the **maturity phase** the business model has finally been established and the company is prepared for a sustainable future, possibly the portfolio is expanded.

The success of a startup is initially largely dependent on the **founder's personality**. Successful founders often have special skills and character traits, such as innovative spirit and risk affinity. In addition, there are various measures for evaluating the success of a startup. The first important milestone is the founding of the company after the idea and planning phase, as well as the duration on the market. The "hard" key figures, which are relevant for an investment participation, include growth figures such as sales and number of customers or employees. Profitability only becomes relevant later. In the case of B2B software startups, for example, it is assumed that the achievement of the first ten paying customers marks a substantial milestone for the raising of investment funds and from here a significantly higher company valuation is possible. Many start-ups therefore try to develop a first MVP with little seed capital or purely with the founders' own resources (so-called bootstrapping) and to win customers before institutional investors are involved.

Established companies have different ways of working with start-ups. In addition to company hackathons (see also Sect. 5.2.3), in which start-ups have to work on innovation challenges in a given time frame, accelerator and incubator programs, as well as corporate venturing are possible forms of cooperation, which should be examined in more detail in the following. Figure 4.2 gives a first rough overview.

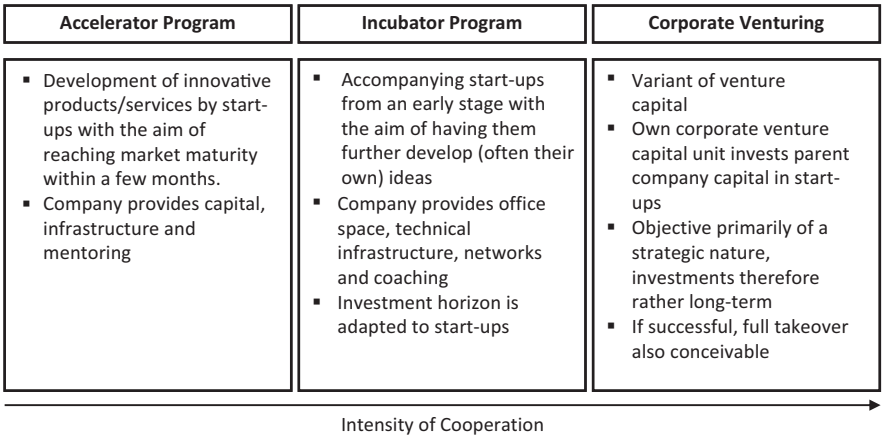

Fig. 4.2 Possible Forms of Cooperation between Companies and Start-Ups

4.2.3.2 Accelerator and Incubator Programs

In recent years, accelerator and incubator programs have established themselves as popular practices for efficiency gains, access to technology and promotion of innovative work practices in companies. Since the terms are often used synonymously in practice, the programs should be presented and delimited below.

The so-called **Accelerator Programs** are programs with a duration of often three to four months, in which companies make start-ups capital in five-figure range, as well as infrastructure and mentoring available. In the shortest possible time, the start-ups should develop products that can be presented to investors at the end of the program. In return for the support, the companies receive a stake in the start-up. To be able to participate in such programs, founders' teams must apply to the companies and present their idea.

In addition, companies have the opportunity to establish so-called **Incubator Programs**. Incubators are facilities that accompany start-ups on the way to set up a company and support them throughout the entire life cycle. In contrast to accelerator programs, the start-up's business idea is still in its early stages and is refined during the course of the program. Often, the established company also brings its own ideas, which are then further developed by start-ups in a safe environment. In these "start-up incubators", companies offer start-ups rental space as office space, make technical infrastructure available, help to form networks and coach in setting up a company. Start-up financing is also possible, partly in exchange for company

shares. Overall, the cooperation between companies and start-ups is more intense in incubator programs than in accelerator programs.

Examples of these programs are the Deutsche Telekom's technology incubator hub:raum, which supports early-stage start-ups in the technology sector; or ProSiebenSat.1's accelerator program, under which TV and digital media budgets are invested in promising, mass-market-ready product ideas (as of 2021). Companies can also join networks in this context, e.g. the Start-up Bootcamp with 140 partners, including Intel, Vodafone and Allianz.

Success factors for such programs include, for example,

- Industry focus
- Strong network of investors, customers, suppliers, mentors and partners
- Management team with experience in founding
- Sufficient capitalization
- Appropriate location (e.g. near universities and research institutions)
- Top-level commitment
- Internal marketing to create acceptance within the established company

However, when deciding on the establishment of such a program, companies should take into account the fact that they are not uncontroversial among founders. Reasons for this include unfulfilled promises of care or, on the other hand, too much influence. Companies also have to expect that start-ups with really innovative business ideas will turn directly to venture capitalists. In order to avoid this "mismatch", companies should make sure that these programs are not only designed along their own needs and also require a certain risk affinity.

4.2.3.3 Corporate Venturing

When it comes to **corporate venturing**, this refers to "an attempt by large companies to replicate the properties of small and young companies that are significant for innovative activities and to combine them with their own strengths such as market power and financial resources" (Gruber & Henkel, 2005, p. 139). A well-known example is the Siri language assistant from Apple, which was not developed by the technology giant itself, but by a start-up called Siri Inc., from which Apple bought all rights to the

product. For the realization of such investments, established companies have the opportunity to set up their own corporate venture capital unit (**CVC unit**) (Klamar & Prawetz, 2018). These CVC units are often implemented as independent units within the companies, exclusively provided with capital and have the necessary flexibility and speed to compete in the venture capital market. These arms operate similarly to traditional venture capital firms (e.g. Project A Ventures, Unternehmertum, Global Founders Capital; as of 2021), but do not invest the money of various investors, but only that of the parent company. Measured by the number of registered patents, these CVC units are up to four times more successful than the "competing" internal research and development departments of established companies (Klamar & Prawetz, 2018). Of course, the start-up's contribution to increasing corporate value is also counted. In the case of successful investments, a complete takeover or merger is also possible. In addition to the variant of participating in existing ventures, corporate venturing is often also understood as an "inside-out" variant, whereby companies themselves set up start-ups (with up to 100% equity in their own hands), which are then sold, for example, at a later stage.

In contrast to this **external corporate venturing**, venture activities can also be carried out within one's own company. **Internal corporate venturing** focuses on the development of new products/business models within the company's boundaries. Venture capital is thus only made available to the employees of the respective company with the aim of increasing the company's innovation power and motivation and accelerating the founding of new business areas. Although this approach often provides a short-term boost to innovation activities, it cannot keep up with the external variant in the long term due to corporate structures and is therefore not further considered here.

Since the opening of the first corporate venture fund in the 1960s, companies in the fields of technology, pharmaceuticals and telecommunications have been active in this market. However, in the age of digital transformation, companies from other sectors are also well advised to at least evaluate the advantages of corporate venturing for themselves. Established companies thus gain innovation power, technology competence and agility, while the start-up gains financial performance and market access. These opportunities are offset by challenges resulting from the symbiosis of two different market participants, which will be examined in more detail below.

4.2.3.4 Cooperation with a Start-up—Yes or No?

The success of a corporate venture collaboration arises from the combination of the advantages of the established company and the start-up (Schleef et al., 2020). The companies can provide financial resources and have efficient production capacities as well as general know-how, credibility and market access. In contrast, start-ups bring agility, innovation and expertise in new digital technologies (Rothaermel, 2001). The opportunities and challenges for the established company in such a cooperation are shown in Table 4.5.

If you take a look at successful CVC units, they show the following practices (Basu et al., 2016):

- Minimizing contract complexity and protecting the interests of founders increases the reputation of the CVC unit as an attractive and integrated partner, which leads to a higher number of investment opportunities and thus to higher search efficiency
- An investment in the early stages allows for the realization of competitive advantages, as access to future-oriented technologies takes place before the competition
- The development of a collaboration plan before the transaction with the start-up creates a mutual sense of duty and drives integration forward
- By avoiding competition with existing departments, resistance to the CVC unit and to the start-ups is reduced

In view of the advantages and disadvantages as well as success factors mentioned, the question arises as to whether and when an established company

Table 4.5 Opportunities and Challenges of Corporate Venturing for Companies

Opportunities	Challenges
• "Window on Technology" (access to start-ups and the scene in general) • Generating knowledge about new markets and business areas and the resulting growth opportunities • Saving own R&D costs • Faster reaction to new developments • Marketing effect/reputation • Chance of cultural change through contact with start-up culture • Access to new customer groups or knowledge about own end customers (e.g. Flaschenpost acquisition by Dr. Oetker)	• Identification of the right start-up • Complex acquisition processes (can take as long as setting up one's own start-up in doubt) • Integration of the start-up (different cultures and working methods) • Keeping the founders/start-up employees within the established corporate culture • High premiums/multiples for equity investments

should enter into a venture with a start-up. While this question of course depends on the individual case, answering the questions posed in Fig. 4.3 can help companies make the decision.

In **exploratory projects**, established companies typically look for digital know-how and creativity, which young companies usually bring with them. Business competence and absolute customer orientation are also often required here. In targeted projects, a careful assessment is required as to which other competencies and partners are needed. If there is no final business case yet and the project is in the **conceptual phase**, young companies can also be useful in this phase through innovative problem-solving skills. For projects that require greater **implementation capacity** (e.g. for system integration, but also for production and delivery), start-ups may fit less into the profile and cooperation with other established companies could be more advantageous. If the company intends to outsource the **project management responsibility**, start-ups in later phases (so-called scale-ups) are more experienced and therefore better suited than early-stage start-ups.

It becomes clear that cooperation with start-ups should be initiated at the beginning of the innovation process. Once the digital transformation project has left the conceptual phase, start-ups can no longer play their strengths to the same extent. Companies therefore have to carefully consider whether and when to enter into a cooperation with a start-up. These considerations should take into account the project status and the skills required to advance the project. In addition to the digital competence, which is obviously at the heart of the digitalisation, in particular the aspects of solution and project

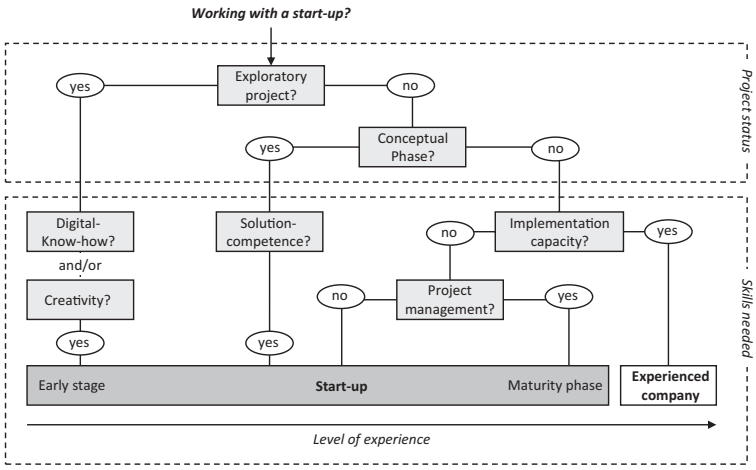

Fig. 4.3 Decision Model (based on Hogenhuis et al., 2016)

management competence must not be neglected. The basic attitude of the management of the company towards start-ups and its risk appetite are also not to be underestimated. Investment decisions are often made quickly and under incomplete information, so that it is more a matter of managing the start-up well than of making a watertight decision on the basis of fixed criteria. In order to "test" the potential of such a cooperation in advance, there is also the possibility of entering into a supply partnership with the start-up. This partnering can be more attractive than a direct investment, as sales are generated. In the event of a positive outcome, the company may possibly participate in the start-up later.

Finally, it should be noted that cooperation with a start-up in order to strengthen digital competence requires a rethink in established companies. Such projects often fail due to insufficient conception and an unclear mandate from management. The CVC unit should be integrated into the company in a sound manner and it should be ensured that existing employees do not feel threatened by their activities and have an appropriate open attitude. In addition, a sufficiently strong strategic fit between the company and the start-up is central in order for cooperation with start-ups to really offer an innovation opportunity in digital transformation.

4.3 Transforming Corporate Culture: A Tough Challenge

Corporate culture reflects the "personality" of a company, so to speak the DNA of the company, which makes it unique and thus represents a competitive advantage. However, the ambivalence of this competitive advantage becomes particularly apparent in comprehensive transformation processes: In the best case, corporate culture acts unnoticed as a catalyst, i.e. as a lubricant, which allows the company to drive and support the transformation. More often, however, corporate culture makes itself felt as a rigid structure that impedes transformation processes and often chokes them off at the root.

But what is corporate culture at all? What role does it play in digital transformation? Which corporate culture is adequate to master digital transformation, and with which approaches and which procedure can culture be changed specifically in the transformation process? These and other resulting questions will be answered in the following section.

4.3.1 What is Corporate Culture?

Edgar H. Schein's three-level model (2010) provides a simple and understandable model to make culture tangible (see Fig. 4.4). The model is often represented graphically as an iceberg to emphasize the distinction between visible and invisible culture elements.

At the top of the iceberg are the so-called **artifacts**—visible elements that allow a first conclusion to be drawn about the culture underlying them. Such artifacts are diverse and range from formal cultural manifestos such as the communicated corporate philosophy, annual reports or products of a company to the "look & feel" of the offices, the dress code, the address of colleagues to organizational symbols or internal company myths and legends. Here one of the problems of an artifact-centered understanding of culture becomes apparent: Although artifacts are easily accessible because they are visible; however, an understanding of the underlying assumptions is necessary for their correct interpretation. So the morality of internal company myths may be obvious to the members of the company, but externals will have a harder time interpreting it without knowledge of the context and the understanding of values, and may even come to quite different conclusions.

Beneath the surface lies the second level of culture of a company (and generally of any organization), which is no longer directly visible, but can still be guessed. This level consists of **collective values** (norms and philosophies) which are considered ideal by the members of the organization and thus influence their behavior. This understanding reveals another property

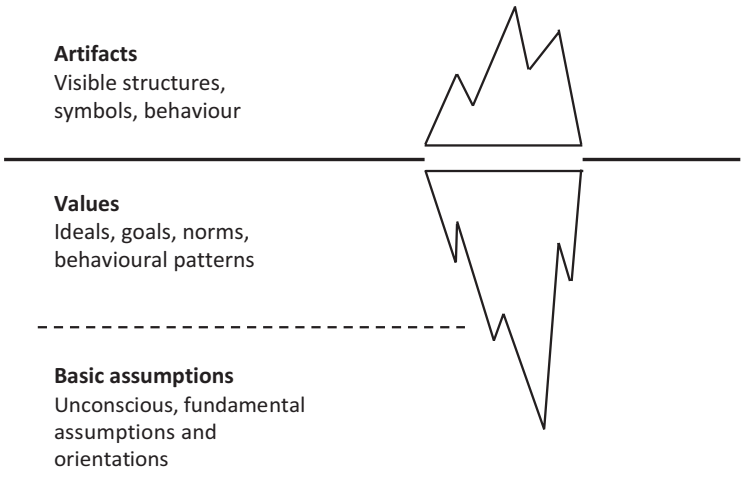

Fig. 4.4 Schein's Culture Model (2010)

of culture: Culture is always a shared, common understanding of what is considered important and desirable by several individuals. However, this understanding does not necessarily have to be shared by the whole company. Within an organization, there can certainly be different, sometimes contradictory value systems of individual subcultures. However, these usually overlap at least in the basic assumptions, the third level of culture.

Basic assumptions are deeply rooted assumptions that have become self-evident over time and are no longer questioned. These implicit, subconscious assumptions about values and ideal procedures, similar to the majority of an iceberg, can hardly be guessed. However, they decisively influence the actions of organization members, their perception and thinking, and form the very context in which artifacts must be interpreted. Historically, basic assumptions arise from values that have proven themselves over time and have become increasingly self-evident.

This reflects a significant point: culture is not a static structure, but a growing, evolving system. In the early stages of an organization, its culture is strongly influenced by the founders. The personalities, values, ideals and visions of the founders shape the cooperation and culture in the just-emerging organization. Newcomers find in the organization an increasingly solidified set of rules of accepted and expected behavior to which they must adapt. Over time, experience and learning effects play an increasingly shaping role. Therefore, culture is often defined as an expected pattern of behavior expected of a group, consisting of action strategies that have proven to be successful problem-solving patterns in the past. These learned patterns of behavior now set the expectations for future behavior and thus serve as a rulebook with regard to what is considered correct behavior and approach to problems.

The justification for past success explains in principle why it is so difficult to the change culture. Statements like "we've always done it that way" are only the manifestation of a much deeper problem: the internalization of behavior. While successful action strategies initially served only as orientation for future behavior, they solidify with continued success to "normal" and self-evident behavior—that is, they develop increasingly into expected, idealized behavior that manifests itself as a value of a group. Since these are implicit cultural elements, the members of an organization are not necessarily aware of their value-determined expectations, which is why their influence on behavior is much more difficult to grasp and change than just the pattern of a "we've always done it that way". In summary, it can be said that the culture of an organization is shaped by its founders or other role

models and consists of internalized patterns of behavior of the members of the organization.

How strongly corporate culture influences the actions of its members or how uniformly values are represented within an organization depends, on the one hand, on the strength and clarity of the values and visions lived by the leaders. On the other hand, the strength of culture has a temporal dimension: its influence is all the stronger, the more stable a group is in itself, the longer it has already existed and the closer the group members work together, that is, exchange common experiences. Culture does not have to be uniform across the entire organization. As already mentioned above, subcultures with divergent value systems can exist within an organization, which have developed, for example, due to different task requirements or professional backgrounds. It is quite conceivable that the subculture in a controlling department focuses much more on a guideline-oriented and minutely documented way of working than the subculture in the graphics department of the same company, which is likely to support creativity and deviation from the norm. But both subcultures can have common values and basic assumptions that are shared throughout the organization—so to speak, the intersection of subcultures, which makes up the core of corporate culture, the DNA of the company.

4.3.2 Adequate Culture for Digital Transformation

Corporate culture plays a key role in the digital transformation of companies, culture significantly affects the success of digitalization measures and thus ultimately the success of transformation into a digital company. According to a survey by Capgemini (Schaefer et al., 2017), in 2017 more than half of the companies surveyed cited culture as the biggest obstacle to successful digital transformation. It is therefore not surprising that both in various practice studies and in the press as well as within the companies themselves, the call for a necessary cultural change is loud. And quite rightly: Comprehensive transformation measures, such as those necessary in the course of the digital transformation of companies, are doomed to failure without a supportive corporate culture as a basis. In order to fully exploit the potential of new technologies, it is not enough to implement them in the company through new products, processes and business models—even the best technologies only work if the employees know how to deal with them, what they are for and how the resulting possibilities can be perceived. The introduction of a new communication system to promote

cross-departmental cooperation in a siloed work supporting culture without corresponding accompanying change measures is wasted money. Innovation competitions will remain unused as long as the respective corporate culture does not promote innovation as a desirable ideal.

4.3.2.1 Resilient Organizations as Cultural Role Models

In connection with the call for a cultural change, the ideal image of a digital culture is often evoked, but mostly without defining it more precisely. So what does this digital culture look like, which represents an adequate corporate culture for the successful digital transformation of companies? In order to answer this question, the short- and long-term tasks and challenges that need to be mastered with the support of a suitable corporate culture in the digital transformation have to be considered first.

On a **first level**, digital culture should support the transformation from an analog to a digital company, which fully exploits the potential of digital technologies in its products and processes and for its business models. On a **second level**, digital technologies present companies with much more comprehensive challenges. Due to the ever faster emergence of new digital technologies, companies are finding themselves in an increasingly uncertain business environment. The existence of companies whose value creation can be easily digitalized is threatened. Through new business models that are based on digital technologies and can be scaled quickly, entry barriers are falling away. Intruders can disrupt entire industries, and established companies are increasingly confronted with a change in customer needs driven by new technologies. In order to continue to be successful in this uncertain and constantly changing environment, companies must adapt to this, act flexibly and anticipate future digital-driven innovations. A strongly hierarchical, process-focused corporate culture would be fatal here. The digital culture appropriate for this environment is similar to the concept of a resilient organization.

The term **resilience** (Lengnick-Hall et al., 2011) primarily describes the ability to anticipate fundamental changes at every relevant level, to respond accordingly, and to recover from them if necessary. When comparing successfully resilient companies in the past, it becomes apparent that they share commonalities: a company-wide commitment to improved resilience, active and situation-oriented monitoring of opportunities and risks for the company—and above all a culture that promotes adaptability, agility and innovation.

These are, according to initial results, also the cornerstones of a digital culture adequate for digital transformation. A corporate culture that supports companies in their digital transformation and promotes long-term resilience is based on market- and employee-oriented values that, in combination, promote the agility of the company. This digital culture and its values, which have been identified here, are described in detail below (Duerr et al., 2018; Hartl & Hess, 2017). An overview can be found in Fig. 4.5.

4.3.2.2 Market Orientation as a Value in the Context of Digital Transformation

As described in the introduction, companies undergoing digital transformation are initially confronted with the development of new products, processes and business models based on digital technologies. They must react in order to remain relevant in the digital age. The foundation for this is a **market orientation** of the company, including the culture, which enables digital innovation. Innovation also serves as a countermeasure and protection measure to anticipate market developments and disruptions in an increasingly uncertain environment, to react as quickly as possible, and to ideally use them for themselves.

A central and essential value for a market-oriented and innovative corporate culture is a strong **customer focus.** This means an attitude of the

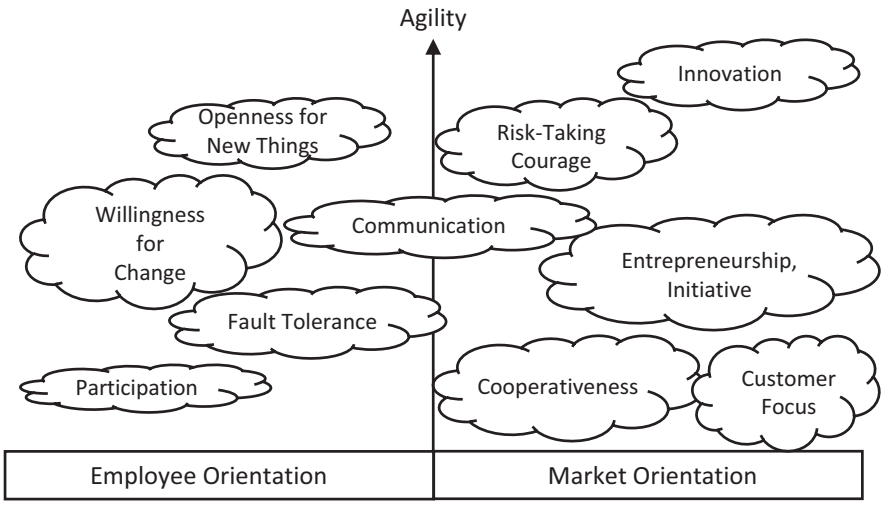

Fig. 4.5 Central Values of a Digital Culture (Hartl & Hess, 2017)

company that is customer-centered, that is, the orientation of all processes and products to the needs of the customer and the desire to serve them in the best possible way. This value is often praised as an ideal, regardless of the digital transformation, but it gains enormous importance against the background of the rapidly changing customer needs or expectations and requirements for products and services resulting from the progressing digitalization. An understanding of the customer needs changing through digital technologies is essential in order to be able to serve them and to take up corresponding market developments.

In order to be able to use the potential of new technologies, not only the resulting market developments have to be recognized, but these have to be subsequently implemented in innovations. Therefore, an **innovation-promoting culture** should primarily promote the development and further development of ideas. Values that promote the development of new ideas are **entrepreneurship** and **initiative.** This refers to the mindset of employees to develop and pursue ideas independently. A corporate culture that gives its employees the mantra of continuous improvement and further development implicitly requires them to develop ideas continuously. The basis for this is the empowerment of employees: If employees are given space and support for independent experimentation and the further development of ideas into more mature concepts, these quickly mature into testable prototypes—which can be tested and either discarded or developed into real innovations and ultimately drive the digital transformation of the company.

Further development, as well as early testing and experimentation of ideas, are of course mostly associated with uncertainty. The courage to take risks is therefore a central and not to be underestimated value of innovative corporate cultures. This means the willingness to take risks and not to shy away from decisions under uncertainty. In the course of digital transformation, new and unknown approaches are necessary, the success of which is often not predictable in advance. The courage to explore and radicalize them anyway and to accept them must be clearly promoted within a corporate culture so that employees can "conscientiously" take such risks. For this, a climate of tolerance and mutual respect is necessary in which employees can dare to suggest also unconventional ideas. In a digital corporate culture, the development of new, unconventional ideas is not only tolerated, but actively supported and promoted. The following therefore considers the second pillar of digital cultures: employee-oriented values.

4.3.2.3 Employee Orientation as a Value in the Context of Digital Transformation

In a corporate culture that punishes mistakes and puts the blame on someone, it is unlikely that an employee will leave his or her comfort zone to drive digital, risky initiatives. Keywords such as error culture, trial & error, "try often—fail fast" therefore reflect an important aspect of a digital culture. This refers to the values of **fault tolerance**—and contrary to what the name suggests, this is not just about tolerating errors, but even about actively promoting them. Tolerating errors creates an environment on the one hand that takes away the fear of employees to pursue radical and also unusual ideas, to make risky decisions and thus to promote the innovation of the company. On the other hand, actively promoting failure can also have a positive effect on the organization and accelerate the digital learning curve. If employees are encouraged to try out radical ideas, the failure of some projects is actually programmed. The awareness within the organization that this is not only okay, but that a fast failure is even desired, as this can generate useful insights, creates a fertile environment for far-reaching innovations.

Another value that companies should urgently give their employees is **openness to new things.** Digital technologies not only pose risks for companies, but also hold new potential and opportunities. In order to be able to seize these, however, companies and their employees must be willing to leave their comfort zone and adapt to new conditions in order to make use of the resulting opportunities. There needs to be an openness to new things within the company, a sort of basic curiosity, in order to discover and try out the unknown. Closely linked to this is the **willingness to change.** Not only a new, constantly changing environment created by new technologies requires adaptation by companies, but also the digital transformation of the company itself—or rather its measures—require a willingness to change. For a successful transformation of a company, it is crucial that the employees are open to new technologies, working methods and general changes and show the willingness to accept new things. The opposite of this would be a company culture oriented towards stability, which gives its employees security in known processes and thus leads to a certain resistance to change and everything new. This would be fatal for the success of any measure designed to promote digitalization, and thus deadly for a successful digital transformation of the company. An organizational value that promotes the willingness to accept changes and invest in the success of change measures is **participated** within the company. If employees of all levels are involved

in change processes from the beginning, if their opinion and feedback is obtained and reacted to accordingly, change measures achieve demonstrably greater success because change is better accepted.

4.3.2.4 Agility as a Value in the Context of Digital Transformation

The two pillars of the above-mentioned values oriented towards the market and employees aim at a more resilient organization which is able to act and react agile. Agility, i.e.—in this context—the ability to act and react quickly and flexibly as well as make decisions, is crucial for the success of transformation measures and the existence of digitally transformed companies and thus an overarching value of a digital corporate culture. In order to be able to work customer-centered in an increasingly uncertain environment, product development cycles need to be shortened. Hierarchical, strictly predefined waterfall models have become obsolete. In their place, more agile approaches are emerging, in which development teams work closely with the customer side to include customer needs in product development to the best possible extent. Departments that have previously operated largely independently of each other now need to work closely together.

However, the cultural soil must first be prepared. The values of **communication** and **willingness to cooperate** are therefore important basic requirements for a digital corporate culture that makes agility possible. A hermit-like culture à la "us against them" could destroy all cooperation. In a digital culture, silo thinking is broken down and values such as teamwork and open communication support both internal collaboration and external cooperation with partners. An open, collaboration- and communication-oriented culture can support the new requirements for cooperation and thus contribute to faster production cycles, decision-making and ultimately a more agile company.

The values mentioned so far do not stand alone, but rather depend on each other and only then enable further values. For example, many of the values mentioned above for employee-oriented companies only enable an environment in which new ideas can be generated and developed into innovations. On the other hand, employees of a customer-oriented company would be striving to meet the changing customer requirements on their own and therefore be more willing to accept and implement the necessary changes. A customer-oriented corporate culture can thus promote the willingness to change and adaptability of a company, as it is able to provide

employees with the justification and meaning behind these measures and thus involve them in the transformation of the company.

4.3.2.5 Conclusion

If you put all these values and aspects of digital culture together, you can simply describe it as **both family and business culture**—a corporate culture that is also common in digital start-ups. Therefore, established companies often use them as role models and target images for their digital transformation and digital culture. Now, a 20-person start-up is often participatory by virtue of its small size alone, and the employees naturally bring more initiative and openness to new things than is common in a medium-sized company or corporation that has been established for decades. A start-up culture, as it is found in start-ups, will therefore be difficult to transfer to established companies—and the question of whether this is even desirable remains open. However, the general direction is quite right.

The conclusion that this proclaimed ideal digital culture helps companies to meet the requirements of digital transformation seems to be confirmed in practice. A study conducted in cooperation with Deloitte at MIT shows that digitally advanced companies have an agile, risk-taking, collaborative culture with decentralized power structures than companies that are still at the beginning of their digital transformation (Kane et al., 2015). 80% of digitally advanced companies said they were actively taking measures to support and develop a digital culture. In German companies, culture is often still seen as the biggest obstacle to the success of transformation measures and a change in culture is considered urgently necessary. By acquiring digital start-ups or recruiting "digital natives", it is hoped that their culture can be adapted and a change "bottom-up" can be promoted. However, culture management remains the task of executives who actively promote and live the culture change.

But how to proceed and where to start? This will be explained in the following paragraph.

4.3.3 Selected Tools for Managing Cultural Change

There are a large number of ways in which the culture of a company can be analyzed and changed. Three important approaches are described below.

4.3.3.1 Culture Analysis

The **"Organizational Culture Assessment Instrument"** (Cameron & Quinn, 2011), abbreviated OCAI, developed by Cameron and Quinn, is a very simple and easy to use tool for capturing the status quo of a company's culture and tracking its change. The basis for the OCAI is the "Competing Values Framework" which has been validated multiple times through studies. This framework distinguishes between two basic value dimensions: flexibility versus stability and internal versus external focus. If you cross both axes with each other (see Fig. 4.6), you get a typology of four ideal-typical company cultures: clan, adhocracy, hierarchy, and market cultures. The digital culture desired for the digital transformation would correspond to a mixture of clan and adhocracy culture in this field—that is, the combination of collaborative and entrepreneurial culture described above.

The OCAI captures the prevailing culture of a company based on six dimensions:

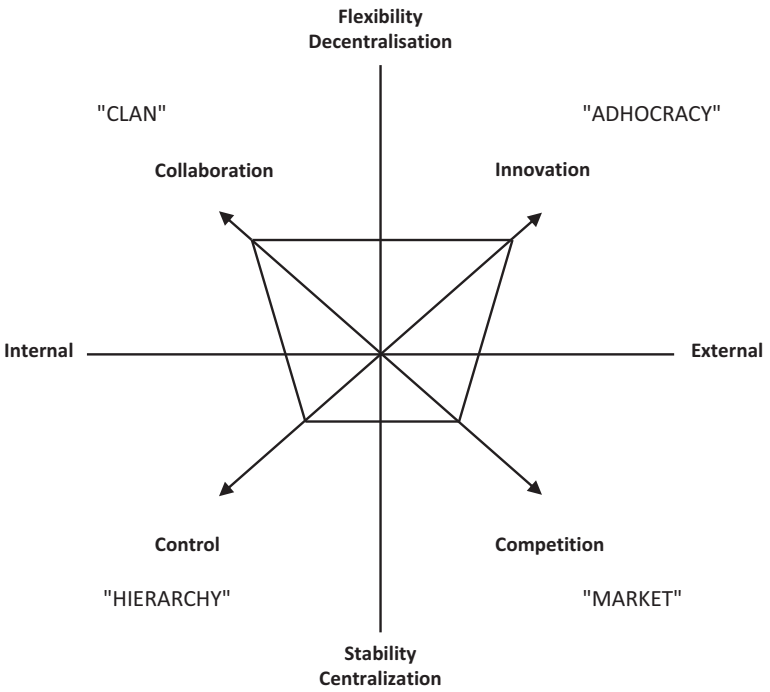

Fig. 4.6 Application of the "Competing Values Framework" (Cameron & Quinn, 2011)

- dominant characteristics,
- leadership style,
- employee relations,
- organizational cohesion,
- strategic orientation,
- success criteria.

For each of the cultural dimensions, four possible answers are given, each representing one of the cultural types. The respondent must first distribute 100 points over each of the four possible answers in order to capture the current manifestation of the company culture. If desired, another 100 points can be divided up afterwards—this time to capture the desired ideal culture of the respondent. Based on the results of the status quo analysis, the direction and necessary measures for a change towards a digital corporate culture can be derived. During the change process, the OCAI can also be used to show changes in the perception of employees and to make a cultural change measurable. For example, a company could conduct a company-wide employee survey using the OCAI questionnaire. Possible areas of focus:

- How far is the current corporate culture from the digital culture described above? This could give an indication of the extent of the necessary cultural change.
- Are there any differences in the perception of culture between employees and managers? If so, it would be necessary to create a common, realistic picture of the prevailing corporate culture in the first step. If the managers have a false image of the culture, this can prevent their support for change measures in the worst case—in the sense of: "Why should my team participate in the workshop? We've been working together openly and participatively for a long time now …".
- Are there any cultural differences between the departments? A departmental evaluation could show how much support the respective departments need in their cultural change.
- How successful have the previous change measures been? A re-survey three, six, or twelve months later could show, in comparison with the results of the first survey, whether and in which areas the corporate culture has changed.

4.3.3.2 IT Systems as Tools for Cultural Change

The question of whether the digitalization of the company, i.e. the implementation of certain IT systems, can itself be a tool for changing culture has not yet been finally clarified. It is clear that the introduction of IT systems and their use by employees strongly influences an organization and can contribute to changing habits and behavior (Volkoff et al., 2007). It would also be naive to believe that IT systems are value-neutral and that their introduction has no impact on the culture of a company. In the literature, several studies have indeed shown a change in corporate culture after the introduction of ERP, database or project management systems. In particular, the latter, together with communication or so-called enterprise social network systems, is said to have a great potential for changing corporate culture in relation to digital transformation.

As an example, the introduction of a classical chat tool is considered. Before the introduction of the tool, employees of the company only had the possibility to communicate via classical channels such as e-mail and telephone and to obtain feedback from their colleagues on urgent questions. However, colleagues may often be in meetings, so they cannot be reached by telephone, and in the flood of e-mails, short requests quickly disappear, so the answer is delayed. From a purely functional point of view, the new tool now enables employees to chat with their colleagues for a short time—but this opens up completely new possibilities for action: faster, informal communication, which makes it possible to obtain quick feedback on short questions and thus enables a more efficient, flexible and informal way of working—all values that are carried into the company through the introduction of the chat tool and can change existing work processes and -procedures. However, it is and remains essential for such an IT-induced organizational change that the systems introduced for change are also accepted and used by members of the organization—because without contact with the user, the potential for change of IT will remain unused.

Cultural Change Through IT Systems at Klöckner & Co

An example of how the introduction of IT tools can successfully support digital cultural change is provided by Klöckner & Co. The company deliberately used Yammer, an internal corporate social network, to support its far-reaching transformation strategy with a profound culture change.

Klöckner & Co is one of the largest international metal traders and digital pioneers in the steel industry. The supply and value chain in the steel industry was previously highly inefficiently organized: Many transactions were still

carried out by telephone, fax or e-mail, and there was no consistent digital order and production management. As part of the company strategy "Klöckner & Co 2020", Klöckner therefore aimed for the complete digitalization of the supply and value chain in order to build an internet-based industry platform for the steel and metal industry, which would eliminate the prevailing information asymmetries through the digital networking of all market participants and thus significantly increase efficiency for all parties involved. In order to implement this vision, the business model of Klöckner & Co had to be completely modernized and digitized—in short: the company had to be digitally transformed. One of the most important drivers of the associated culture change was the introduction and use of a company-wide social network. A social network supports employees in the development and implementation of new ideas and promotes hierarchy-free communication with colleagues across departmental boundaries. This made it possible for Klöckner & Co to break down communication silos and create fast, hierarchy-free communication channels and thus the best conditions for innovative work (Klöckner & Co, 2018).

4.3.3.3 The Role of Leaders

The role of leaders in change processes, especially in cultural change, should not be underestimated in any way. Their contribution to the success of change can hardly be emphasized enough. Culture is something shared within a company, but ultimately it is in the hands of leaders which values are lived or can be lived—by promoting or prohibiting corresponding behavior. This makes it the leaders who largely shape the culture of a company and who must necessarily contribute to a cultural change (Alvesson & Sveningsson, 2015).

In the first step, this primarily means involving leaders in the change. A promising step would be, for example, to tune the entire leadership team into the change in a digital bootcamp in order to awaken commitment and above all enthusiasm in the participants, which they can then pass on to their employees in the next step. That leaders not only communicate the new values to their employees, but live them themselves and actively demand them, is essential in order to trigger a cultural change at all. Whether leaders live the new values themselves or not makes the difference and decides whether the values are only perceived as pretty letters on the office wall or as new guidelines of action and thus determine the behavior and work of employees. As simple as the instrument "leading by example through leaders" may sound, it is a very decisive factor for the success of the digital cultural change.

4.3.4 Specific Procedure in a Cultural Change Project

There is not much disagreement about how to approach cultural change concretely. Alvesson and Sveningsson (2015) bring together two different approaches to cultural change in their approach: the "Reframing of Everyday Life" and the "Grand Technocratic Project". While the former is based on rather local, limited initiatives by individual managers, the "Grand Technocratic Project" is an approach to change culture comprehensively and across the company.

Since a company-wide cultural change in the course of digital transformation is the goal, the focus is subsequently on the **"Grand Technocratic Project"**. Here, a comprehensive change process is carried out, which typically takes place "top-down" and offers itself as an approach for a support project for digital transformation. Typically, two phases are gone through: an analysis phase and an implementation phase.

Both phases, their most important steps and exemplary tools are described in detail below. In Table 4.6 you will find a first overview.

4.3.4.1 Analysis Phase

In order to manage a corporate culture sensibly and make it fit for digital transformation, the status quo, i.e. the current corporate culture, must first be recorded. It is essential for a manager not to rely on his gut feeling and his own perception of the corporate culture. Because, as the results of a survey conducted by Capgemini show, managers and employees often have widely divergent ideas about how digital the culture of the company already is (Schaefer et al., 2017). While 20% of the managers surveyed in German companies said that their corporate culture was already digital, not a single one of the employees surveyed was of the same opinion.

Table 4.6 Procedure in a Grand Technocratic Project (Alvesson & Sveningsson, 2015)

Analysis	Step 1: Evaluation of the company situation and determination of goals and strategic direction Step 2: Analysis of the status quo culture and target culture Step 3: Show gaps between status quo and target Step 4: Development of a change plan
Implementation	Step 5: Implementation of the plan: Unfreeze, Change, Refreeze Step 6: Evaluating the change, monitoring changes and adapting the plan

A very simple and easy to use tool to get a first impression of the prevailing corporate culture is the "Organizational Culture Assessment Instrument" (OCAI) developed by Cameron and Quinn, which was introduced in Sect. 4.3.3.1. The results of the OCAI provide a good first impression of the culture prevailing in the company. However, a more detailed insight is necessary for a more detailed analysis, for example, a depth interview-based analysis. Here it is recommended that both interviews and analyses be carried out by external partners, because which manager would like to hear that he or she practices a hierarchical leadership style or which employee would make such a statement in a hierarchical culture? After determining the prevailing culture, the desired target culture is to be defined in order to derive appropriate measures and strategies from the gap between the status quo and the target image. At this point, it is important to mention that although the digital culture described above is considered ideal for a successful digital transformation, the "perfect corporate culture" does not exist. Which culture is ideal for a company depends on its products, processes and natural environment. So every company has to decide for itself which facets of the digital culture would be ideal and should be adopted by the company to what extent.

4.3.4.2 Implementation Phase

The implementation phase is the critical part of a culture change project, as it definitely decides the success of the culture change. Essentially, the implementation phase corresponds to a classical change project. The best-known change model comes from Lewin, and its three stages essentially correspond to the structure of all other process-focused change management models (Lewin, 1951).

At this point it makes sense to briefly join the discussion of whether a model that is just under 70 years old is still relevant today. Indeed, organizational change is now seen as an open, continuous, and unpredictable process without a clear beginning or end. Planned organizational change faces a more chaotic reality: Unpredictable consequences of the planned change approach, resistance, political processes, and misunderstandings are part of this and mean that change management cannot be limited to the execution of sequential steps. Lewin's model of a planned process is therefore subject to some criticism, but this is often based on a misinterpretation of his work. In fact, Lewin took this complexity into account and already proclaimed in his research that both the planning and the control of change should include

an iterative component and be adapted accordingly over the course of the project. From this point of view, his model is still relevant—provided that it is not a 1:1 instruction manual with strictly sequential steps, but rather a rough, general orientation regarding the most important phases of a change process.

The key to the approach lies in step five (see Fig. 4.7). There, in the steps **"Unfreeze", "Change"** and **"Refreeze"**, the implementation is to be carried out. The following describes these three sub-steps in more detail.

Unfreeze

Often, transformation efforts fail in the initial phase because the necessary conditions were not created. A suitable corporate culture is undoubtedly one of the most important requirements for digital transformation, so preparing for the necessary cultural change is one of the most important tasks of the transformation manager. In the first step of the cultural change, the "Unfreeze", it is exactly about preparing the corporate culture for change, "defrosting" it literally.

The biggest challenges that culture managers face in this phase are:

- lack of awareness of the urgency of change,
- resistance to change,
- lack of willingness to implement it.

A digital corporate culture that declares openness to new values supports the willingness to change. What is needed above all is an "organizational commitment", that is, the self-commitment of the entire organization to accept the change.

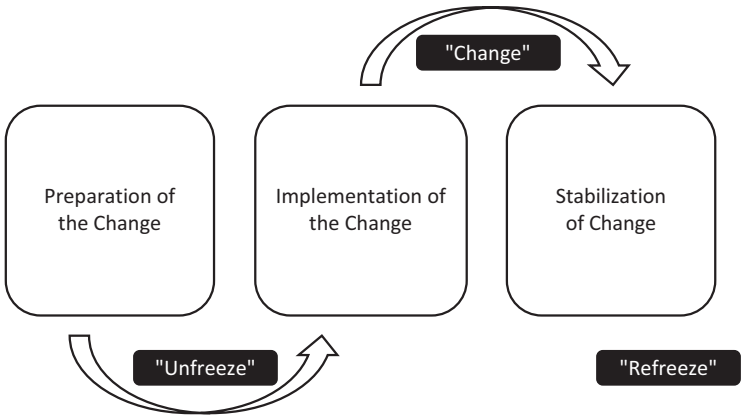

Fig. 4.7 Change Model According to Lewin (1951)

Cultural Change Through "Digital Lighthouses"

The Bremen-based logistics company Hansa Meyer Global (HMG) provides a prime example of how a company in the Mittelstand can drive digital development forward with limited resources and prepare employees for digital transformation. One successful measure is the "digital lighthouses": The focus here is on making new technologies and digital working methods known and visible within the company. The goal of digital lighthouses is to spread interest and enthusiasm for digital topics and to signal to employees above all: Something is happening, now it's starting. Coaching programs form the basis for a sustainable build-up of digital competence, and IT forums give employees the opportunity to exchange ideas, bring in questions and suggestions, and actively participate in the transformation. The HMG employees who are coached thus act as multipliers, spreading the knowledge they have acquired about new technologies throughout the organization and thus creating a digital affinity "bottom-up".

The realization that a change in culture is necessary can promote the willingness to change or reduce resistance to it. However, conveying the urgent need for a change in culture to employees can prove to be a difficult undertaking. As described at the beginning of the chapter, culture and its values usually arise from the success of certain behavioral strategies that are subsequently considered ideal and become the norm. However, it is essential to go against the legitimation of the existing culture. Both formulating a clear vision for the company and its culture and their constant and transparent communication—both central elements of project marketing—are effective measures to gradually dissolve resistance to change. Through targeted project marketing, the formulated vision can be conveyed to employees in order to generate a shared understanding of the company's goal and the urgency of change in the first step and to create the necessary support and willingness for subsequent measures in the second step as part of this vision. Whitewashing the situation would be fatal and completely miss the mark here—because if employees only realize the urgency of a change in their working methods and culture when their job is at risk, it is already too late for a successful change.

Change

As soon as the necessary willingness for a transformation is available, the change itself, the change process, can begin. As already mentioned several times, the digital transformation of a company must go hand in hand with a change in culture towards a digital culture. What initially sounds like an

unsolvable task can, however, be divided into smaller, manageable tasks when looked at more closely. It is not necessarily necessary to turn the entire corporate culture upside down in the change process. Often it is enough to interpret the existing core values of the company in a new and digital way. This way, the company's core personality and its core values are retained.

So every transformation manager has to do conceptual work first and foremost for the change phase: Which values and routines will continue to give me advantages as a company? Which ones might have to be reinterpreted, supplemented or changed in order to take my corporate culture into the digital age?

In digitalization projects, various departments work together. This is where subcultures shaped by different professional profiles meet, and misunderstandings are practically pre-programmed. Therefore, it is also the task of a transformation manager to improve communication and collaboration between the subcultures and to align or at least create a better understanding of each other's culture. The best means of approaching the subcultures in the past has been the interaction between key individuals and groups. Possible tools for promoting collaboration are, for example, hackathons (see also Sect. 5.2.3.2) or interdisciplinary rotation systems in training and further education, in order to bring employees closer to the thinking and working methods of other departments and thus promote a successful collaboration at a later stage.

Cultural Change at Telstra

An example of a successfully managed cultural change and the introduction of digital values is Telstra, Australia's leading telecommunications provider. Telstra's digital strategy aimed to digitalize all customer-oriented processes, such as billing, payment processes and customer inquiries. That Telstra was able to increase the percentage of digital customer transactions from less than 20 to 56% between 2011 and 2016 is mainly due to the close cooperation between product teams and digital units, as well as to the overall approach "Focus on culture first" of all transformation activities. Because without a corporate culture that supports organizational collaboration, millions can be invested in technology without anything changing. In order to digitalize the corporate culture, Telstra therefore carried out a number of initiatives, such as agile development methods and a switch to rapid prototyping, in order to create a more agile and collaborative culture. The most far-reaching cultural change took place with regard to the attitude towards the customer: In order to align the company with the customer and to anchor customer satisfaction as a fundamental value, teams received the Net Promoter Score for the customer channel they were responsible for every morning to motivate them to orient all their decisions on the needs of the customers.

During all change measures, employees should be involved and involved as far as possible in order to make them successful. A culture of open communication and transparency is essential for this. If these values do not yet exist in the company, it is not only important for the transformation manager to exemplify them through transparent communication, but also to actively seek the feedback of the employees.

Involving organization members in the change process from the beginning has proven to be a successful measure. Setting up idea platforms or so-called idea jams, in which employees can bring their ideas and feedback to change measures, is also of great importance and gives all organization members the feeling of not only being receivers, but also part of the change. In addition, this represents the first step in anchoring the value of participation within the company.

Refreeze

In the last phase according to Lewin's model, the changes that have been worked out in the company and in its culture should now be anchored. In order to anchor changed behavior firmly in a digital culture through individual initiatives, pilot projects and measures, early successes are important. Culture and its values are legitimized by the success of past action strategies. If the new behavior promoted by change measures is successful, this legitimizes its continuation, so that it increasingly becomes self-evident and is thus expected and seen as ideal behavior in the company—that is, as a new value of corporate culture. Transformation managers can support this cultural anchoring through the communication of successes and by promoting the changed behavior.

However, what is decisive for the long-term success of cultural change is above all the credibility of the cultural change. The new digital culture must be actively lived by the leaders, otherwise all cultural initiatives will lose credibility and quickly be labeled as one-day flies of a political agenda, but not as a new corporate identity, which is accepted as a guideline.

4.4 Building Competence for Digital Transformation

The ability to act in an organization is fundamentally determined by its competencies. Outstanding competencies in certain areas enable companies to secure a dominant position in their markets in the long term, especially if

they are difficult to imitate—the resource-based approach to corporate theory has long been worked out (Barney, 1991). For years, Apple's technology and innovation competence allowed it to dominate the market for mobile devices, Amazon's technology and logistics competence allowed it to become a leading online retailer in many countries. Google (Alphabet) was able to use its technology competence to establish itself as the embodiment of an Internet search engine and is today one of the world's leading Internet companies. However, missing competencies often impede entrepreneurial progress. In times of turbulent markets and constantly changing requirements, they can often lead to massive problems and even endanger the existence of a company. Nokia, for example, lacked the innovation competence to exploit the emerging market for smartphones, not only costing them their position as the world's largest mobile phone manufacturer, but also leading to their (temporary) complete withdrawal. AOL, one of the pioneers in the field of online access services, was unable to further develop its competencies in a rapidly progressing market, which ultimately led to a massive loss of importance. The German mail-order company Quelle lacked the necessary competenices to adapt its business model to the new rules of the online mail order business, which is why the company had to file for insolvency as a result of this development.

Digital innovations, as they are at the center of this book, require specific competences. But which competences are decisive for the success and failure in dealing with digital technologies? Which company areas should develop which competences? And how can the development of such competences be concretely approached? These and related questions will be addressed in the following sections.

4.4.1 The Need for Digitalization and Transformation Competence

In the past, many companies got by with relatively little IT expertise. Essentially, it was enough if the IT department knew how to develop IT systems and operate the IT infrastructure, possibly supplemented by skills in reorganizing processes. The specialist departments, the users of the IT systems, were only involved in the early stages of developing technical solutions, sometimes also in prioritizing IT budgets or formulating an IT strategy.

However, due to the increasing importance of IT-based solutions in all areas of the company, this "minimalist" view of technology competence is

often no longer sufficient. Rather, building IT competence as part of digital transformation is a key success factor. However, many companies and industries are still well behind (their own) expectations—there is a concrete need to catch up. In addition, building IT competence—which usually takes place mainly in the IT departments of companies—is the first important step in generating digital innovations, but these often require much more than just building technology competence in the narrower sense. In particular, a company needs the competence to recognize innovative digital technologies and possibly digital solutions based on them (e.g. social media marketing) at an early stage and the ability to actually develop digital products or services by mobilizing its digital resources (Wiesböck et al., 2020). This is often only possible to a very limited extent for an IT department, as its distance to products and business models is often simply too great. In addition, new digital solutions must be systematically implemented in an organization—just as technical solutions must be integrated into a system landscape.

Consequently, in the context of digital transformation, competencies are required that go beyond mere IT skills. Building on our definition at the beginning of Chap. 2 these may be referred to as **digitalization competencies**. In addition, competencies must be built for the conception, implementation and organizational introduction of new professional concepts—beyond any existing knowledge of business process optimization. These may be referred to as **transformation competence**.

The following section provides a closer description of these two competencies required in the context of digital innovation—digitalization competence and digital transformation competence (Wiesböck & Hess, 2018). For the sake of simplicity and ideally, a distinction is made here between IT units, specialist departments (such as marketing, controlling or development) and units specialized in digital transformation (digitalization units, see Sect. 4.2.2).

4.4.1.1 Need for Digitalization Competence

The digitalization competence of an organization describes its ability to develop and operate new solutions based on digital technologies. First of all, it is crucial for companies to identify and select the relevant digital technologies. This can pose a great challenge, especially for companies that are inexperienced in digitalization. Not every technology that is currently being hyped up in the media or by management consultants is relevant for every company. The benefits and added value of each technology must be carefully

evaluated and aligned with the strategic orientation of the innovation goals. Once the right technologies have been selected, they usually have to be adapted to the specific situation. A "plug and play" approach is not possible in most cases. The thus adapted technology must then be embedded in a new or existing system in order to be usable. From this point on, the operation and maintenance of the resulting digital solution must be efficiently ensured and a process for further development started.

In addition, companies must not only be able to develop new digital solutions, but also to use digital tools, to combine digital and physical resources and to manage the general IT functions (e.g. IT planning, IT design, IT budgeting, IT project management, etc.). Furthermore, it is necessary to further develop and adapt the existing IT infrastructure, otherwise the integration of new digital solutions will be limited. Last but not least, the use of IT also requires a strategy. This typically includes a target image for the future IT landscape, decisions on IT management and statements on the financial framework of IT.

The specialist departments that use the systems should be involved in the identification and selection of important technologies and should also be involved to some extent in the implementation of the systems and their further development. The digitalization units can support this process, which can contribute significantly to the coordination with the transformation efforts. Table 4.7 shows this division in an overview. The more points are listed, the more important the respective organizational unit is for the topic.

Table 4.7 Need for Digitalization Competence

Topics	Specialized department	Digitalization unit	IT unit
Identification and selection of relevant digital technologies	•	••	••
Realization of digital solutions	•	•	•••
Embedding digital solutions in the existing system landscape			•••
Use of digital solutions	•••		
Maintenance and further development of digital solutions	•		•••
Providing IT infrastructure			•••
Developing IT strategy	•	•	•••

4.4.1.2 Need for Transformation Competence

The **Digital Transformation Competency** of an organization describes its ability to develop, integrate and operate digital business concepts. Such digital business concepts (e.g. in the form of new products) complement the digital solutions developed on the basis of digital technologies. These tasks should be equally assumed by the specialist department and the digitalization unit, with the digitalization unit providing the methodological support, supporting the process of strategy development and organizing the creation of the conditions beyond the flexibility of the IT landscape. The role of the IT unit is rather small in the context of digital transformation; it should support the identification of new business approaches, the already mentioned flexibility of the IT landscape and the coordination of the IT strategy with the transformation strategy. Table 4.8 shows the proposed roles in overview. The same notation as in Table 4.7 applies.

4.4.1.3 Differentiation in Practice

Tables 4.7 and 4.8 are, on closer inspection, still very abstract. In operational reality, further differentiation is required, especially when it comes to determining the specific competence requirements.

For digital competence, another differentiation according to technology classes is possible. For example, companies that rely on social media channels must be able to implement social media technologies, embed the resulting solutions, etc. Companies must therefore describe their competence needs in detail, also because many employees in the technology sector are strongly attached to technology.

The same applies analogously to competence in the field of digital transformation. Here, a distinction can be made between products, interfaces,

Table 4.8 Need for Digital Transformation Competence

	Department	Digitalization unit	IT unit
Discover digital business opportunities	•••	••	•
Realize digital business concepts	••	••	
Embed digital business concepts in existing structures	••	••	
Use, maintenance and further development of digital business concepts	••	•	
Creating the conditions for digital transformation	•	•••	•
Developing the DT strategy	••	•••	•

processes and business models. While, for example, the competence of a company in product design and product testing plays a decisive role in digital product innovation, digital process innovation typically requires expertise in process modeling and process mining. Business model innovation (such as tapping into a new revenue stream) also requires specific expertise, often also a different perspective. Analogous to the construction of digital competence, a company must therefore also focus on transformation competence. In media companies, for example, the focus will be on product- and business model-related competence, while insurers currently focus more on competence in relation to business processes and possibly products.

4.4.2 Two Ways of Meeting Needs

After the previous considerations regarding the type of required competence, the question now arises to what extent a specific company should build up this competence itself or buy them from outside.

The question of a company's competence in the field of digitalization, i.e. the realization and maintenance of application systems as well as the operation of the required hardware and network infrastructure, has been intensively described and investigated for years under the keyword of "IT outsourcing" (Haas, 2018; Rickmann, 2013). In the early years of the application of digital technologies in companies, the companies themselves created the software used, and the hardware was purchased. Relatively quickly, a large number of standard software solutions developed for both smaller application areas such as word processing as well as for complex business applications. In this way, existing in-house developments were gradually replaced. The in-house development of software was typically only limited to a few applications and was often realized with the help of development partners near or far abroad. Solutions from outside were also used for the networking of computers that was now necessary; often only the operation of networks within a building remained in the company. With the development of cloud computing (see Sect. 4.1), which is based on the infrastructure of the Internet, the operation and maintenance of the used standard software is also gradually being outsourced to service providers. This should reduce IT costs, facilitate access to the latest technologies and ultimately solve the difficult problem of recruiting IT specialists. The operational focus of the IT departments of companies is now increasingly on the configuration of externally sourced and possibly also externally operated software

solutions, supplemented by the development of a few selected applications in places.

The question now arises as to whether this trend towards less manufacturing depth in IT can be maintained in the course of increasing digitalization. In essence, this is confirmed—low differentiation potential, high costs, rapid technological change and often also problems in procuring suitable employees speak against high manufacturing depth in IT. Even in the course of increasing digitalization, companies should usually procure the hardware from outside, give the networks to specialists and limit themselves to the integration and configuration of existing software solutions, possibly supplemented by point-specific extensions. However, the ability to observe and test new technologies at an early stage should be maintained. An exception is if a company places digital offers in its center alone, as is the case, for example, with operators of information services (such as search engines) and marketplaces (such as auction platforms). In these cases, possibly also with some of the hybrid online-offline products, the competence for the creation of these systems should be built up in-house.

A clearly different picture results with regard to transformation competence. Although there are no wide-ranging studies yet, a certain trend can already be seen. The history here is quite different from the technological level. In many companies, competence for the development of digital offers and the establishment of digital business models has so far been largely lacking. These have to be set up at the moment, both in the line departments and in supporting digitalization units. Of course, consultants can be used to create the entry into digital transformation, to set up the appropriate structures and to accompany first concrete projects. Ultimately, however, digital transformation is a permanent task that can only really be solved internally. In addition, in most cases many good initiatives for new products and processes come from the company itself. This also speaks in favor of further developing one's own team or setting up new departments.

4.4.3 Approaches for Building Transformation Competence

Many companies lack the essential and—as described above—not sustainable from the outside competencies for the management of digital transformation. Typically, companies have to expand their transformation competencies specifically through internal or external measures. Table 4.9 gives an overview of possible measures.

Internal measures taken by companies aim to create structures and processes that will further qualify the existing staff accordingly. An established way to build technological or digital innovation competence is the targeted training of individual employees, managers or entire project teams. Trainings can be carried out either by internal competence providers, such as the CDO, or by external specialists. The latter has the advantage that new knowledge can thus enter the organization from the outside. Many companies also rely on regular training sessions or training facilities that are firmly established within the company, such as so-called IT dojos, which employees can visit at any time to find out about new technological trends or to receive specific training.

Another way in which innovation and creativity can be promoted within the organization is the creation of so-called innovation labs or creativity labs. These are physical or virtual workspaces and environments that are specially designed for collaboration and in which employees and teams can work on their creative thinking processes and innovative ideas. In addition to building competence, innovation and creativity labs are intended to increase the creativity of employees and promote new developments by enabling employees to exchange information, knowledge and ideas across the board. The rooms are therefore designed to support creative collaboration as best as possible. For example, employees could be provided with labs with a workshop character in which they have the opportunity to try out their ideas with little effort and to create and test first, simple prototypes.

Another common way to build internal competence is through cross-functional teams. By bringing together staff from different parts of

Table 4.9 Approaches to Building Transformation Competencies

Internal measures	Innovation & Creativity Labs
	Targeted training
	Cross-functional teams
	Hackathons
	Enterprise-wide training
	Excursions
	Job rotation
External measures	Recruitment of qualified employees
	Recruitment of competence teams
	Acquisition of start-ups/companies
	Outsourcing to service providers
Hybrid measures	Strategic university cooperation
	Cooperation with start-ups
	Trainee programs
	Dual degree programs

the company, in particular by linking technological know-how and business knowledge, innovative solutions and products can emerge. In addition, these teams also contribute to reducing the digital divide within the company.

Hackathons can be used to generate ideas (see also Sect. 5.2.3.2). However, a number of companies are now using hackathons to position themselves as potential employers and to find and win new employees.

In addition to targeted training, companies can also contribute to competence development with wide-ranging, company-wide training measures (lectures, seminars, online courses). These are usually less expensive than individual training and help to build basic skills (for example in the use of digital technologies) in the workforce. Measures such as job rotation can also contribute to a broader competence base in the company. If employees not only know their own, narrowly defined workflows, but also the tasks of their colleagues, and if they are regularly in contact with new digital tools in the process, this can promote a more holistic and innovative way of thinking among employees. For individual employees with corresponding task areas, a stay in "digital epicenters" such as Silicon Valley can also be beneficial.

Alternatively, companies can acquire the required competencies externally, for example by recruiting new employees, taking over start-ups or corresponding business areas from competitors. In extreme cases, it is also conceivable to outsource to an external service provider.

Through the external acquisition of employees, teams or even entire companies, a company can quickly and effectively acquire highly qualified talents with the necessary skills and know-how, without having to pay "expensive tuition fees" for internal competence building. For the company, the new employees' professional and technological knowledge opens up new development and business opportunities. However, companies are particularly challenged in the digital transformation unit in terms of competition for competent talents, as only partially qualified personnel is available on the market. In addition, the company should be aware of the challenges that can arise from the clash of different working methods and cultures. In order to realize synergy effects that arise from the linking of already existing internal competence with complementary new competence, the onboarding and integration of new employees should be planned in advance. Cultural aspects can often become an essential hurdle. This is especially true for the integration of acquired teams or even parts of companies. Here too, different working methods, corporate cultures and objectives can lead to conflicts. If a company leaves the newly acquired units a lot of freedom and lets them run largely independently, the question arises as to how the newly acquired competence and know-how can be transferred to the existing company. If

the connection is too tight and too much adaptation pressure is exerted on the new units, there is a risk that the competent employees will resign and only a relatively worthless shell will remain for the company. Therefore, an appropriate balance between integration and freedom is particularly important in the early phases after the acquisition. A similar situation arises with the takeover of entire start-ups.

Outsourcing to external service providers also carries the usual risks of outsourcing. Companies may become dependent on individual providers and lose control over their know-how. This is particularly dangerous at times when the value-added structures in companies and markets are shifting as a result of digital transformation, as companies may know less about their newly developed core business processes than external service providers. Furthermore, the costs of digitalization and digital transformation projects are often difficult to estimate in advance, as there are few comparable projects that could serve as benchmarks. To overcome these challenges, companies should install strategic provider management, establish a systematic and continuous transfer of knowledge between external service providers and internal employees, and also consider mechanisms for risk sharing in contract design.

Hybrid measures that use both external expertise and internal expertise can be a sensible alternative, for example in the form of long-term strategic university cooperation. Through strategic cooperation between public and private organizations and through participation in university courses specifically oriented towards the digital economy, new expertise can be built up.

Example of a Successful Cooperation Between Companies and Universities

An example of the close and long-term cooperation between science and practice is the Internet Business Cluster (IBC) in the Munich area. The IBC is a non-profit organization in which universities and companies from strongly digitalizing industries in the Munich region have joined forces to jointly tackle the challenges of digital transformation. The members of the association not only receive scientific findings on the subject of digitalization, but also benefit from networking opportunities and access to young talents from the universities.

Cooperations with start-ups are also a popular measure to connect external competencies with internal competence development. In contrast to a complete takeover, and integration into the company is not necessary here, and the degree of exchange or cooperation can be agreed upon in advance. The company thus benefits from the innovation competence of the partner,

while the start-up, for example, can use the positive signal effect (to investors, potential employees, partners) of a cooperation with a larger company. This is particularly evident in the financial sector, where the increasing spread of technology-driven companies has put traditional banks under increasing pressure to modernize their core business activities and services. Many banks are responding to this challenge by entering into partnerships with fintech start-ups that offer technology-based financial services (Hornuf et al., 2020).

Corporate trainee programs can also be a suitable way to build the required competencies. In the ideal case, companies gain young graduates who have already acquired valuable competencies during their studies and bring with them a "digital mindset". During the trainee program (usually one to two years), these employees are then specifically trained for the respective application context of the company and can effectively apply external and internal knowledge after completion of the program. A similar approach is represented by dual degree programs, which, however, start a little earlier. Here, companies accompany young talents during their parallel studies and take over the practical training of the students as practice partners.

Other innovative instruments for personnel acquisition are targeted recruiting events, workshops, cooperation with specialized personnel consultants or the use of recruiting apps. New incentive systems that are not only based on monetary incentives, but also, for example, specifically oriented towards the digital world, such as further education and travel, can also be considered. It should also be noted here that the workplace should be designed to meet the needs of potential digital employees, for example by the flexible design of working hours, possibilities for home office or remote working, and freely available time for further education and training.

Example of Successful Digital Competence Building

The exemplary case of a company from the metal processing industry shows how the building of digital competence can succeed. At the beginning of the digital transformation process, the required competence was hardly or not at all available in the company. Training to build these skills was also not possible because there was no one in the company to design and implement them. For this reason, a digitalization unit was set up, a larger number of external specialists were recruited for the areas of digital product development and personnel development, and experts for processes and projects were brought on board. For the targeted building of competence, the company now relies on workshops and training on various topics. Another important building block is also cross-functional projects in which a continuous transfer of knowledge

takes place between the employees involved from different company areas and functions. In addition, the company operates long-term university partnerships in order to use knowledge from research for itself and to gain contacts with "digital talents". For this purpose, it also prepares and implements small projects for student groups.

The practice study by etventure (2018) shows that companies so far mainly rely on training programs for employees to convey digital basic knowledge and special agile methods (79%), internal idea competitions (46%) as well as the targeted promotion of employees' entrepreneurial engagement (44%). In addition, employees are given the opportunity to work in other company areas that are responsible for digital transformation (26%) or even to participate in digitalization projects outside the company (22%). In addition, more than one third of companies said they use start-up partnerships. In order to be attractive to potential new employees who bring the required digital skills, strategic employer branding is also a decisive instrument. The positioning of the company as an innovative digitalizer is one of the decisive factors in winning rare and correspondingly desired digital specialists in the labor market (etventure, 2018).

4.4.4 Add-on: Dynamic Skills for Digital Transformation

In the context of digital transformation, it is of enormous importance that companies build up skills to identify trends early on in a rapidly changing environment and exploit them. This is especially important because digital transformation proceeds differently in every organization and therefore requires a separate approach. In addition, companies that have taken a certain path in digital transformation must continuously adjust the required skills due to the dynamic nature of digital change. Due to these properties of digital transformation, it makes sense to examine the development of skills based on dynamic capabilities ("dynamic capabilities"), as they explain how companies can react to the rapid change of technologies and markets (Teece, 2007). Dynamic capabilities describe the ability of a company to a) identify and shape opportunities and threats ("sensing"), b) seize opportunities ("seizing"), and c) maintain competitiveness by adapting the business model and the broader resource base of the company ("transforming").

Warner and Wäger (2019) have conceptualized digital transformation as a process of building dynamic capabilities for ongoing strategic renewal (see Fig. 4.8). The starting point of the model is external impulses, including digital competitors, changed consumer behavior, and disruptive digital technologies,

which trigger the building of dynamic capabilities for digital transformation. In addition, the model specifies three internal enablers (cross-functional teams, fast decision-making, and management support) and three internal barriers (rigid strategic planning, resistance to change, and a high level of hierarchy), which influence the formation of dynamic capabilities.

First, companies must develop "digital sensing" capabilities. This includes building competencies in digital scenario planning and digital scouting to identify the new technological, customer, and competitive trends. Specifically, this means using informal and formal networks, big data analytics and artificial intelligence to identify customer-oriented trends that are otherwise difficult to predict. These capabilities are based on developing a digital mindset, i.e. creating a digitally oriented culture and long-term digital vision. With the "digital seizing" capabilities, companies must incorporate strategic agility into their business model to quickly exploit technological opportunities and market opportunities, seize the latest trends, and avoid potential existential threats. Rapid prototyping is essential for increasing strategic agility, as it allows customers to collect and use feedback almost in real-time to respond to trends. In addition, business model innovations should be aligned with existing product-based business models to create a balanced digital portfolio. Finally, companies must develop "digital transforming" capabilities. This includes traditional companies building

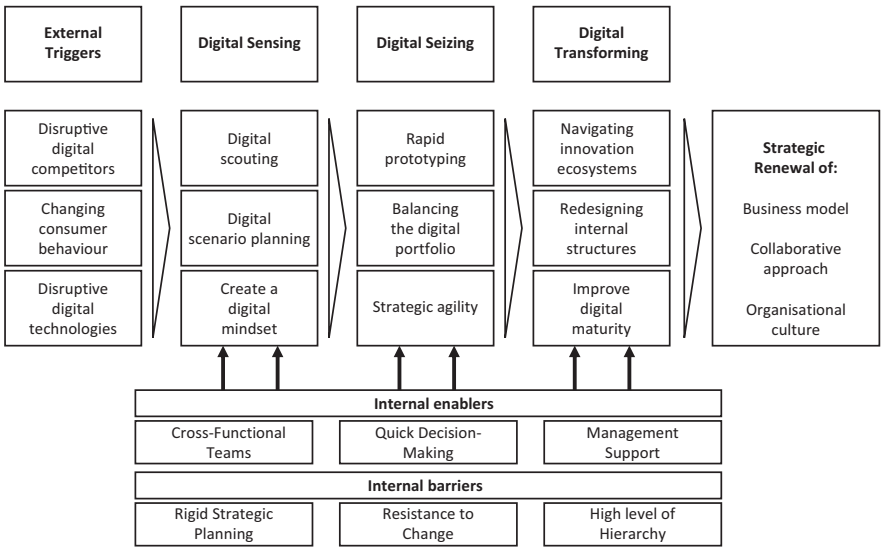

Fig. 4.8 Process Model for Building Dynamic Capabilities for Digital Transformation (Warner & Wäger, 2019)

or joining a digital innovation ecosystem to work with new partners. Companies should also work towards a redesign of internal structures, which can be achieved, for example, by decentralizing business units and setting up independent subsidiaries. Finally, improving the digital maturity of the workforce is a key capability for the digital transformation of companies.

Building dynamic capabilities can ultimately lead to a strategic renewal of the business model, the collaborative approach (the way people work across departments and divisions) and the organizational culture. It should be noted that building dynamic capabilities is specific to each digital transformation, requiring a continuous review and renewal of business models, collaborative approaches, and organizational cultures. In addition, new external impulses can arise at any time, which may re-weight the need to identify and seize opportunities.

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