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Developing IT Strategies

Whitepaper





Designing IT Strategies

Whitepaper



Publishing Information

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1 Executive Summary

In the age of digitalization, IT strategies are becoming increasingly important. This is due to the fact that corporate IT is the key enabler of digitalization and digital transformation within companies. In many companies, however, corporate IT is not well-aligned with the overall organizational strategy, preventing it from providing the best possible value for the different organizational units. A major challenge is posed by what we term IT complexity, which reduces efficiency and generates high costs for the corporate IT department.

This white paper outlines solutions for companies facing this issue. First, we provide an overview of the relevant terms and highlight the challenges confronting enterprises today. Central to this paper, we describe a four-step approach for the design of an IT strategy. We introduce various tools with which to assess the current situation and identify relevant aspects of the environment. Subsequently we outline an approach to strategy formulation and describe tools for strategy implementation and monitoring. Finally, a foresight highlights what companies need to do to thrive in the future.



PLANNED

Time in Planned Downtime
01:29:18
Time in Planned Downtime Job / Shift
01:29:18 / 01:39:38

DOWNTIME

Time in Downtime
01:12:09
Time in Downtime Job / Shift
01:12:09 / 01:18:11

SETUP

Time in Setup
00:58:23
Time in Setup Job / Shift
00:58:23 / 00:59:57

RUNNING

Time in Running
01:51:33
Time in Running Job / Shift
01:51:33 / 01:...

Run Speed
15646
sleeves/hour

Power

0 / 41

Light 1
0 / 15 W / 3000

Light 2
0 / 12 W / 3000

Machine A
0 / 289 W / 3000

Machine B
0 / 100 W / 3000

SLEEVES IN
245921/900000

SLEEVES OUT
245617/900000

SHIFT

JOB

OUT

EVENTS

STARTS

2 The Importance of IT Strategies in the Age of Digitalization

The increasing use of digital technologies within companies has a considerable impact on and offers great opportunities for companies. Digitalization affects, for example, the relationship with existing customers and makes it possible, based on new business models, to capture new customer segments (see HOFFMANN A. HEIMES 2018, p. 986).

The use of information technology (IT) is a central enabler of digitalization. Within companies, it allows the seamless use of data across organizational functions, sites, and systems. This makes it possible to streamline and optimize processes. In addition, through the use of suitable systems and interfaces, IT enables companies to communicate more efficiently with customers and suppliers. If data are collected and used to sell configuration parameters of machines, for example, IT can even form the basis for establishing new business segments.

The above named new opportunities of IT increase the range of tasks undertaken by employees concerned with information technology, typically members of the IT department. In addition to

its more traditional responsibilities and the cost pressures it is subject to, the IT department is facing new challenges such as managing new IT systems, the use of sensor technologies on the shop floor, and machine-to-machine communication, just to name a few. Corporate IT is thus increasingly characterized by a daunting complexity that is difficult to manage, and which managing directors and IT staff seek to come to terms with. If the company fails to address the problem of complexity, this may result in insufficient support of corporate goals and a negative perception of the IT department within the organization.

For these reasons, the development of an IT strategy that is geared towards addressing the requirements of digitalization and meeting the challenges posed by IT complexity is a central mean for companies to future-proof their business. Against this backdrop, we show in the present white paper how IT complexity arises and how IT strategies can be developed in a structured manner. The concrete example of a small-to-medium enterprise serves to demonstrate how an IT strategy has been designed using the presented approach.



3 Our Understanding of IT Strategy and IT Complexity

3.1 IT Complexity

In order to be able to master IT complexity, it is necessary to understand its source. For this reason, in the following, we will give a brief overview of the three dimensions which, taken together, result in complexity.

One reason for the emergence of complexity is the *interdependent variety* of elements such as IT systems, data, and interfaces. The greater the variety, the more complicated is the overall system. Variety alone could be mastered by representing all components in comprehensive documentation and process descriptions. However, this complexity is increased by the second dimension, the *unsettling dynamic* of technological developments and requirements (e.g. of organizational units, clients, or regulators). This great variety and dynamic result in a *diffuse perception* of the IT system landscape, based on which decisions are made, which in turn may result in increased IT complexity (see SCHUH ET AL. 2017, p. 61). The three dimensions are depicted in Figure 1.

Seeking to eliminate IT complexity in order to obtain simpler systems is not a viable option for companies. Simple systems are not able to support business processes to the required extent, and, as a result, the different business units might decide to introduce their own IT systems. This would give rise to “shadow IT” (see ZIMMERMANN A. RENTROP 2012, p. 62), which in turn leads to an even more diffuse perception of the situation. The task of IT complexity management is therefore rather to recognize non-value-adding IT complexity and to prevent it as far as possible..

The level of IT complexity has a decisive impact on the success of IT projects. If an IT project must be implemented within a highly complex environment, the probability of its failure increases. Such environments are characterized, for example, by insufficient documentation of existing systems (“diffuse perception”), a large number of involved stakeholders (“interdependent variety”), as well as unstructured requirement processes (“unsettling dynamic”).

In conclusion, it may be stated that non-value adding IT complexity generates costs which are not in proportion to the benefits achieved for the business.

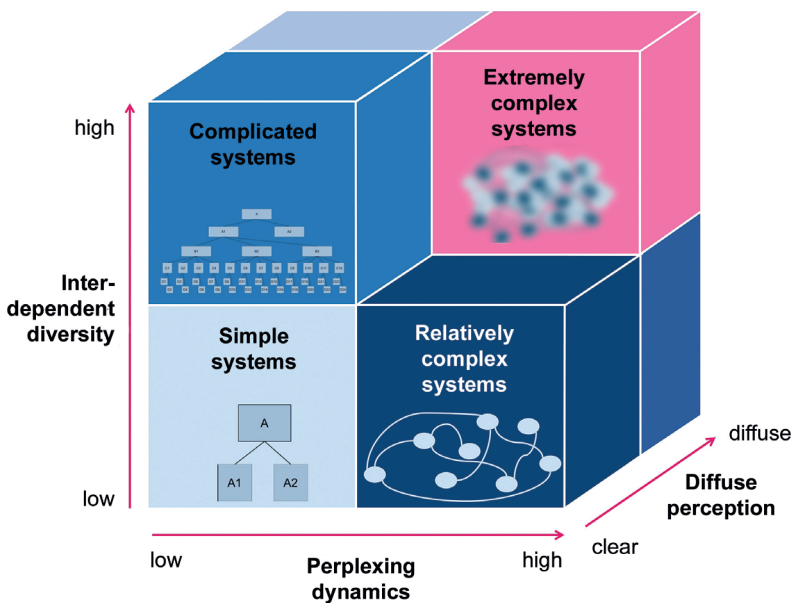


Figure 1: Dimensions of IT complexity (adapted from SCHUH ET AL. 2013)

3.2 Strategies

3.2.1 Corporate Strategy

In business administration, the corporate strategy is described as setting an enterprise’s “long-term direction” (see JOHANNING 2014, pp. 95-96). Many businesses find defining a corporate strategy challenging; however, a corporate strategy does not need to be captured in a comprehensive strategy paper. Often, it is sufficient to formulate a corporate vision, which functions as a beacon for the company and provides guidance to its employees. The strategy can be developed, for example, with the help of the strategic perspectives, namely market, resources and network (see SCHUH ET AL. 2011, p. 85).

For the development of an IT strategy, the overarching corporate strategy plays a central role, as the IT strategy needs to take direction from

and align with the corporate strategy. However, in turn, the IT strategy may have an impact on the corporate strategy. Such chains of effects are frequently underestimated. For this reason, the benefits of a continually developing corporate IT should be taken into account in an enterprise’s strategic planning activities (see KRUMAR 2015, p. 92-93).

3.2.2 IT Strategy

Relating to the current state of a company’s corporate IT, the IT strategy describes how information technology is to be designed and used as a tool within the company (see TIEMEYER 2017, p. 30). It establishes a high-level strategic direction for the future development of corporate IT that provides a basis for all future decisions (see MANGIAPANE A. BÜCHLER 2015, p. 95). In concrete terms, IT vision, IT mission and IT objectives are integrated within a holistic visual representation (see Figure 2), which

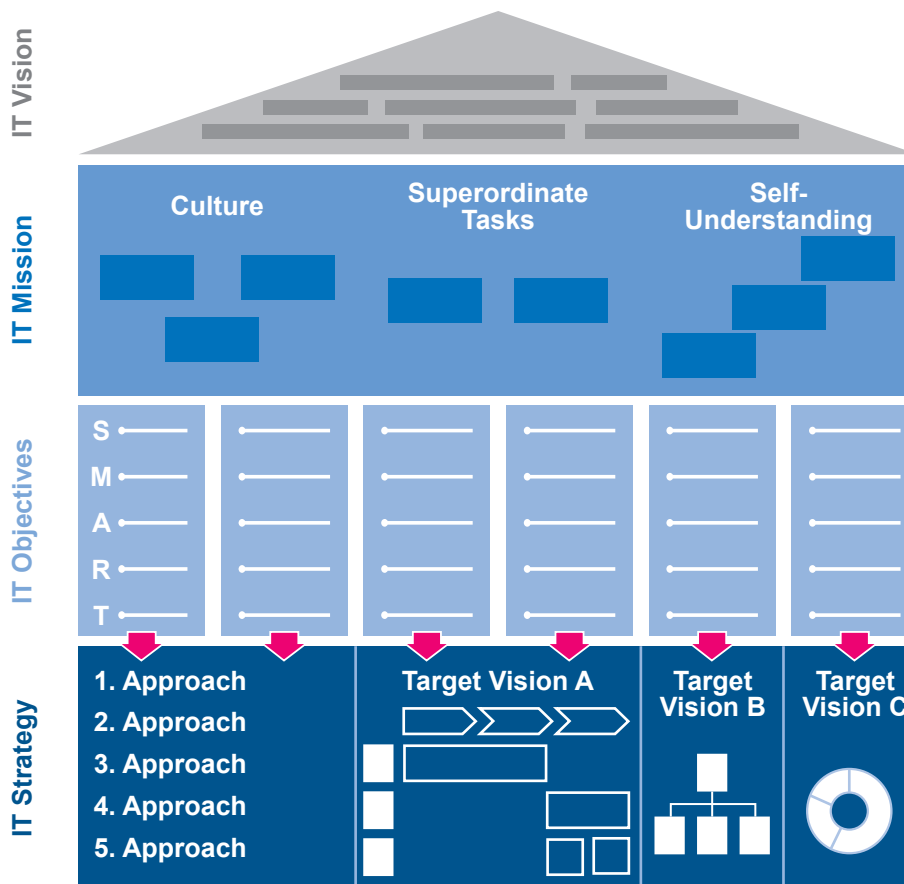


Figure 2: Relationships between IT vision, IT mission, IT objectives, and IT strategy (authors’ own elaboration)

highlights the opportunities to be pursued by the company regarding information and communication technologies (see TIEMEYER 2017, p. 30). The IT strategy overlaps with the digitalization strategy, which defines, in writing, the strategic-analytic direction of the company's digitalization activities. The latter strategy, however, has a different focus and revolves around areas such as the company's customers or products, while the IT strategy is primarily concerned with the internal company context. The goals and objectives defined by the IT strategy should be achievable within a period of three to five years (see JOHANNING 2014, p. 109).

3.2.2.1 IT Vision

The vision outlines what the company or one of its constituent parts is to "look like" in the future (see HUNGENBERG 2014, p. 26). It provides a short, succinct description of the IT department's strategic direction concerning corporate IT and provides a basic outline of the IT strategy (see MANGIAPANE A. BÜCHLER 2015, p. 136). The strategic direction is valid for a period of about five years.

The IT Vision should underscore the purpose of the IT department and demonstrate the reasons for its existence (see SCHUH ET AL. 2011, p. 67). It should highlight the information and communication technologies that are instrumental in making more efficient use of corporate resources, optimizing inter-company connectedness, and supporting the development of staff competence (see TIEMEYER 2017, p. 5).

The vision can consist of a straightforward statement. Deutsche Post AG, for example, has formulated the following IT vision: "IT Services is the Business Technology Partner of Choice for the Divisions of DPDHL" (DEUTSCHE POST AG 2018).

3.2.2.2 IT Mission

The mission elaborates on the vision in the form of written guidelines for action (see HUNGENBERG 2014, p. 26). It serves as a compass that provides guidance for employees. It formulates the impact of IT on the company's environment and sets out the values to be put into practice. The guidelines for action defined in the IT mission statement define the IT employees' different fields of activity, their joint competencies, and the values to be held vis-à-vis the different stakeholders (see HUNGENBERG 2014, pp. 420-421). Defining the mission, several objectives are to be achieved: It needs to contain statements on the purpose of corporate IT, outline general goals, and describe standards for behavior. By contrast with the vision, the mission may present both current and future focuses and directions (see SCHUH ET AL. 2011, S. 69)

As part of the above named strategy process, Deutsche Post AG has published the following IT mission:

"We transform technologies into value for the DPDHL Group through:

- *Leveraging synergies across DPDHL Group divisions*
- *Focusing our capabilities on our customers' needs*
- *Optimizing integrated and lean processes*

We rely on our people's IT expertise and their in-depth DPDHL Group and logistics industry knowledge"

(DEUTSCHE POST AG 2018).

3.2.2.3 IT Objectives and Target Pictures

In order to make both the IT vision and IT mission more concrete, IT objectives can be formulated in writing and visually represented in IT target pictures. To arrive at a clear formulation, it is recommended to focus on expected results. This helps to clearly communicate the goals and prevent confusion within the company about the defined IT objectives. Such confusion could be detrimental to the successful implementation and achievement of IT objectives (see MANGIAPANE A. BÜCHLER 2015, p. 129). When writing down IT objectives, several perspectives should be taken into account. These include the financial perspective, both customer and staff perspectives, the innovation perspective, as well as the perspective of internal business processes (see TIEMEYER 2017, p. 6).

3.2.2.4 IT Sub-Strategies

Depending on the size of corporate IT, the IT strategy can be subdivided into different sub-strategies. The strategy itself is developed drawing on the above named target pictures and the implementation projects for its different constituents. This process is described in more detail in Chapter 5.

¹For an overview of possible chapters of the IT strategy document see BERGMANN A. TIEMEYER 2017, p. 771.

4 Current Situation of Companies in Germany

Enterprises have recognized the potential of interconnected digitalization (see HEIMANN ET AL. 2018, p. 17). They see the opportunities afforded by digitalization as a chance to further develop their business models, including in relation to organizational change and increased business productivity through the technology-based support of staff (see ICKS ET AL. 2017, p. 42). However, due to the challenges named in Chapter 2, this potential has not been fully exploited so far (see STICH ET AL. 2018, p. 26). According to a 2018 study, 70 percent of German CIOs are concerned that the situation will get even worse: they assume that a further increase in IT complexity will make it soon impossible to manage digital performance effectively (see DYNATRACE 2018). A survey of IT professionals produced similar results: 66 percent of respondents feel overwhelmed by the increasing IT complexity in the workplace. In view of new technologies, new hardware and increasing requirements, the majority of IT professionals are wor-

ried to lose control over corporate IT. 44 percent do not monitor their processes or lack knowledge to do so, while 18 percent of companies state that they lack the human IT resources to properly do so. 15 percent of companies name complexity of the IT environment as a reason for not fully monitoring their processes (see IPSWITCH 2016).

What hinders successful digital transformation most is that IT departments are understaffed and that IT professionals feel unable to adequately fulfill their work responsibilities. According to a survey of 52 companies by the Mechanical Engineering Industry Association VDMA, a third of the companies have an IT staff to employee ratio of 1:50 (see Figure 3). As shown in the Figure below, studies find a connection between a low IT staff to employee ratio and the positioning of the IT department within the company. If the IT department is merely a technology partner, it performs significantly fewer responsibilities than a business

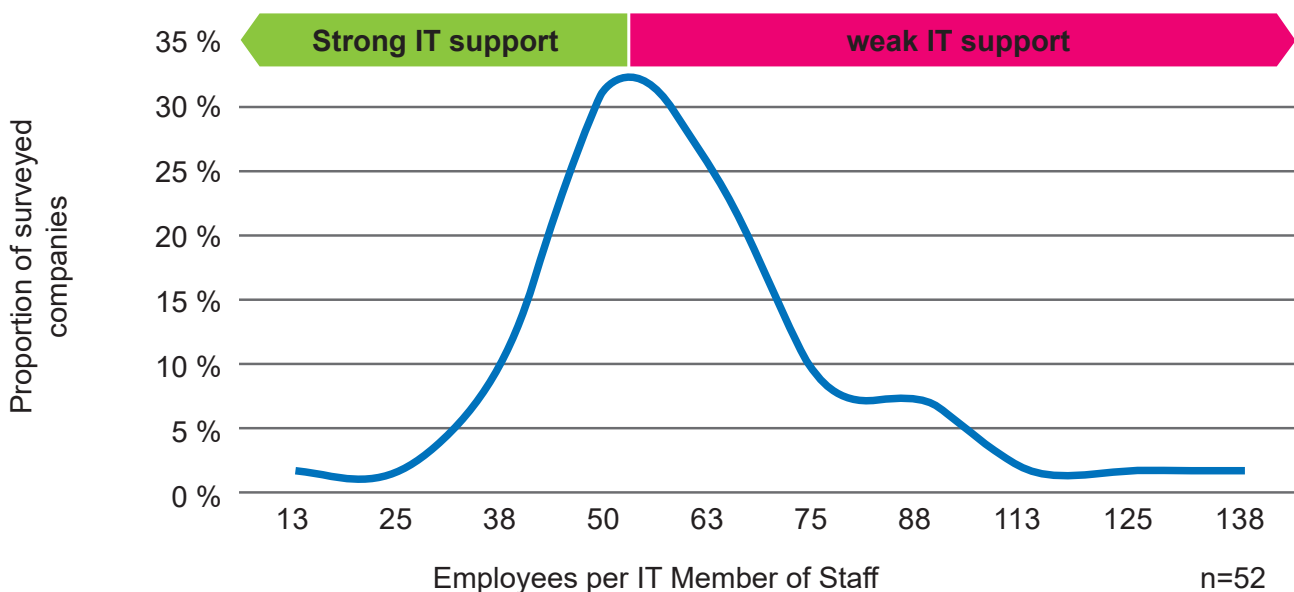


Figure 3: Ratio of employees to IT staff (adapted from HOFFMANN 2018, p. 176)

partner (see HOFFMANN 2018, pp. 176-177). Especially in small companies, such IT departments do not develop any IT strategy at all: in their everyday activities, they do not find the opportunity to do so, as they are busy performing administrative tasks.

For these reasons, the next chapters provide assistance with how to develop, implement, and consolidate an IT strategy with little effort. This allows your IT employees to focus on their key responsibilities and optimally support the future development of the company.



5 Approach to Developing and Implementing IT Strategies

The development of an IT strategy can be subdivided into four steps: First, the environment, which consists of the relevant stakeholders, the current state of corporate IT as well as the corporate strategy, needs to be analyzed. The results of this analysis highlight relevant fields of action. On this basis, the IT strategy is formulated. In this process, target pictures for individual areas and a vision for information management are developed. In a next step, at the operationalization stage, these target pictures are transposed into a project portfolio, which may result in modified or completely new IT systems and organizational structures. In order to be able to quickly identify errors or perform adjustments in case of changed framework conditions, the final IT strategy development step comprises of continuous monitoring and optimization.

For each of these four steps of IT strategy development, there is a host of individual methods that can be employed, depending on the current situation and the company (see Figure 4). In what follows, the most important methods, based on the experience of FIR, are presented and situated within the overall methodology.

5.1 Environmental Analysis

Market IT Roadmapping

By means of a stringent top-down approach to roadmapping, a first overview of the requirements on corporate IT can be obtained. In this process, three levels need to be taken into account: the level of corporate strategy in relation to the market environment, the level of required IT products and services, and the level of required IT competencies and information technologies.

In a workshop involving corporate and IT executives, based on the corporate strategy or a market analysis, topics/products/services are identified that will become relevant for the company over the next years. These topics will then be placed on a timeline. In a next step, internal IT products and services must be identified in order to provide for the implementation of the topics. These will be placed on the timeline as well (before the corresponding topic becomes relevant). Based thereon, at the third level, those IT competencies and technologies are identified which are required to be able to provide

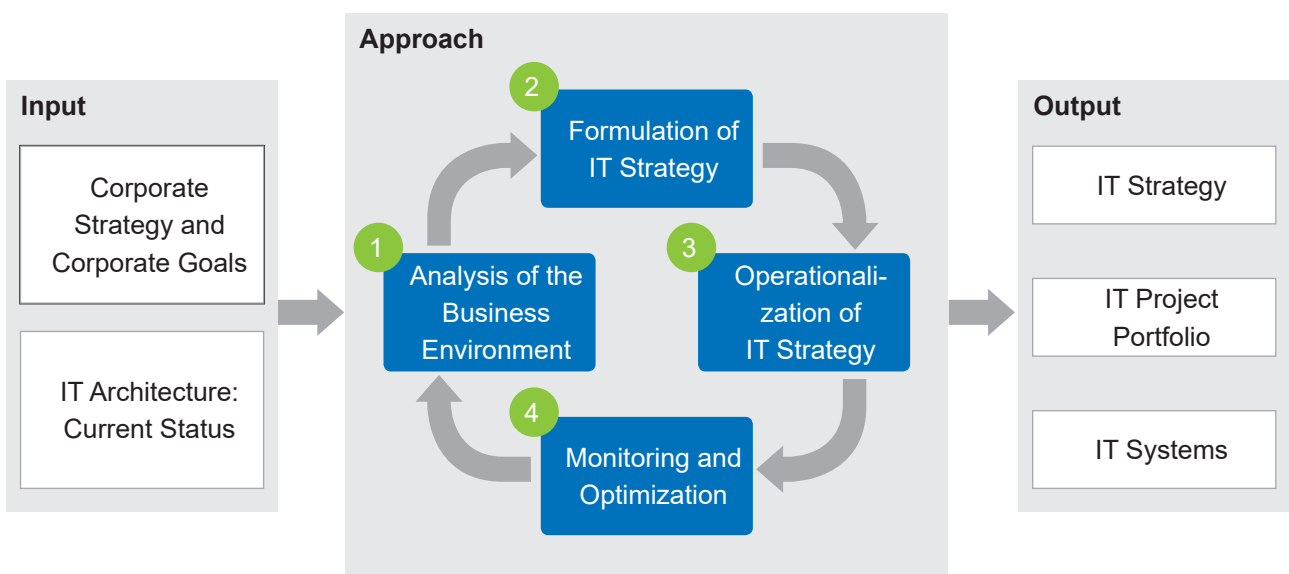


Figure 4: General approach to IT strategy development (taken from HOFFMANN 2018, p. 36)

the IT products and services and which have to be implemented, built or expanded. By means of this top-down approach, directly derived from business requirements, a first overview is generated, which highlights areas to be prioritized when further developing the corporate IT landscape.

Analysis of Strategic Business Goals

In addition to this roadmapping process, in many cases, an analysis of strategic business goals is recommended, as this takes also those internal objectives into account that do not have an impact on the market offering. The relevant objectives can be identified from the fully formulated corporate strategy or in a workshop involving the company's management. Moreover, an overview of already ongoing strategic projects should be created.

Based thereon, in analogy to the roadmapping process, an analysis can be conducted to identify areas in which the attainment of objectives requires contributions from corporate IT and what capabilities and resources have to be build or expanded. Beyond roadmapping, this analysis has a contrary impact as well as those topics that have an influence on corporate IT can now be identified (such as strategic cost reduction measures, for example, or planned company acquisitions that require the IT integration of both companies).

Perception of Corporate IT

For the description of corporate IT, there are four basic types that can be differentiated with respect to task, goal, planning, control, and organizational integration: *technology partner*, *process partner*, *business partner*, and *success partner* (see McFARLAN ET AL. 1983, p. 145-146; HANSCHKE 2016, p. 185). The more detailed descriptions of the types in Figure 5 are well suited to analyze the perception of corporate IT. First, representatives from the IT department should identify the type that best reflects the current role of their department, and what type of partner the IT de-

partment should develop into. The same assessment is to be made by the company's management from an external perspective.

If there are any discrepancies between the self- and external assessments, this can be the reason for possible dissatisfaction. Such discrepancies in perception are possibly due to the lack of clearly formulated requirements.

Technology Landscape

The analysis of the technology landscape aims at identifying the information technologies currently deployed by the company. It serves to identify potentials for standardization and to obtain an overview of internal technology experience and know-how. Moreover, it allows to identify technology approaches for additional use cases in the company. To this end, the technologies have to be clustered, i.e. assigned to specific use cases. It may be useful to classify them according to architectural layers and technological clusters, for example, and, in a next step, to analyze whether there is any unnecessary technological diversity within the layers.

IT Systems Map

The analysis of the IT systems is performed with the help of an IT systems map. The IT systems map, also termed IT development plan, represents the IT-supported business processes; it provides the link between IT systems and business processes (see DURST 2007, p. 39). The structure of the IT systems map depends on the individual use case; it can be structured according to core processes and departments, for example. In case of cross-site analyses, in analogy, the map can be structured by core processes and sites. If a higher level of detail is required, the IT systems map can be subdivided into process steps including the involved departments. Figure 6 (see p. 20) shows an IT systems map representing the different functional units and core

	TYP I Technology Partners Low significance of IT for the achievement of corporate goals	TYP II Process Partners Focus on maintenance, operation and further development of IT	TYP III Business Partners The goal is to create a high-performance information infrastructure	TYP IV Success Partners Attainment of competitive advantage through IT
	IT is a cost factor	IT contributes added value	IT makes a strategic contribution	IT makes a profit contribution
Task	Internal supplier of IT commodity products, e.g. provision of end devices	Support of core business processes; cost-efficient and reliable IT base operation	Standardization of the IT support of business processes for optimization purposes	Creation of long-term IT structures which facilitate changes to the core business
Objective	Reduce costs (IT is a cost factor)	Increase efficiency	Achieve effectiveness	Actively contribute to the development of new business models
Focus IT Control	Cost reduction & daily operations	Added value, cost/benefit and “operational excellence” benchmarks	Added value and contribution to strategy; cost/benefit	Added value, contribution to strategy and corporate success; cost/benefit
Focus IT Planning	IT reactive efficiency	Operational IT planning based on the business plan; corporate efficiency through IT; transparent IT landscape	Integration of business and IT planning; strategic planning of the IT landscape; efficiency and effectiveness	Integration of business and IT planning; proactive planning; effectiveness, future viability, and efficiency
Organi- zational Integration	Head of IT not involved in corporate management	Head of IT reports to an Executive Board member	Head of IT is Executive Board member	Head of IT is Executive Board member

Figure 5: Different types of corporate IT (authors' own elaboration)

processes. IT systems maps can be expanded to include an overview of the interfaces of the represented IT systems and a classification of interfaces into manual, partly automated, and fully automated interfaces.



Figure 6: Example of an IT systems map (authors' own elaboration)

IT Support

From the perspective of the functional units, the degree of support from corporate IT can be assessed at two levels, namely the technical level and the organizational level. At the technological level, the overall support of core processes through IT is to be analyzed. This, however, is only possible if detailed process documentation is available. Figure 7 shows a comparative analysis of the IT support of a core process across different corporate sites. It was analyzed how many steps of the core process were actually performed in a core IT system and which steps were performed manually or using other tools, such as MS Excel. On average, 38 percent of process steps were performed within a core system. The results varied considerably between the sites,

with values between 23 and 46 percent. This example illustrates that a comparison of different sites and a comparison of different processes are very well suited to identify areas with the greatest need for action.

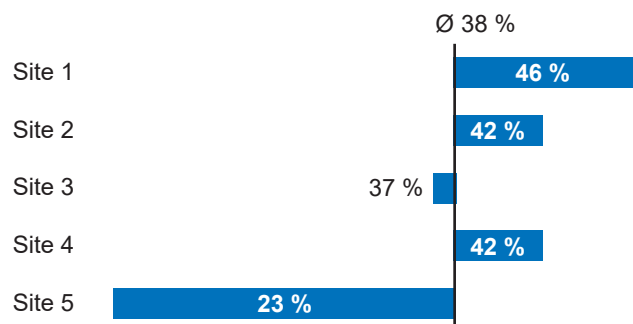


Figure 7: Analysis of IT support for a process (authors' own elaboration)

The quality and extent of organizational support from the IT department is reflected by how it is perceived by the organizational units. Thus, it is worthwhile to conduct user surveys to assess general satisfaction with the IT department, which is largely based on the perceived quality of user support, and to identify the topics with which the department is associated. It may be useful to cluster these topics to find out whether the department is seen more as a hindrance than as a solution provider known for its expert knowledge and/or its understanding of business processes.

Organization and IT Tasks and Responsibilities

In addition to technical aspects and the perception of corporate IT, the third important area of analysis is the corporate IT. It is particularly useful to view the corporate IT from the perspective of the different tasks and duties it has to perform. It is im-

portant, however, to investigate all departments regarding their information management related tasks. To this end, the Aachen Information Management Model can be employed (see Figure 8). It includes all relevant information management tasks and facilitates an analysis of which of these tasks are actually performed within the company. At the next level of detail, it is identified which tasks are performed by which units or divisions. If a task is performed by multiple units, this begs the question of whether the distribution of tasks is inefficient or whether there is good reason for it.

For each task area, the topics under investigation can be explored in more detail, including on the quality of task performance. Concerning the areas of *Operation and Maintenance*, for instance, an analysis of helpdesk tickets may help identify areas and topics that require the most IT support, and further insights can be gained by measuring average solution times.

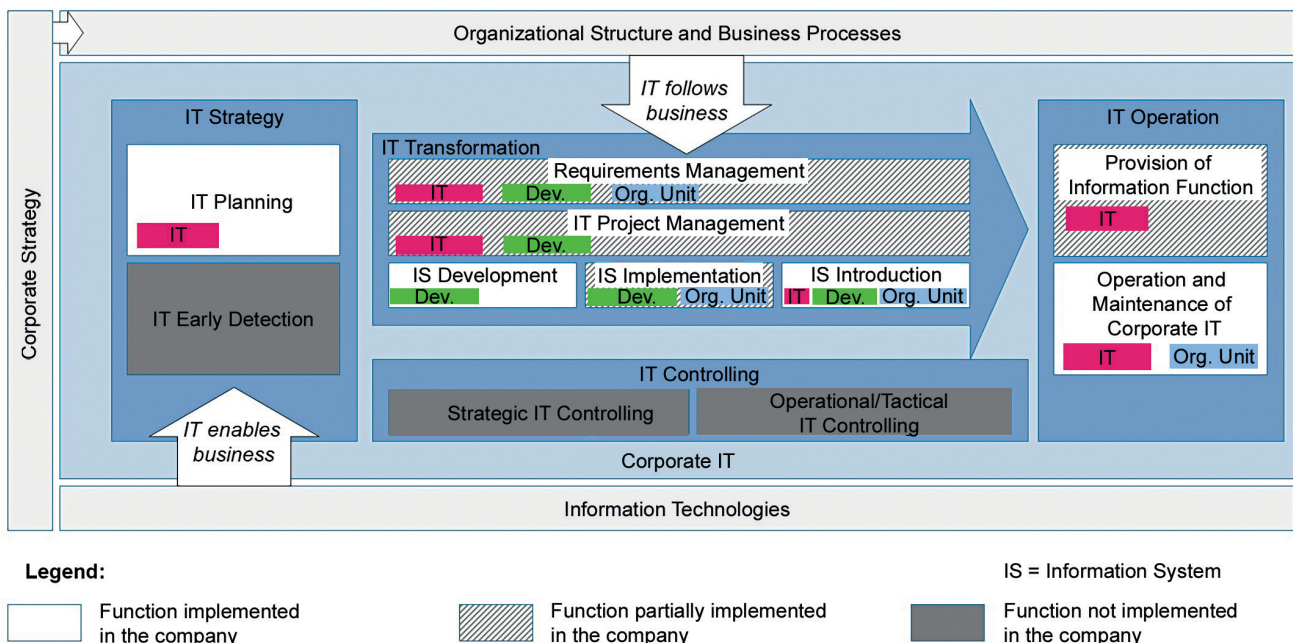


Figure 8: Distribution of tasks and responsibilities with reference to the Aachen Information Management Model (authors' own elaboration; see also DEINDL 2013)

5.2 Formulating the IT Strategy

The IT strategy is developed following a top-down approach. First, the IT vision is defined, which serves as a guiding light for the IT strategy. The vision should fulfill a number of functions: it should provide guidance, motivate staff, assist in developing the team and spark creativity. As developing an IT vision requires creativity, creativity techniques such as brainstorming or design thinking are to be used. An environment that is conducive to creativity is also very helpful when formulating the vision. On several levels, the IT vision points the direction for the development of corporate IT for the next five years. The IT mission complements the IT vision and provides guidelines for action in the present. It defines values, outlines overarching tasks, and describes the IT culture. It can provide concrete information, for example, on how the concept of quality is defined with respect to corporate IT, and how routine communication is managed. Furthermore, the IT mission can formulate ideals for the self- and external perception of IT employees and their work (in terms of Figure 5, see p. 19).

Based on the identified fields of action and the IT vision, concrete objectives are derived. The defi-

nition of objectives is guided by the SMART goal-setting technique, according to which goals need to conform to the criteria of “specific,” “measurable,” “accepted,” realistic,” and “time-bound.” This means that objectives are described clearly and precisely, that progress is quantifiable, that the goals are accepted by all those involved and can be attained that they can be attained within a clear time frame (see JOHANNING 2014, p. 38). When formulating goals, it is important to keep in mind that goals are means to an end, and not ends in themselves. Goals should be attainable and compatible with a rational economic analysis of the company’s situation. Furthermore, they should be in line with the primary goal of running a profitable business. In a next step, based on the strategic goals, and IT strategy map can be created. This map visualizes relationships and interdependencies between the different IT objectives (see MANGIAPANE A. BÜCHLER 2015, p. 141).

For a detailed description of the desired target state, target pictures are developed for central corporate IT dimensions. These illustrate what the corporate IT should look like after implementation of planned objectives. Instead of a detailed text document, as proposed by some authors (see WINTERSTEIGER A. TIE-

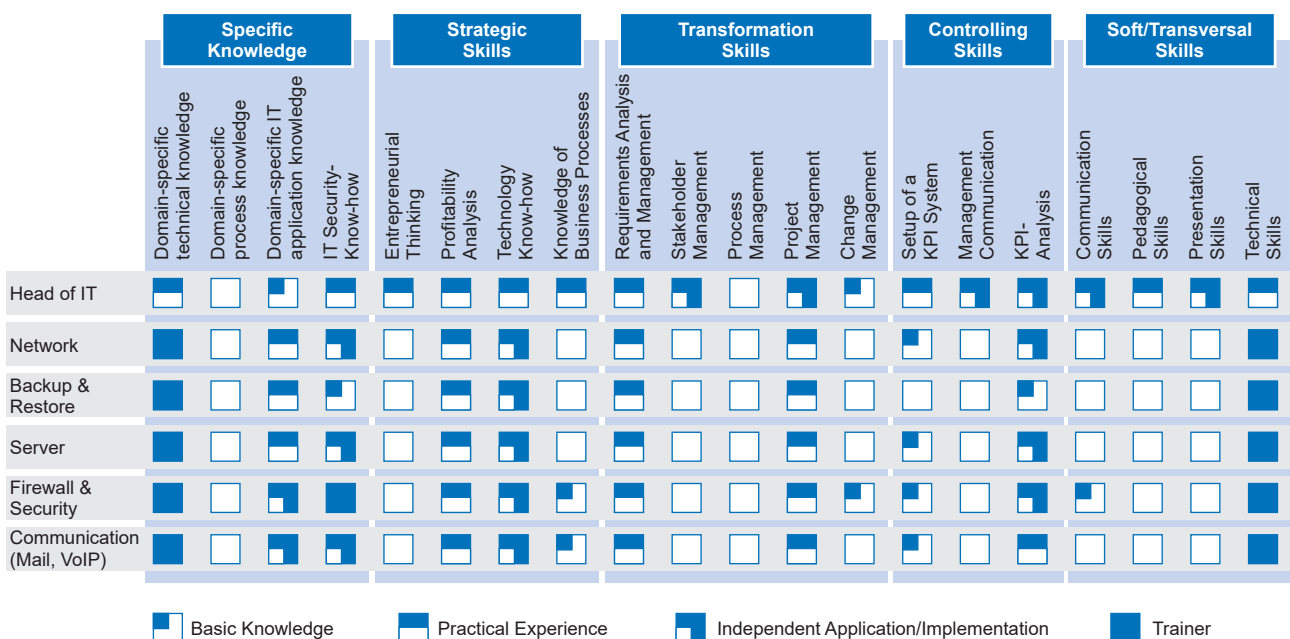


Figure 9: Task-based competency profiles (authors’ own elaboration)

MEYER 2017, p. 61), visual representations are better suited to communicating the key objectives of the IT strategy. Such target pictures should be, at least, created for the following dimensions.:

IT-Organization

Based on the analysis of the various IT tasks, it must be defined which business unit is responsible for which task. In more detail, for each individual task, a competency profile is created, which makes it possible to group individuals tasks into roles. Figure 9 shows a competency matrix, which represents the different degrees of competency for a certain role. With the help of such role descriptions, in combination with an assessment of current employee competency levels, decisions can be made as to which employee is best suited for which (possibly new) role profile, in which areas training is required, and for what roles new staff must be hired.

Based on the task allocation, which defines the scope of tasks to be performed by the IT department itself, the future location of the department within the organizational structure is determined. In addition to the organizational positioning of the department, it is important to determine how to organize communication and collaboration with units that have information management responsibilities. This does not necessarily require formal line management structures; often it is sufficient to establish regular communication processes to ensure the timely exchange of information. The target image can be visualized using an organizational chart which additionally displays regular paths of communication.

IT Systems Map

The target image of the IT systems map is developed based on the "as-is" situation (see Figure 6,

p. 20). The IT systems are differentiated into:

- 1) IT systems that remain "as are"
- 2) IT systems that are to be replaced
- 3) IT systems that are to be expanded

and marked accordingly. Furthermore, if the introduction of new systems is planned, these can be added as well. Some basic considerations provide orientation when deploying a new or modified IT environment. On principle, of each system type, there should be only one system in place – one ERP system, one CRM system, etc. Frequently, legal provisions, in particular regarding book keeping systems in international companies or customer requirements, demand a certain diversity of systems. This diversity should be kept to the minimum. Furthermore, the number of IT systems involved in a key process should be kept as low as possible – ideally, each key process should involve only one IT system. This makes it easier for staff to master the systems and helps optimize system utilization. Technical considerations, such as the operational security of IT systems and compatibility aspects, are also to be taken into account when designing the IT system landscape.

Data Architecture

The data architecture design process provides additional information to the IT systems map, focusing on the data fields to be used in a company. It specifies which data are to be stored by which systems, and where interfaces provide access to stored data. Figure 10 (see p. 24) shows an example of such a data architecture.

The data architecture should be designed in such a way as to:

- 1) prevent data redundancy wherever possible
- 2) define core IT systems for each key data item
- 3) be implementable using existing IT systems without incurring unnecessary expenditure.

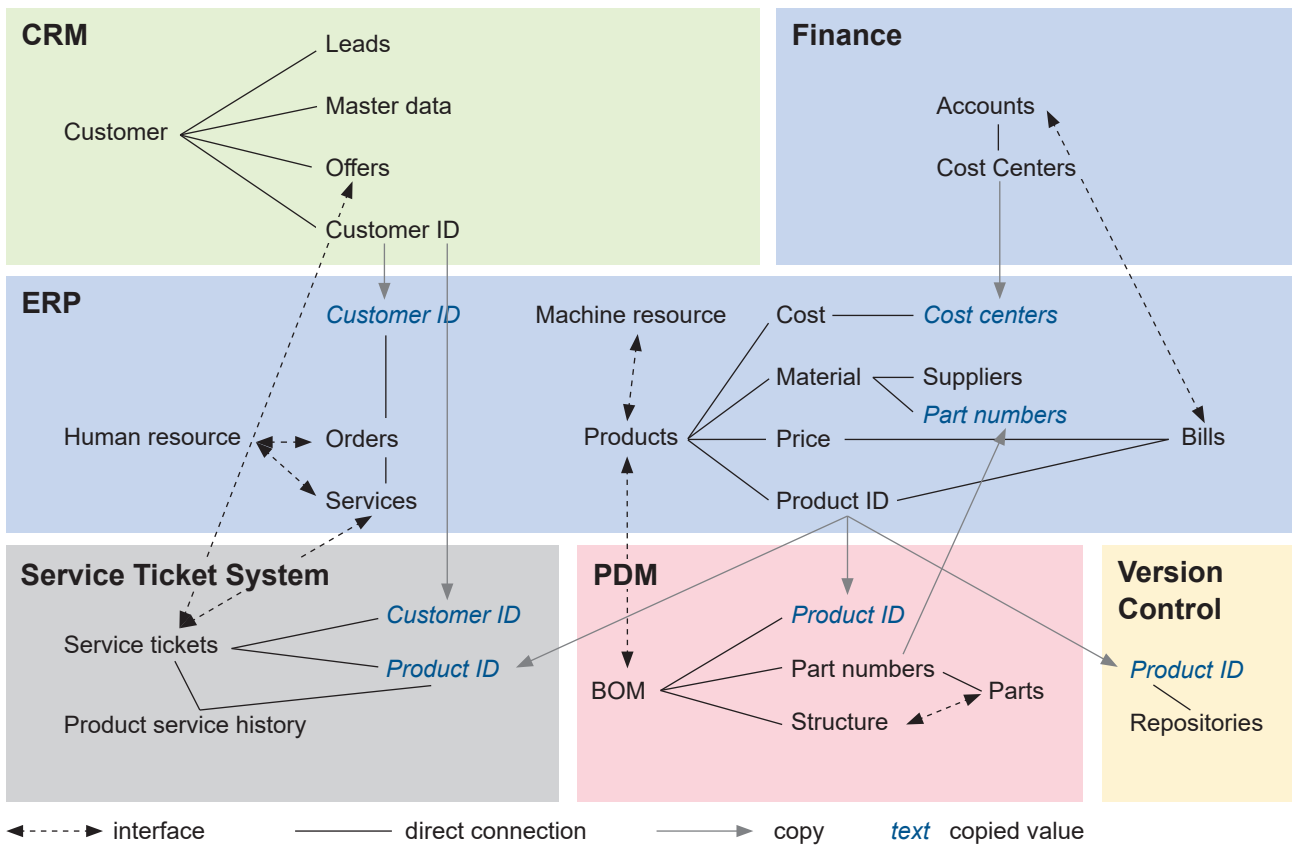


Figure 10: Example of a data architecture (authors' own elaboration)

Technology Landscape

The technology landscape is further developed based on the current "as is" situation, taking the IT vision into account. A key driver of change is standardization. Highly specific use of information technology should only be made where it is required to achieve competitive differentiation. Otherwise, standards should be implemented, e.g. for servers, laptops, or switches, in order to minimize maintenance expenditure and create purchasing leverage. This also makes it easier to outsource services to external providers.

Further Target Pictures

Furthermore, the IT strategy can include smaller-scale target pictures, e.g. concerning the integration of acquired companies or IT support for a certain department. In addition, it may define objectives for areas such as interface- or IT security architecture. All in all, however, the IT strategy should be manageable in scope in order to provide a useful guideline. If it is too comprehensive, employees may not fully understand or refrain from reading it.

5.3 Implementation

In the implementation phase, individual projects are derived from the target pictures. If IT strategy development is not “lived,” i.e. conducted on a continuous basis, but takes place intermittently in temporary projects, typically a great need for transformation is detected. As a result, many projects are initiated; these are to be prioritized and their implementation planned in an order that is manageable for the company.

Based on a cost-benefit analysis, the projects can be prioritized and a time plan established. Subsequently, resource bottlenecks are to be identified and addressed. In this process, the resources of the IT department, of the relevant organizational unit, and of the involved services providers

must be taken into account. It is recommended to prioritize projects that can be completed with reasonable effort and that have a strong positive impact: this has a positive internal marketing effect and motivates employees to implement the IT strategy.

In addition to such internal marketing efforts, other change management activities are decisive for successful strategy implementation. With reference to the four dimensions of change management (see Figure 11), the systematic process outlined so far takes the dimensions of “vision” and “participation” into account. In addition, to support an engaged workforce, it is recommended to keep employees informed through regular communication. Furthermore, employees should be trained and qualified by key users and change agents.

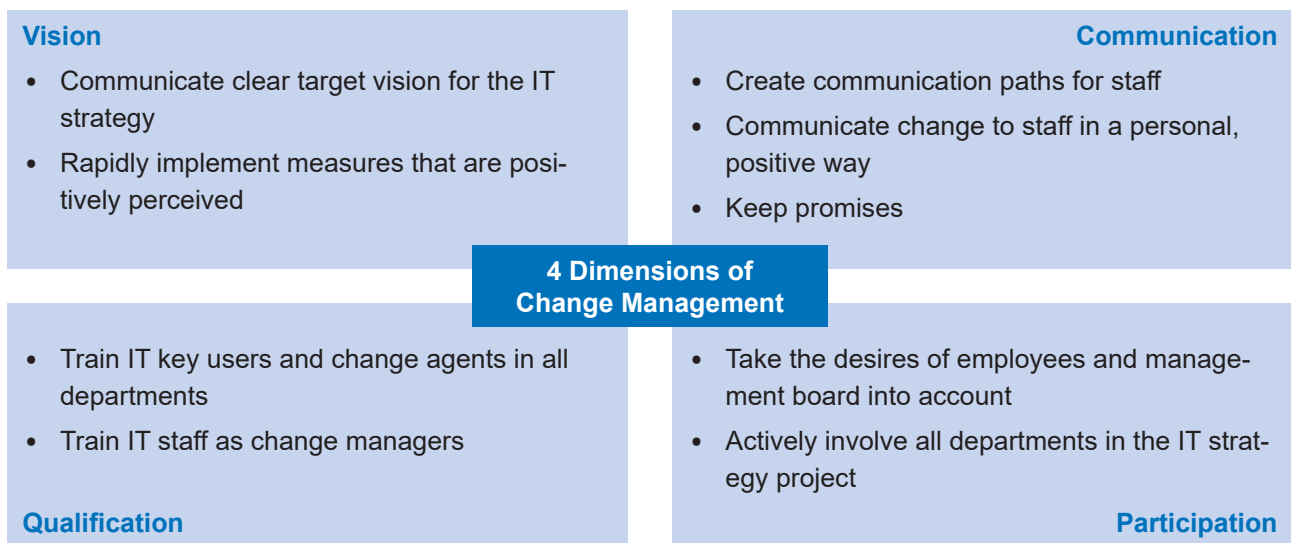


Figure 11: Dimensions of change management (authors' own elaboration)

5.4 Monitoring

In the monitoring phase, progress in implementing the IT strategy is assessed and, if planning turns out to be unrealistic or relevant framework conditions have changed, the strategy adjusted accordingly. In this process, it is advisable to have a decision-making body in place; otherwise, the decision-making process itself may turn into a time-consuming bottleneck. If such a decision-making body does not exist, a (at least temporary) decision board should be established for IT strategy implementation. This board should comprise members representing the perspectives of the involved organizational units, the IT department, the corporate strategy, and the IT strategy. Issues to be decided by this board may be diverse and include the (re) prioritization of projects, resource allocation,

implementation of organizational changes, selection of IT solutions, and selection of IT service providers.

Project portfolio management constitutes the most important monitoring tool. Based on the initial project planning within the operationalization phase, portfolio management becomes a continuous task. The portfolio management role must act proactively and, if necessary, intervene. To this end, proven Kanban principles, such as limiting the amount of work in progress and increasing throughput rates, should be applied. In this context, other goals are to prevent that too many projects are launched at a time and to focus on completing individual project strands as fast as possible. This requires a shift away from rigid annual planning and the performance of multiple portfolio adjustments per year.

6 Application in a Concrete Strategy Project

Supported by FIR at RWTH Aachen University, HAHN GROUP, a special mechanical engineering solutions provider, has reorganized its IT and digitalization functions, with the aim of achieving an international standardization of internal processes. The goal of the collaboration was to create flexible, but at the same time standardized and site-independent, IT structures.

HAHN GROUP, which specializes in industrial automation solutions with a focus on the automotive industry, has recently experienced rapid growth: in addition to achieving strong organic growth, the company has successfully introduced several new portfolio additions. This portfolio expansion resulted in an initially heterogeneous IT infrastructure and an IT applications landscape. However, HAHN now seeks to exploit the added value of integrated, seamless solutions and drive digitalization across the organization. For these reasons, historically grown IT structures and processes are being consolidated.

The long-term strategic goal of the HAHN GROUP is a new positioning of corporate IT, which is no longer to be considered a mere support services provider, but a partner contributing to driving the

economic success of the entire corporate group. This required to initiate a full organizational and technological transformation process. To provide an organizational framework, an IT Shared Service Center was introduced, serving as an overarching service center for the consistent support of all core IT systems and providing a homogeneous infrastructure across all company sites. The organizational restructuring and standardization results in clear communication paths between the companies of the group and an optimization of operating costs through the standardization of processes. The Shared Service Center is set to become the central point of contact for all IT tasks.

The first step of the implementation consisted of a mapping of all core processes and their IT support on site, which formed the basis for modeling the current IT systems map. In a next step, the concept for the target IT systems map and the target organization was developed. Shared services, provided by the centralized corporate IT, are to be made available in the area of infrastructure and helpdesk support. In future, they are to cover the major share of all IT requirements of the entire corporate group.

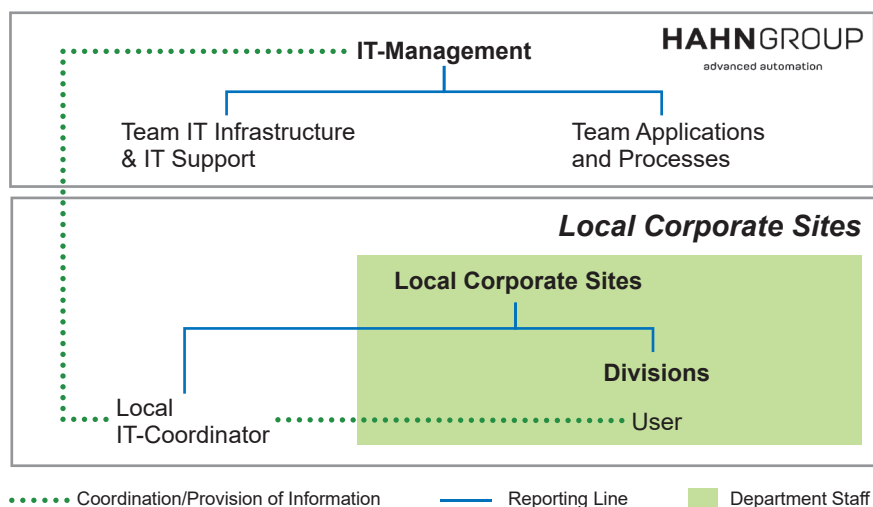
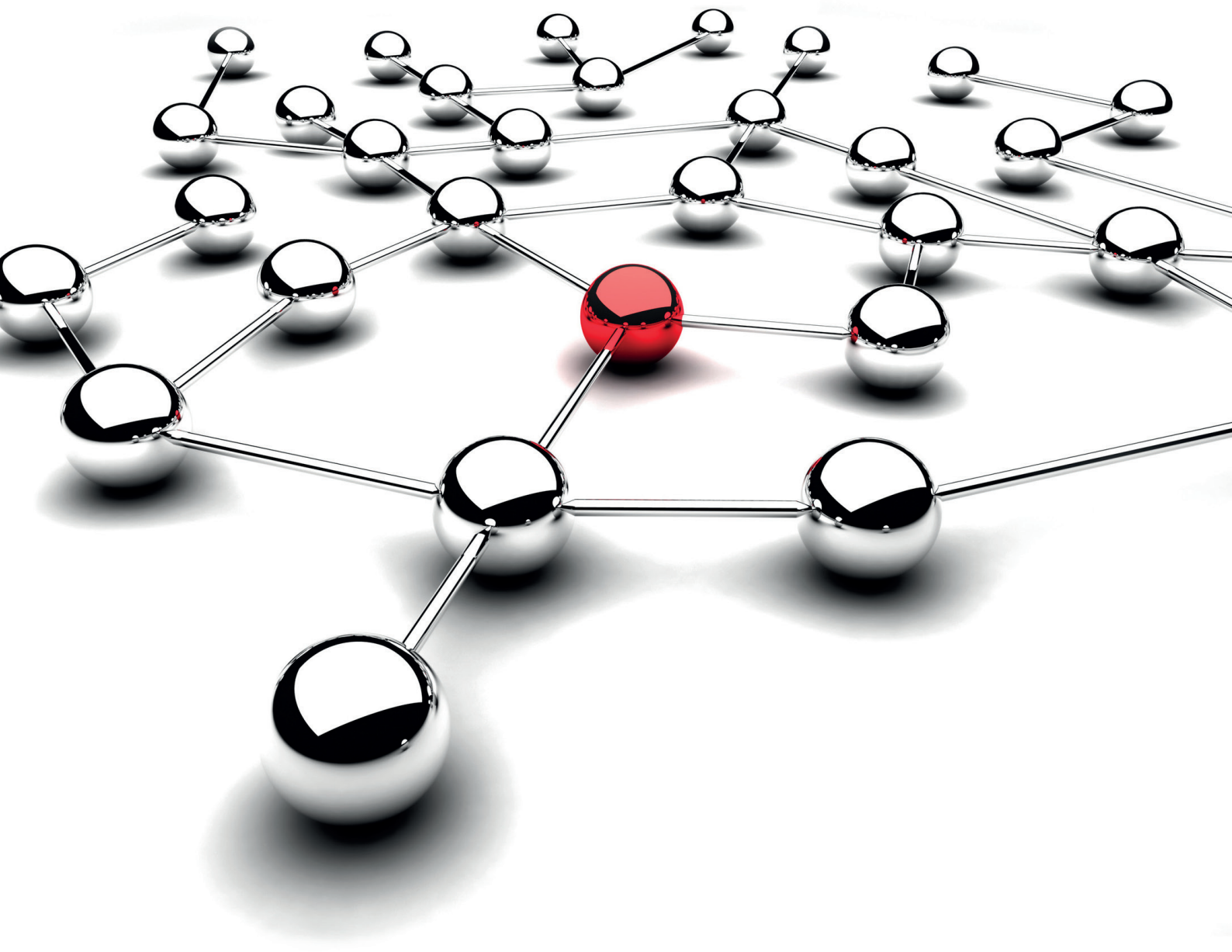


Figure 12: Overview of the envisioned organization structure for the HAHN GROUP (adapted from HOFFMANN AND BLEIDER 2018, p. 50)

Furthermore, in the area of IT organization, we defined a distribution of competencies, without overlaps, between the centralized Shared Service Center and the IT departments of the group's different corporate sites (see Figure 12, p. 27).

By establishing the Shared Service Center, corporate IT is provided with the required equipment and competencies to support, as a success partner, all core processes of the corporate group. Re-

levant topics are driven by top-level management. An increased transparency of IT investment decisions, shortened response times of the IT helpdesk through increased and internationally distributed capacities as well as clearly defined responsibilities, for centralized IT applications across the entire company improve the perception and acceptance of IT within the entire corporate group. Corporate IT, thus, acts as a strong business partner and support for the HAHN GROUP.



7 A Glimpse of the Future

Primarily driven by new technologies, the world of information technology has always been rapidly changing and evolving. This will hold true in the future: new technologies such as augmented reality, artificial intelligence, distributed ledger technology (such as its application Blockchain), and the new 5G mobile communications standard are increasingly becoming available and have already found their way into industrial application.

At the same time, existing technologies are standardized and simplified to such an extent that they are becoming commodities – products for everyday use. This means that highly specialized IT departments have to be less concerned with known technologies, but should focus on new and emerging technologies. Thus, the IT organization must be kept aligned with a moving target that needs to be continually reassessed. This is an ongoing process that requires the IT department to constantly pose the question as to whether to offer a certain service itself or to commission

an external standard provider. This development can be currently observed in the area of “server operation”: storage space and computing power can be easily obtained from so-called “cloud providers” – as a result, is worthwhile to run one’s own servers in exceptional cases only.

Looking further into the future, we expect the emergence of IT systems that can be modified by the user to an even greater extent than today. With the help of methods such as visual scripting, users become developers, capable of directly adapting their processes in the system. Moreover, IT systems will become better capable of learning what information users need and, as a result, be able to autonomously provide them with the desired information. This concept of an autonomous information logistics, however, requires the comprehensive integration of existing IT systems. Given these development, it becomes clear that there will be plenty of work for the IT department in the future.

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9 FIR – A Competent Partner in Practice



FIR, the Institute for Industrial Management at RWTH Aachen University, is an independent institution for applied research [in the fields of business organization and information logistics]. For more than 60 years, as partner of business and industry, FIR has been developing guiding principles for modern business organization. Through the FIR Research Association, which counts about 120 businesses and industry institutions as its members, about 50,000 companies and 35 additional member organizations of the Federation of German Industries (BDI) benefit from the transfer of research results into practice. Heading the Smart Logistics Cluster on RWTH Aachen Campus, FIR promotes the collaboration between the associated enterprises.

The FIR Department of Information Management develops methods and tools for the management of IT complexity in enterprises. These include the IT strategy development methods outlined in the present paper. Drawing on the latest research, these methods and tools are constantly further developed and applied in industrial consulting projects. Moreover, FIR offers educational offerings for professionals on these topics. For further information, please do not hesitate to contact us at IT-Strategie@fir.rwth-aachen.de.

