



# Shaping the Digital Capability Driven Architecture

PwC CIO Advisory Services



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# Success of Digital Transformations depends on a mature Architecture Capability design

**To become a sophisticated player in today's race towards digital readiness, companies need to be prepared for the changes they have to undergo when introducing (digital) business models based on new technologies such as IoT, Machine Learning or Robotics. This paper helps to understand how a capability-driven architecture approach supports organizations to overcome those challenges by presenting best practice approaches and blueprint reference models ready for Digitalization.**

Capabilities define the skills a company needs to successfully perform its business activities and deliver the desired business value. In this light, a capability represents the combination of processes, tools, knowledge, skills, and organization, which a company needs to operate in their chosen way. They define how you face the market and create value for your customers.

A capability framework is comprised of differentiating capabilities - the key strengths that set your organization apart from its competitors - and commodity capabilities - the functions which are needed to support your business model but do not differentiate you from other organizations.

Typically, capability frameworks organize capabilities by business domains (e.g. HR, Finance, Sales) and then break them down into sub-categories or areas of the domains according to best practice for the industry they are operating (e.g. HR: Recruiting, Payroll). In terms of IT, capabilities define the functional perspective and scope of applications and technology needed to support the business model.



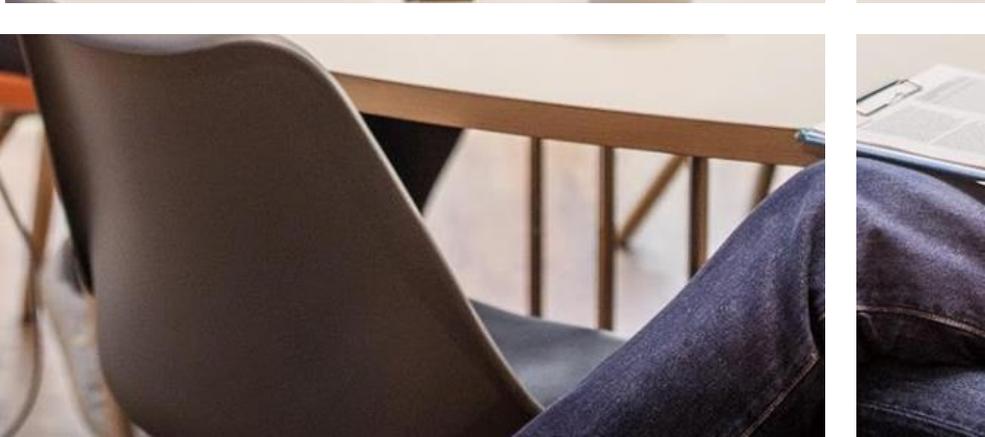
Using a capability driven planning approach, companies can create one enterprise view of their operating model - integrating people, information, process and technology - that enable the business to achieve its vision. In an ideal world, the framework of capabilities align all stakeholders from business and IT and guide strategic planning and decision-making in all areas of the organization.

Capabilities usually do not fundamentally change over time (e.g. because of reorganizations or outsourcing initiatives), as long as the business model does not need essential adjustments. However, when organizations plan to implement new technologies to create completely new digital products and services, the entire business model will change.

Lastly, we will discuss the concept of digital architecture readiness and new capabilities needed to be prepared for new disruptive technologies.

As a result, capabilities must also change - not only in the implementation of new technologies, but in all dimensions (people, information, process and technology). In addition, organizations have to introduce and operationalize new digital capabilities.

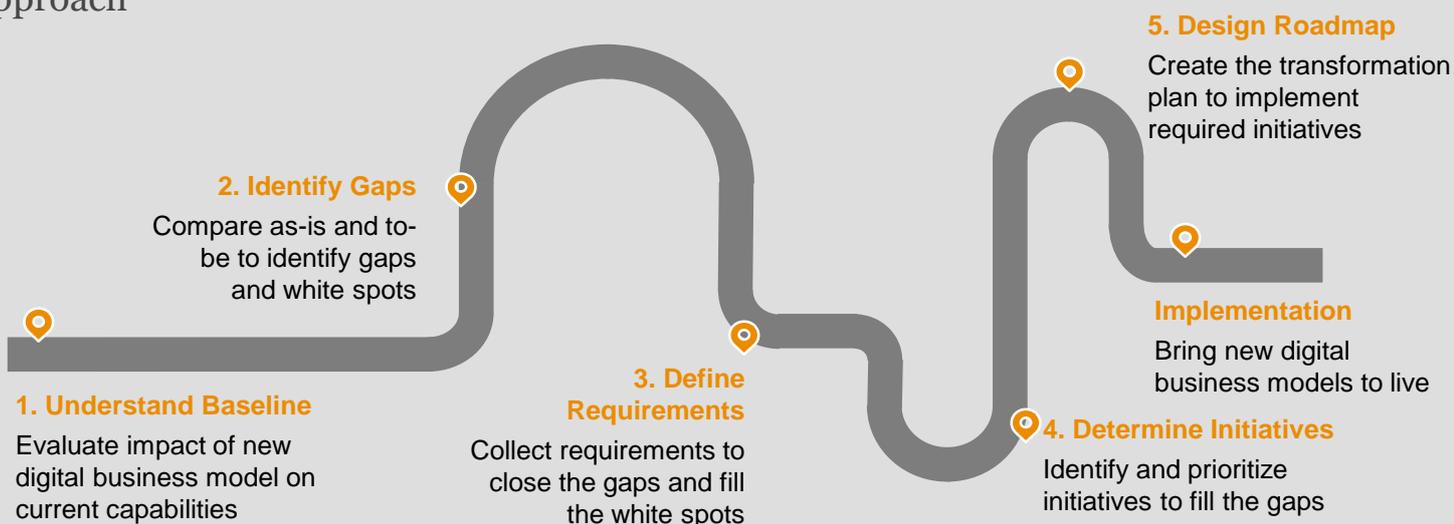
In the following chapters, we explain how to overcome the challenges: from assessing the current capability system to its fit for the new digital business model, to identifying gaps and white spots, to developing new digital capabilities.



# Using a Capability Driven Architecture Approach to analyze the digital readiness of your IT

The capability driven planning approach helps organizations to evaluate their current capabilities against the new business model, identify gaps and determine measures to close the gaps. For example, adding new capabilities might result both in acquiring new skills, making changes to the organization and implementing new technology. A consolidated transformation plan covering all aspects of the capability framework, helps to prioritize and implement the programs, initiatives and investments needed. Initiatives already underway that do not support the new business model will be canceled.

## The Approach



## Phase 1: Understand Baseline

The aim of this phase is to create a deep understanding of the impact of the new digital business model on the company's existing capabilities, both on the business side and within IT.

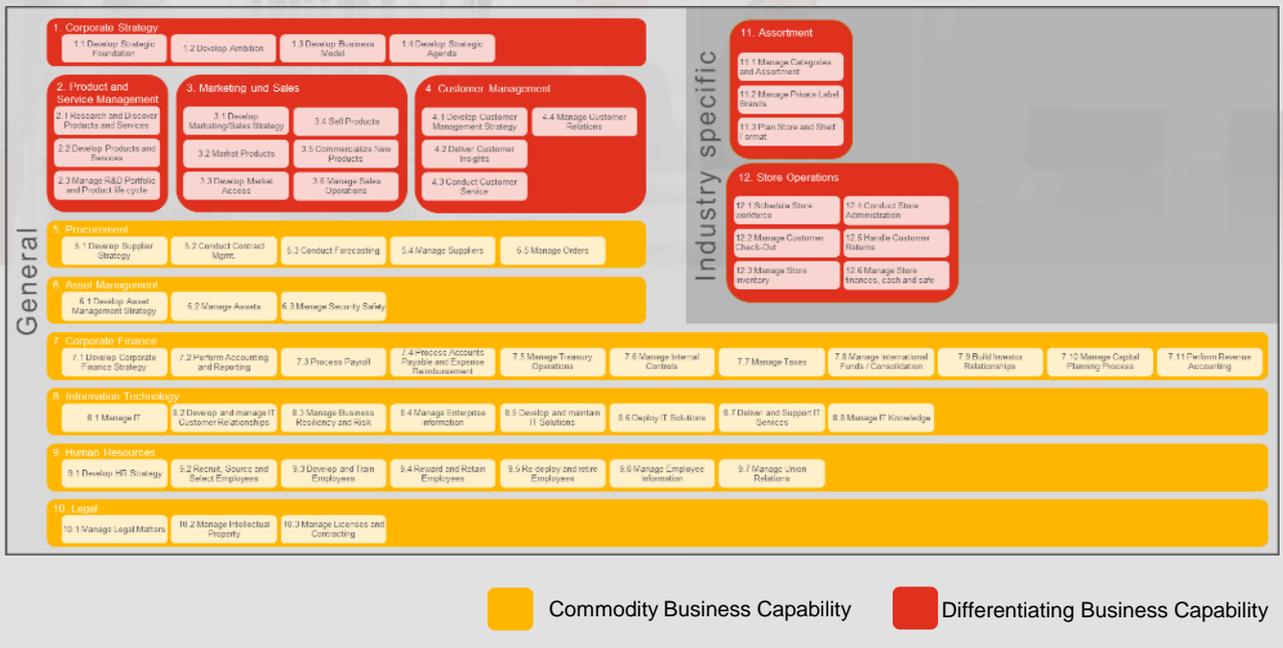
For this purpose, the current capability map must first be analyzed. If this is not yet available, industry-specific best practice models could be used and adapted to the specific circumstances of the organization.

Subsequently, the capability map must be assessed for its suitability with regard to the new business model. What skills need to be changed to deliver the new products and services? Are there any new digital capabilities that would be necessary?

A good starting point for this analysis is to compare one's own capabilities framework with (industry-independent) best practice models that focus on the digital capabilities needed to implement new technologies. One of these models is the PwC d Quarks model<sup>1)</sup>. This model supports in particular family businesses in digital transformation.



## Example Business Capability Framework: Retail



The result of this first analysis is the creation of a target capability map. It should contain all the skills and descriptions required to operate the new digital business model. The focus is on what the organization must do in the target state, instead of deciding how this should be achieved.

In this step, it is also important to assess which of these capabilities are truly distinctive and make up the organization's success in the marketplace - as opposed to capabilities that typically follow industry best practices.

One way of assessing this is to compare one's own capabilities with those of competitors. Truly distinctive capabilities should receive maximum attention and be developed in detail to meet the specific needs of the organization. Capabilities that are not significantly different from the competition should be developed using (industry-specific) best practices.

### Phase 2: Identify Gaps

The aim of the second phase is to compare the as-is and the target state. Further the aim is to identify gaps and white spots for each new capability.

In terms of the technology level, it must be analyzed whether the technical prerequisites for supporting the new capabilities are already in place and what effects the introduction of these will have on the existing system landscape.

At the IT infrastructure level, it must be examined whether the current server structures and network capacities are sufficient to support the new technologies to be introduced. If the new technology is to be operated in an external cloud environment, it must be clarified whether there are already contracts with corresponding suppliers or whether new ones have to be selected.



Existing interface technologies must also be put to the test. If point-to-point connections between individual applications or an enterprise service bus were previously used as an integration solution, an API management solution is often implemented when switching to a microservice architecture.

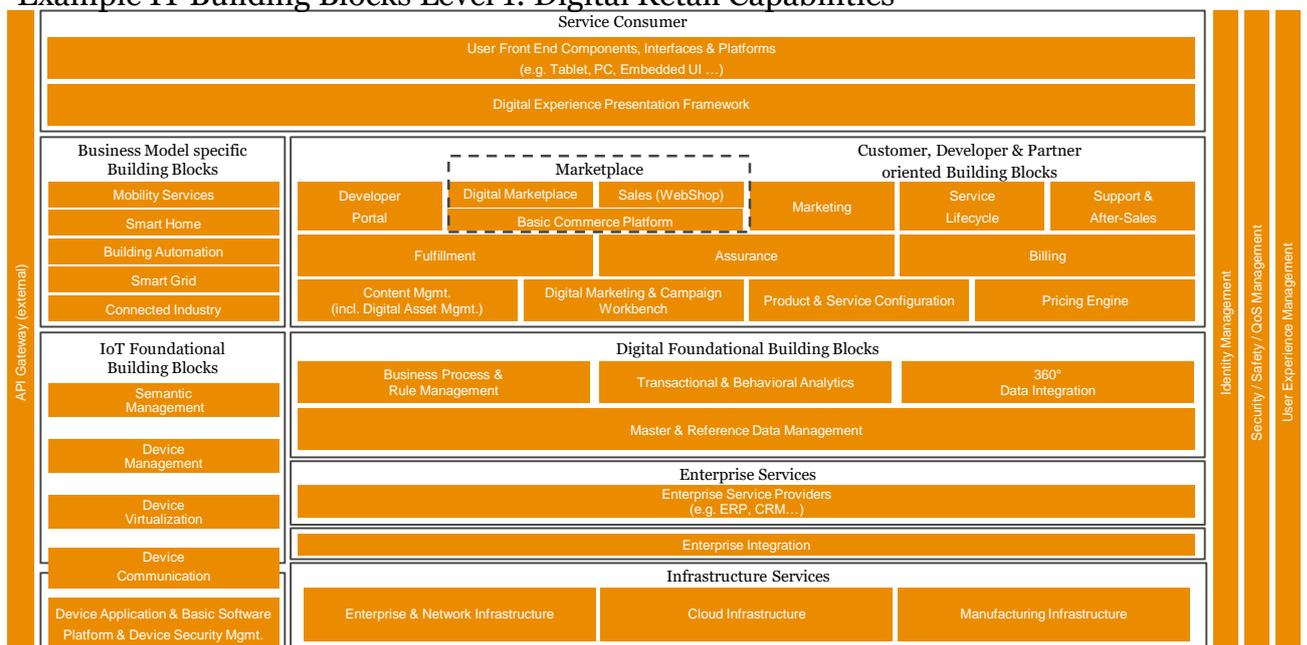
At the application level, it must be examined which solutions can be replaced by the introduction of the new technology if necessary and what influence this has on connected systems.

On the other hand, it must be analyzed how the new technologies can be integrated into the existing landscape and which solutions would have to be introduced in addition. This ensures that the new technology and the functionalities it brings can be used as to their full potential within the company.

Industry-specific IT building blocks can help organizations ensure that the analysis is complete. They illustrate which building blocks companies in the industry typically use to support their digital transformation. By mapping the organization-specific IT architecture to the generic reference architectures, missing functions can be discovered and integrated into the organization's target architecture.

However, a key success factor at this stage is to not only build the picture from a pure IT perspective but also involve subject matter experts from different areas of the organization. This helps to understand the realities and improves the engagement of stakeholders in the implementation of the new capabilities.

### Example IT Building Blocks Level 1: Digital Retail Capabilities



*All building blocks can be realized internal, external and cloud-based*



### **Phase 3: Define Requirements**

When the comprehensive list of gaps and white spots is ready and agreed by both SMEs and senior management, the requirements to close the gaps and fill the white spots have to be collected.

Each capability should be assessed along the capability dimensions people, process, technology and information to identify areas for improvement across each area.

It has been proven as useful to again perform this activity in working sessions with affected management and subject matter experts to validate the intersection of each dimension across the capabilities. Some of the capability requirements will be shared across different lines of business and enterprise and must be considered in respective groups.

Next, identify whether capabilities should be sourced internally or externally. For each capability gap, the best way to build or acquire the capability has to be determined.

Questions such as the following might be raised:

- Do these capabilities already exist in the organization or can they be build up in a feasible way in our organization?
- Is it more efficient to outsource the capability?
- For strategic, differentiating capabilities, how important is it to source the capability in-house?
- What technologies would be needed to build, innovate, and provide the capability?
- Do we need to build up new skills in the organization or can they be bought in?



#### **Phase 4: Determine Initiatives**

In Phase 4, the required initiatives to gain access to the distinctive capabilities and fill gaps have to be identified and prioritized. At this stage, it is useful to identify already existing initiatives and link them to the capabilities. Check if they already pay in to fulfill the new requirements or are even counterproductive to the new business model. It is important to further on consider all dimensions: processes, people, technology and information. Based on this analysis, new initiatives can be defined which will be required to fill the remaining gaps.

To prioritize the initiatives, appropriate business cases for each initiative should be built. Based on the assumed cost and benefits, and an analysis on how well the initiative contributes to achieving the targets, initiatives can be scored and a final initiatives portfolio built. The new portfolio should consist of both existing and new initiatives.

#### **Phase 5: Design Roadmap**

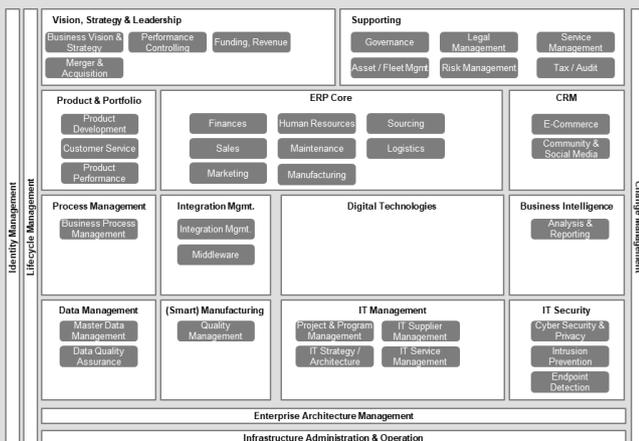
Finally, the transformation plan is defined for the implementation of the new capabilities. For this purpose, the interdependencies between the planned initiatives need to be identified. They determine the sequence in which the individual initiatives can be implemented.

Dependencies should be discussed in workshops involving representatives of all dimensions affected by a change in the capability. Only in this way can a holistic view of the planned initiatives be ensured: in the assessment of dependencies, but also in the later implementation.

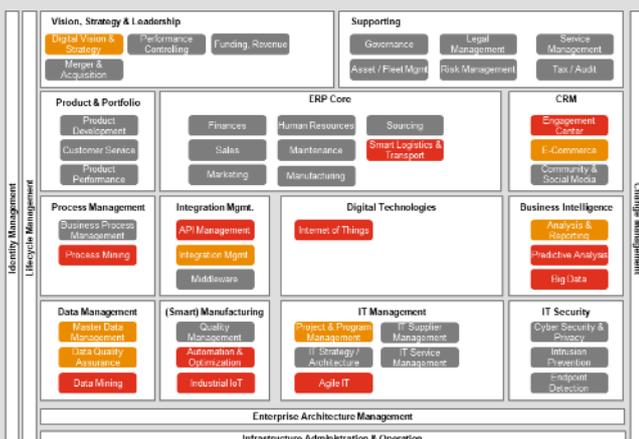
For this purpose it is useful to assign all initiatives to the individual dimensions that they change, such as organization, know-how, technology).

# Designing Digital Architectures and their influence on Capability maps

## From Existing ...



## ... to Target Capability Maps



- New Capability
- Enhanced Capability
- Existing Capability

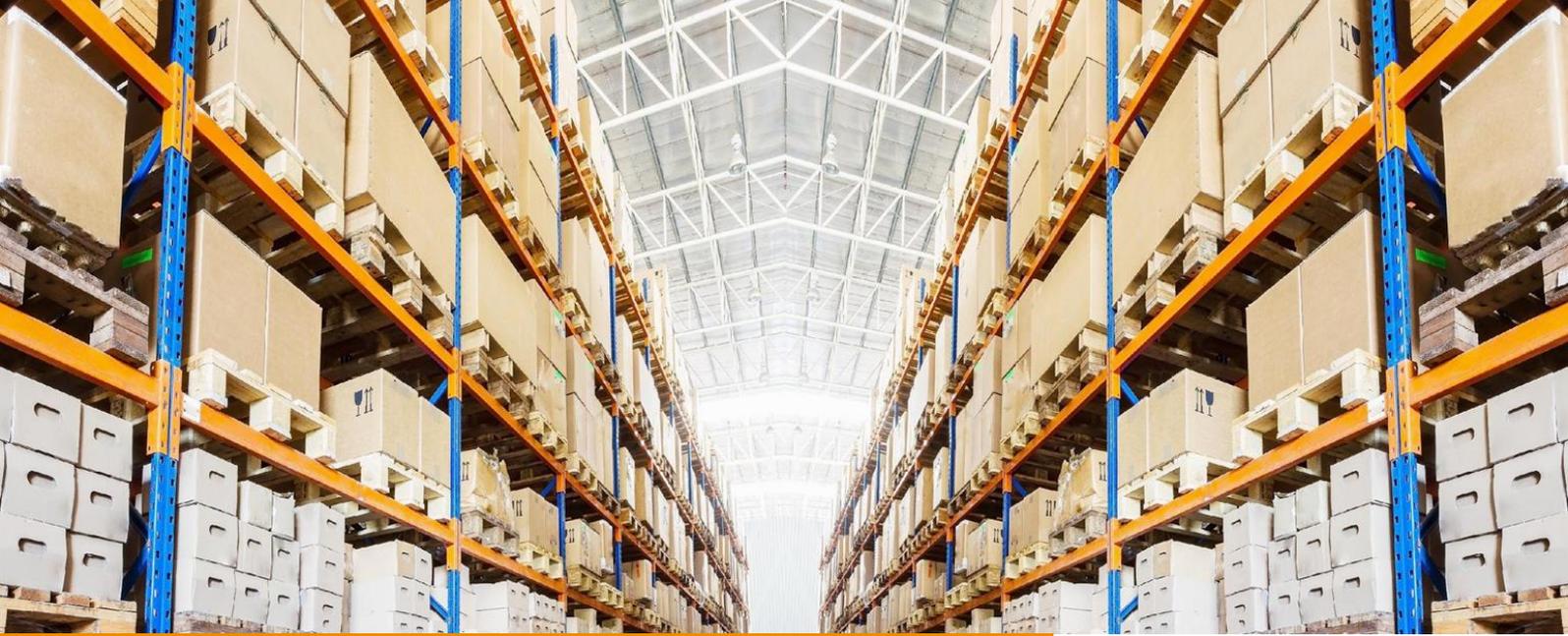
In the last chapter we have shown how a new capability map can be developed. Now we look at how such a digital capability map could look like that enables an organization to be ready for new disrupting technologies.

Digitization has many meanings. For some, it is the introduction of entirely new technologies such as artificial intelligence or robotics. For others it is also about modernizing their corporate structure (e.g. Lean), methods (e.g. Agile) and ways of thinking (e.g. Design Thinking).

From the point of view of capability design, digitization always has an impact on all areas of an organization: the introduction of new technologies should always go hand in hand with the adaptation of processes, competencies and organizational structures of a company that make up the capability.

The degree of change and the specific capabilities that need to be added or expanded must be defined specifically for each organization, each industry and each market and should ideally be defined based on the overall digitization strategy of the organization.

The following example illustrates the changes that are necessary in addition to the introduction of new technologies in the company.



A leading retail company has decided to introduce IoT (Internet of Things) as a new technology: In the future, warehouse management will be supported by a variety of different sensors that support the complete control of the warehouse itself as well as the inventories stored in it. In addition, an API gateway is to be set up for the introduction of API management, which supports the new IoT applications, but also the further development of existing applications towards a micro service architecture.

The introduction of these two new technologies will impact both the company's enterprise architecture and its IT integration strategy.

In order to ensure the long-term success of the introduction of these technologies, changes in IT processes and the IT organization are also necessary. This includes the introduction of agile development methods, adequate organizational structures and tools, as well as the general development of the necessary know-how and skills required for the further development and operation of the new technologies. In addition, applications that are to be supported by IoT must be (further) developed.

This means that in addition to adding new technical skills, other non-technical skills must also be included in the capability map. Therefore, in addition to the new IoT and API Management capabilities, the digital capabilities "Agile IT" and "Smart Logistics and Transport" have been added to the Target Capability Map.



In light of a large, but no longer scalable application landscape and complex data structures, as well as long development cycles due to demanding legal requirements, one of our customers decided to redesign its IT architecture.

The focus of this strategic project was to establish a new IT integration strategy with the aim of introducing a microservice architecture. In order to be able to react more quickly to new requirements, the individual services should be enhanced as separate applications. In addition, agile development methods were to be introduced.

It soon became clear what effects a non-exhaustive view on all aspects of the new capabilities could have on the success of the project. In the beginning, agile working methods were only introduced within the project team, but the rest of the organization continued to work with a classic waterfall model, with long planned milestones and fixed go-live dates. Misunderstandings and planning errors were thus pre-programmed, in addition to the technical difficulties inherent in the transformation of the architecture.

Only when they started to build the target capability map, considering the entire organization involved, and established a holistic change management program, the company was able to actually achieve the goals set.

This practical example shows that capability maps are necessary to take into account all aspects that the company needs to achieve its and strategic targets. During implementation, already defined capabilities can be changed, replaced, or removed from planning, but this is a normal process and leads to an optimized capability map ready for the digital age.

Be ready for Your Digital  
Transformation

Use the Capability  
Driven Approach to  
design a modern &  
feasible Target  
Capability Map and  
Roadmap.

For your successful Transformation

**Together, we will design your future.**

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