LEADING IN
PRODUCTION
EFFICIENCY

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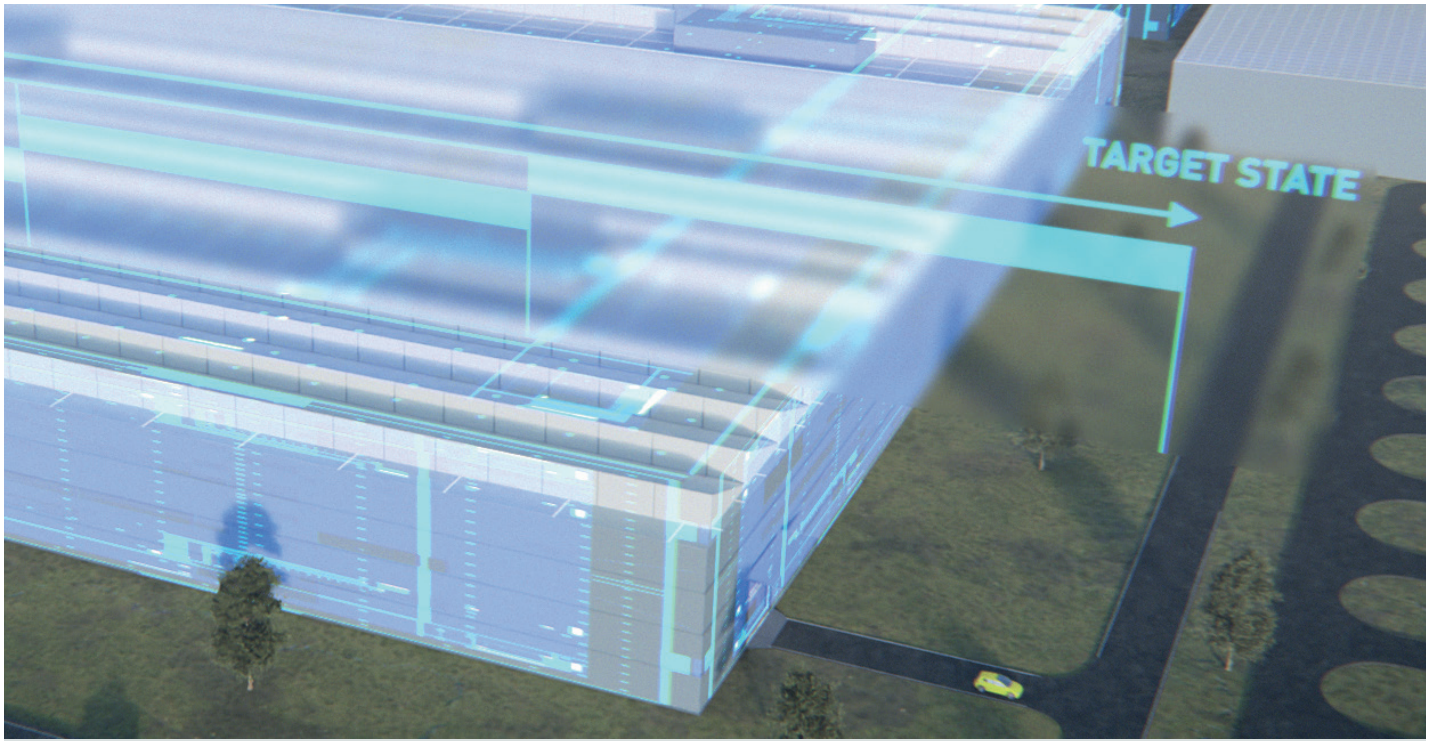

WHITE PAPER

Dürr Consulting

Digital Readiness Assessment

The digital transformation, which began as a subject of academic discussion, has now become a reality in the manufacturing industry. To develop a roadmap for identifying and prioritizing digitalization initiatives, it is essential to answer the following questions: "What position are we currently in as a company?" and "In what direction do we want to go?". The Digital Readiness Assessment from Dürr Consulting provides a structured answer to these questions and identifies specific recommendations for action on the basis of an industry benchmarking process.

BENEFITS

- Scientific, structured survey of the actual and target status of digitalization
- Comprehensive evaluation of seven organizational and technological categories within the company with more than 50 assessment dimensions
- Relative comparison of the company's digital readiness against other firms using an industry benchmarking process
- Fewer resources needed and quick results from the Digital Readiness Assessment

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Digital Readiness Assessment

INDUSTRY 4.0 – DIGITALIZING IN THE MANUFACTURING INDUSTRY

The history of the manufacturing industry is characterized by constant development and change. It has generally taken the form of continuous improvements made in small incremental steps. However, on several occasions an existing production paradigm has been replaced by a fundamentally new system. Some of these economic upheavals are now described as industrial revolutions. When we look back at our history, it is cle-ar that these were caused by technological leaps forward. For example, the first industrial revolution in the 18th century was triggered by significant improvements in the field of mechanics, such as the invention of the steam engine and the mechanical weaving loom. The second industrial revolution was made pos-sible by the discovery of electricity and the introduction of as-sembly line production at the start of the 19th century. The development of computers and programmable logic controllers in the 1970s allowed for an unparalleled level of automation in the production process. This shift towards automated manufactu-ring is now referred to as the third industrial revolution. Research institutions and businesses have identified the start of the fourth revolution as taking place in around 2015. In Germanspeaking countries this is known as "Industry 4.0 (I4.0)."

"Industry 4.0" is a broad concept and is used primarily to describe the digitalization of manufacturing brought about by the connection of production technology. The use of modern infor-mation and communication technology allows machines to be coordinated more precisely with one another and to be control-led more accurately. The data generated during production is collected and evaluated with the aim of introducing continuous improvements.

Industry 4.0, the IIoT (Industrial Internet of Things) and cloud computing have long been to-pics of discussion in the research world, and among a few digital pioneers, in the manufacturing sector. However, the majori-ty of managers are now aware that no manufacturing company can escape the current technological leap forward over the long term. Customers' growing demands for greater productivity, quality and flexibility combined with a competitive global environment require CEOs and production managers to introduce ongoing improvements to their processes with the help of innovative digital solutions. In the age of Industry 4.0, it is now truer than ever that if you are not going forward, you are going backward.

With the exception of the automotive industry, very few companies have whole departments dedicated to digitalizing their production processes. Where resources are limited, it is essential to prioritize planned digitalization activities carefully. This in turn calls for a coordinated picture of what the digitalized production process will look like. Only a carefully formulated road-map that includes activities and schedules will allow for the structured monitoring of digitalization initiatives.

The two key questions for the development of a digitalization roadmap are "**Where are we now?**" and "**Where do we want to go?**". It is with precisely these fundamental questions that the Dürr **Digital Readiness Assessment (DRA)** begins.

DIGITAL READINESS ASSESSMENT – DETERMINE YOUR LEVEL OF DIGITAL READINESS

The answers to the questions above shape the foundation of the beginning of the digital transformation in your company and for subsequent adjustments to it. The Digital Readiness Assessment will help you to determine this critical starting point.

The DRA was developed through a scientific partnership between Dürr Consulting and the Karlsruhe Institute of Technology (KIT). As part of the design process, existing assessments from the worlds of research and consultancy were analyzed to identify their logical structure, as well as the practical usefulness and the completeness of the data collected. This broad market analysis is the foundation of the DRA that we offer today. The extensive experience of our consultants has enabled us to continuously develop the DRA and to increase the level of detail and improve the practicability of the target criteria.

Figure 1 shows the four main categories of Organization, Technology, Production and Product & Business Model, which are divided into a total of seven sub-categories with more than 50 assessment dimensions. The Organization and Technology main categories are the enablers for the service providers, which include the Production and Product & Business Model main categories.

- **Enabler – Organization main category**

  - **Strategy and Structures**

  This category assesses the presence and level of implementation of a comprehensive digitalization strategy, a dedicated budget for digital projects and the organizational anchoring of the responsibilities. In addition, agile structures and the presence of partnerships are evaluated.

  - **Employees and Culture**

  Are your employees qualified to meet the requirements of digitalization? Is there a systematic training program? Is your workforce prepared for change? The readiness of your company with regard to these factors is recorded in the second category.

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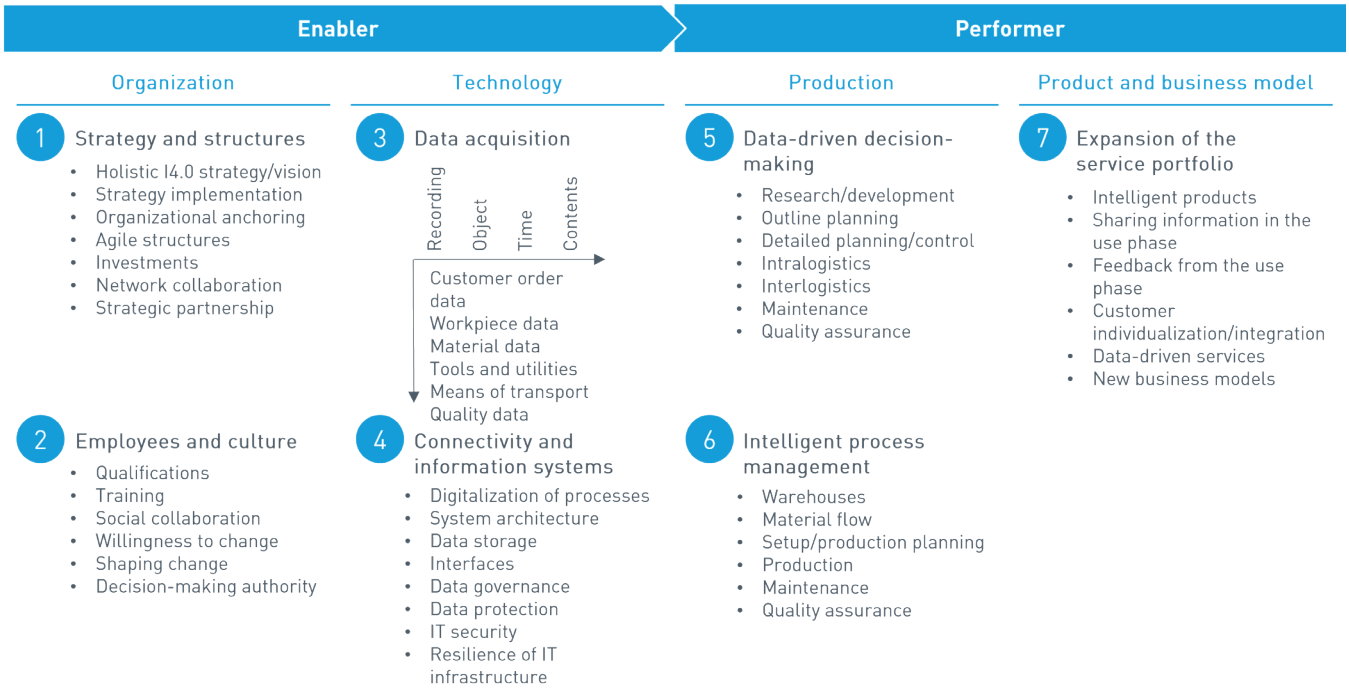

Figure 1: Structure of the Dürr Digital Readiness Assessment

- **Enabler – Technology main category**

  – **Data Acquisition**

  The third category, "Data Acquisition," summarizes all the data required on the shop floor level and consists of six data types: production order data, workpiece data, material data, tools and utilities data, transport data and quality data. The adequacy of these types of data is determined by the type of recording, object granularity, time granularity and content.

  – **Connectivity and Information Systems**

  The steps involving data transfer, storage and organization are part of the fourth category "Connectivity and Information Systems." A total of eight criteria describe the horizontal, vertical and end-to-end integration of the information flow.

- **Service providers – Production main category**

  – **Data-driven decision-making**

  The "data-driven decision-making" category describes the support provided for decision-making by data analysis and visualization. For the seven areas of outline planning, detailed planning and control, intralogistics, interlogistics, maintenance and quality assurance plus R&D, the level of data availability and of data-based decision support are recorded. It is sufficient to evaluate the lack of data availability through to full data availability using IT-based decisions with a person in the role of supervisor

  – **Intelligent Process Management**

  The sixth category "Intelligent Process Management" describes the implementation of the process. The scale ranges from individual machines with no computer-based communication through to full automation and autonomous decision-making by the systems involved in the process. The assessment criteria are based on the physical production tasks and include the following areas: warehouses, material flow, production, production planning, maintenance and quality assurance.

- ***Service providers – Product & Business Model main category***

  – **Expansion of the Service Portfolio**

  The fifth and sixth assessment dimensions address the internal processes that primarily influence the costs and overall equipment efficiency (OEE). By contrast, the seventh assessment dimension focuses on the service portfolio, which has an impact on the sales aspect of the target system. For example, the additional abilities of intelligent products, such as integrated data recording and processing, can make it possible to charge a higher sales price.

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THE WORKFLOW OF A DIGITAL READINESS ASSESSMENT PROJECT

The DRA requires few resources and provides an initial assessment of the digital readiness of the company, which can be used as the basis for identifying areas for action. As shown in **Figure 2**, the DRA consists of six steps.

- At the kick-off meeting, the goals, assumptions and the scope of the assessment in the project are coordinated. In addition, the necessary interview partners are identified. This meeting, which lasts for around two hours, can be held online or in-person.

- In the second step, preparations are made for the interviews for the analysis of the actual status and the definition of the target status. Interview dates are agreed and the questionnaire is made available to the customer's specialists.

- The actual analysis generally takes place on site and includes the interviews and a tour of the production and assembly areas. **Figure 3** shows an excerpt from the actual analysis provides supplementary information. The actual status is recorded using a Likert scale. To make the choice easier, a brief description is provided for each level. The actual status is recorded jointly by the customer's specialists and the consultants from Dürr Consulting.

- The fourth step is the definition of the target status. In this step, management plays an active role in formulating the overall goals and the vision of an Industry 4.0 factory. Then the vision is operationalized on the basis of the assessment dimensions. In other words, a specific target status is identified for each dimension.

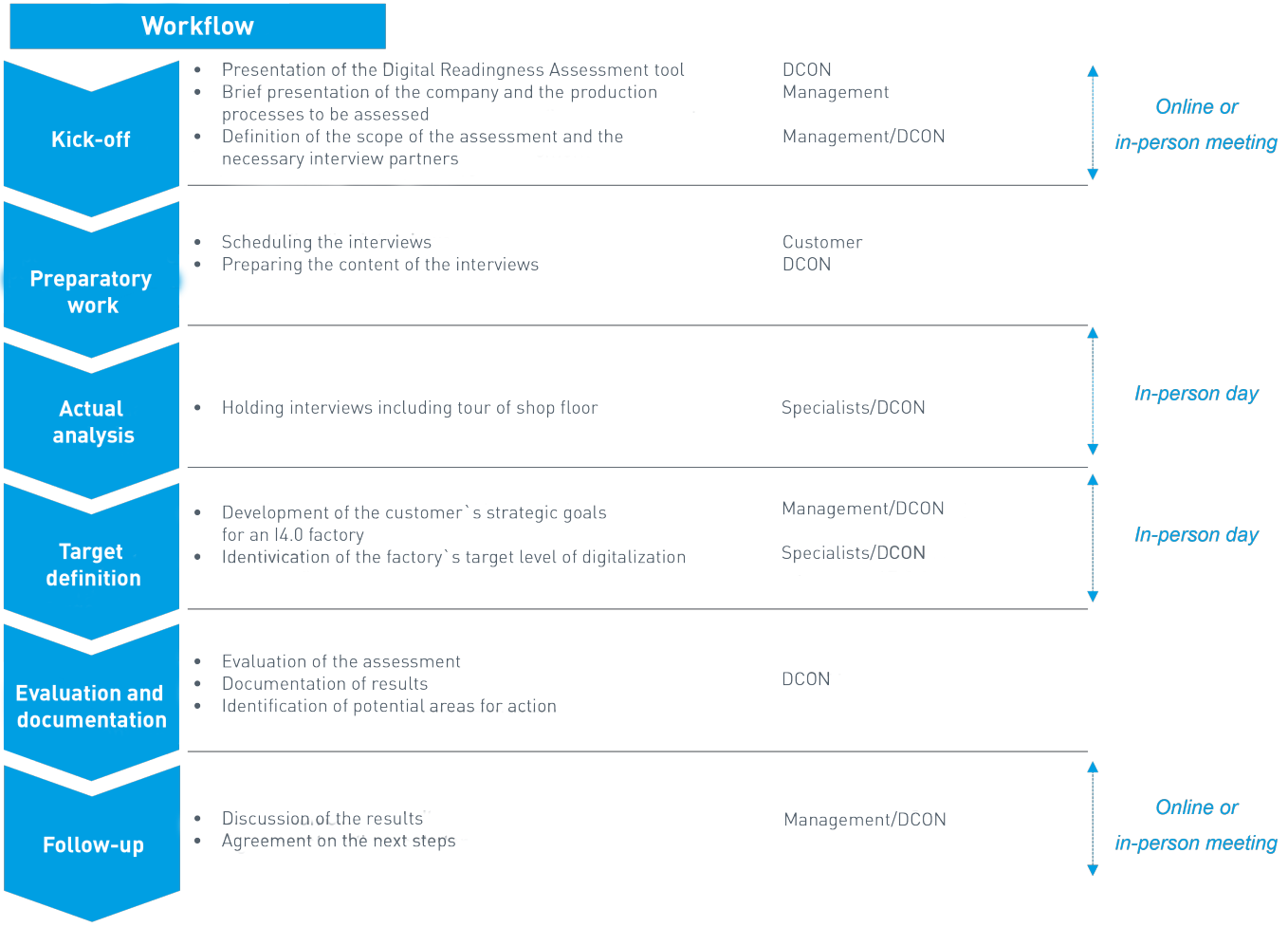

Figure 2: Methodological workflow of a Digital Readiness Assessment

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Evaluation dimension	1.1 Holistic I4.0 strategy/vision	1.2 Implementation of the strategy	1.3 Organisational assignment	1.4 Agile structures
Question	Is there a holistic strategy with specific goals and measures?	Is there a supervisory body to oversee the implementation of the I4.0 strategy?	Who is responsible for the development and implementation of I4.0? How many people are assigned to this? (Schuh)	To what extent is the organizational structure able to adapt flexibly to changing requirements?
Explanation	This dimension assesses the extent to which an overall I4.0 strategy/vision with specific objectives and a development roadmap is available.	This dimension assesses whether the implementation of the strategy is systematically and continuously monitored.	This dimension assesses the amount of resources available for development and implementation and the management level Industry 4.0 is at.	This dimension assesses the extent to which the organizational structure is able to adapt flexibly to chaning requirements.
Level 1	No ○	No ○	No dedicated responsibility ○	Rigid organizational structure ○
Level 2	Vision / mission ◉	Infrequent ○	Task force ○	Pilot projects with SCRUM and MVP ◉
Level 3	& Strategic goals ○	Systematic ◉	Decentralized organizational anchoring ◉	Use of flexible communities ○
Level 4	& Strategic fields of action ○	& Operationalized through a key figure system ○	Central anchoring at higher management level (CDO) ○	Cross-divisional use of agile methods with flexible communities ○
Level 5	& Strategy with action plan ◉			
Maturity levels				

Figure 3: Excerpt from the actual analysis of Strategy and Structures

- The step that follows, namely Evaluation and Documentation, is carried out by Dürr Consulting. **Figure 3** is an example of an assessment of the actual status for the category Strategy and Structures. The target and actual values are compared for each assessment dimension. This highlights any deviations and, at the same time, acts as an indication of potential areas for action. In addition to the quantitative representation of the results, supplementary qualitative comments are documented that have been recorded as part of the actual and target analysis.
- The final step consists of a follow-up with the customer's management team. Based on the quantitative and qualitative results of the assessment, Dürr Consulting identifies areas for action and outlines optimization measures. These are presented to the customer together with the documentation of the assessment and handed over during the meeting. **Figure 4** is a sample summary of the actual status, a graphical comparison of the actual and target values and the areas for action identified on the basis of the gap between them.

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***Current status** (ACTUAL state)*

The current **digitalization strategy** of NewCorp AG **consists of a vision/mission**, but no areas for action or measures have yet been defined.

The **activities will be systematically prioritized** to increase the efficiency of the service portfolio and introduce improvements to it.

There are currently **no strategic partnerships.** In the past, NewCorp AG has carried out all the development work in-house. The potential of external partnerships is unknown.

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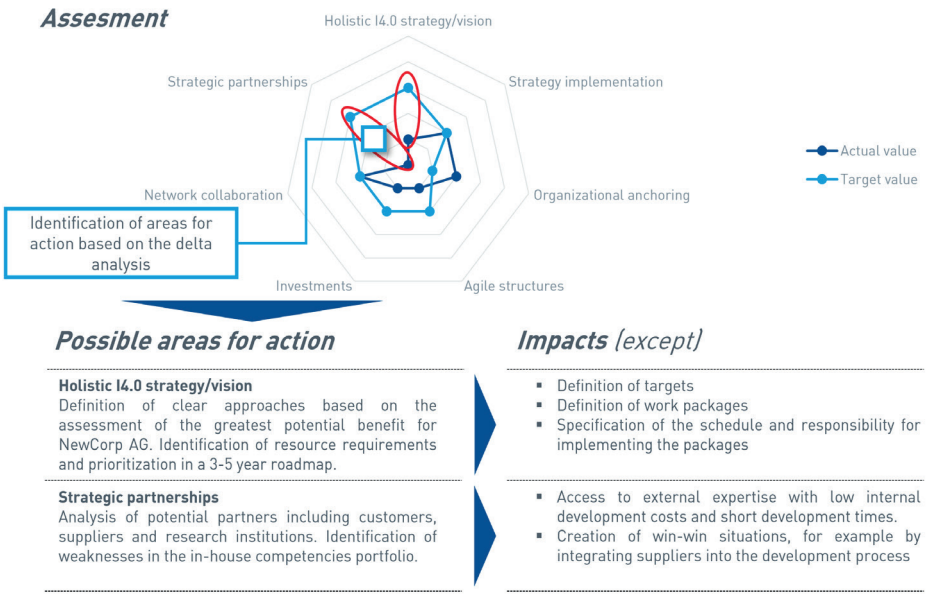

Figure 4: Identification of areas for action

AN IMPORTANT POINT TO REMEMBER: WHERE IS OUR COMPANY IN RELATION TO OTHER COMPANIES?

One special feature of the Digital Readiness Assessment is the ranking of your company through an industry benchmarking process. This relative assessment is based on a qualitative comparison with the mean, median and top-performer values and on the experience of the consultants from Dürr Consulting from previous and current projects. Data protection is a key consideration and the anonymity of the companies taking part is always guaranteed. We adhere closely to the principles of the Benchmarking Code of Conduct of the EFQM (European Foundation for Quality Management).

FROM ANALYSIS TO IMPLEMENTATION

It is extremely challenging for small and medium-sized companies to manage optimization projects alongside their day-to-day work. However, structured tracking of a variety of measures is of great importance for the consistent implementation of the initiatives.

CONCLUSION

The digitalization of production is a reality that no business can escape in the long term. Because of the complexity of the sub-ject and the often limited resources that small and medium-sized companies have for strategic issues, there is a risk that they will observe the digital transformation rather than actively shape its progress. The Digital Readiness Assessment enables them to take the first important steps towards playing an active role in designing their digital transformation while keeping the use of human and financial resources to a minimum. The experts at Dürr Consulting have many years' experience in the production environment and this ensures that you will receive relevant, practical recommendations for action based on actual and target analyses and a ranking through an industry benchmar-king process as the results of the Digital Readiness Assessment.

Have we sparked your interest? Then please contact Dr. Paul Buess to book your Digital Readiness Assessment.

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