MHP
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MHPWHITE PAPER

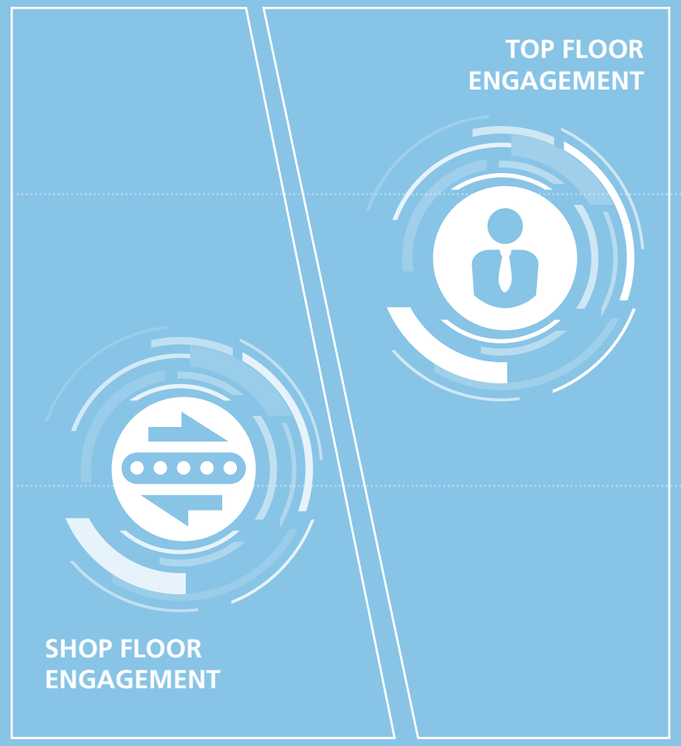
TRANSFORMING TOP FLOOR, ACCELERATING SHOP FLOOR

How to overcome obstacles in the transformation to a Smart Factory

CONTENT

The digitalization of production processes has been steadily gaining pace in recent years – nevertheless many companies have only introduced stand-alone solutions on the shop floor and little consideration has been given to designing and implementing scaled-up solutions that span multiple production areas and plants. To create a successful Smart Factory, however, it is essential to implement holistic end-to-end solutions – both throughout the company and along the supply chain. This holistic approach to transforming to a Smart Factory can only be implemented with the support of top management. One key requirement is a change in the top-floor mindset, which is then cascaded right down to the shop floor, filtering through to the entire company and its ecosystem on route. This white paper describes the five Cs, which represent the main fields of action for a successful Smart Factory transformation.

The focus in the Smart Factory is shifting from the shop floor to the top floor



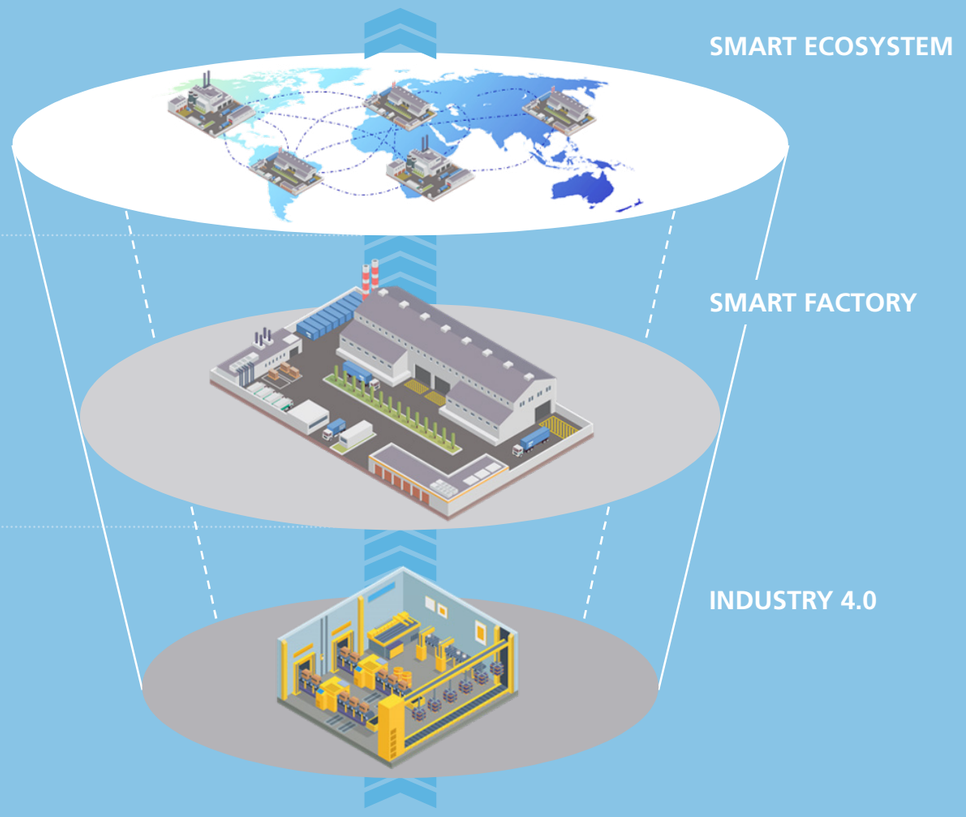


Figure 1: Paradigm shift in digital transformation

Introduction

From Shop Floor to Top Floor

In the past, the primary focus was on optimizing individual machines and production plants. In this context, the term Industry 4.0 was ever-present. Innovative solutions were tested and introduced – but they generally only functioned within the ecosystem in which they were developed. There was rarely any kind of push to scale up the solutions and include other departments or plants. As such, the Industry 4.0 approach is predominantly shaped by the shop floor engagement.

The focus is now increasingly shifting to cross-departmental optimization. With the vision of a Smart Factory companies strive for interconnected and digitized plants to exploit optimization and savings potentials along the entire value chain. Therefore, it is necessary to think in terms of networks and ecosystems when implementing a Smart Factory approach. This requirement applies both to the implementation of new solutions and technologies as well as the strategic and cultural mindset of the management. These developments result in a paradigm shift that gradually moves the topic from the shop floor up to the top floor. Top management gradually becomes the driving force behind the digital transformation – from strategy to culture and employees and right through to the company's production processes.

MHP Industry 4.0 Barometer

MHP has been executing the Industry 4.0 Barometer in collaboration with LMU Munich since 2018, setting the industry benchmark for Industry 4.0 activities in German-speaking countries. Each year, more than 200 representatives from all branches of industry and all hierarchical levels participate in the survey.

The 2020 results have highlighted six key challenges in the transformation to a Smart Factory:

- A lack of cross-departmental collaboration slows down the process of a Smart Factory transformation
- Smart Factory solutions are primarily implemented in order to reduce costs and increase efficiency – there is rarely any focus on new business models or markets
- The demands of day-to-day business operations slow down the rollout of Smart Factory solutions
- IT infrastructures are not yet advanced enough to support a Smart Factory
- Legacy systems and data silos prevent the rollout of Smart Factory solutions
- Companies without a CIO in the executive management team show a lower Smart Factory maturity level

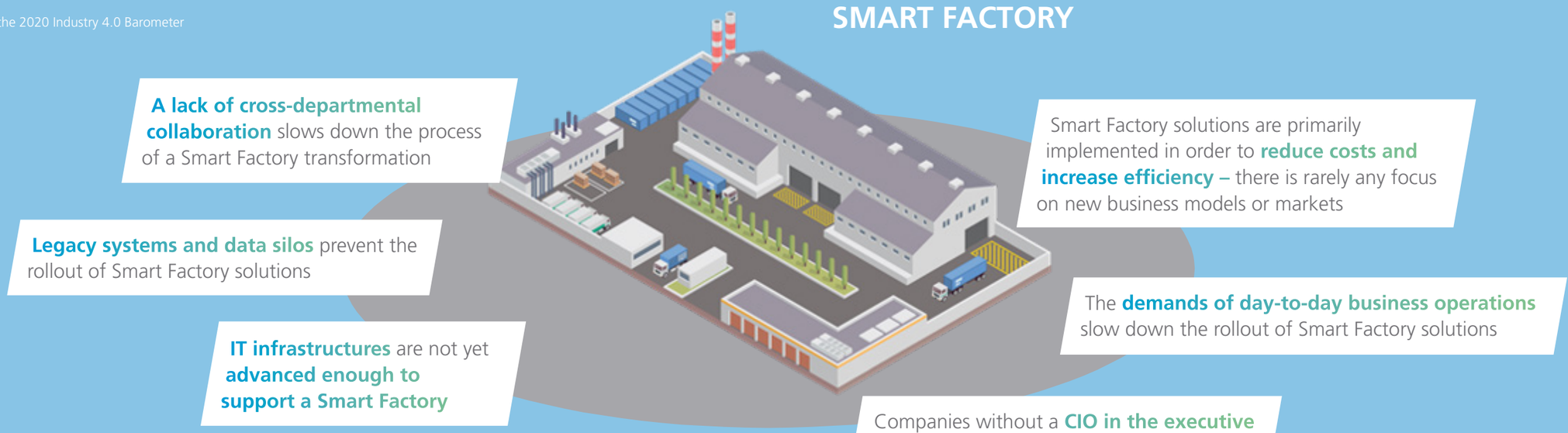
The results of the Industry 4.0 Barometer as well as the experience gained from a broad range of smart-factory projects reveal that digital transformation is still often stuck at shop floor level. Therefore, a strategic realignment of the top floor is necessary in order to bring the digital transformation into the company via the shop floor.

Five fields of action – the five Cs – can be used as the basis for successful transformation of the top floor:

- **Cooperation**
- **Change**
- **Culture**
- **Capabilities**
- **Coopetition**

The Smart Factory level in the industry presents many challenges on the shop floor.

Figure 2: Key findings of the 2020 Industry 4.0 Barometer



The five Cs of a successful transformation to a Smart Factory

Figure 3: The five Cs of a smart-factory transformation

Cooperation

Hypothesis: Each department is optimized at a local level without achieving the global optimum

In order to remain competitive in volatile markets with dynamic customer requirements, it is essential that companies continuously improve. Each company is a complex construct characterized by strong interdependencies between its individual departments, yet digitalization initiatives often only optimize individual processes or areas – working within the confines of local barriers and conditions. In addition, the optimization projects are often carried out opportunistically and sometimes even reactively instead of following an overarching strategy. This results in improvements that are singular rather than holistic.

If the individual departments of a company permanently optimize themselves and the potential for cross-departmental perspective is disregarded, the isolation between the departments is exacerbated, creating what is known as a prisoner's dilemma. The result is redundancies and efficiency losses rather than the exploitation of synergy potential.

A leading international premium automotive manufacturer was about to implement RFID as a tracking technology for load carriers within its plants. At the start of the project, a use case was developed within a pilot plant, but the associated business case yielded a negative result. The business case was reevaluated by a cross-plant project center, which identified cross-plant economies of scale. After the reevaluation, the use case was implemented across the entire company – with what was now an extremely positive business case.

This example illustrates that a successful transformation to a smart-factory configuration requires holistic approaches and the involvement of all relevant stakeholders – both in the company's internal value chain and in the external supply chain.

However, this can only be achieved by a cross-divisional realignment of management targets and KPIs. Existing KPIs need to be restructured and aligned to enable cross-departmental performance evaluation – for example by mapping cost savings across the entire value chain or across multiple plants. Furthermore, management must also be incentivized to cross-departmental KPIs.

Each department is optimized at a local level without achieving the global optimum

- Promote inclusive collaboration
- Create incentives across all departments
- Hold management accountable

Change

Hypothesis: Processes on the shop floor are easier to change than the mindset of employees

Individual processes on the shop floor can be optimized quickly and easily. A successful Smart Factory transformation, on the other hand, requires connected and cross-departmental solutions that cannot be implemented in a traditional line organization. Existing silos need to be broken down and organizational structures rebuilt in order to enable and establish the necessary end-to-end approach.

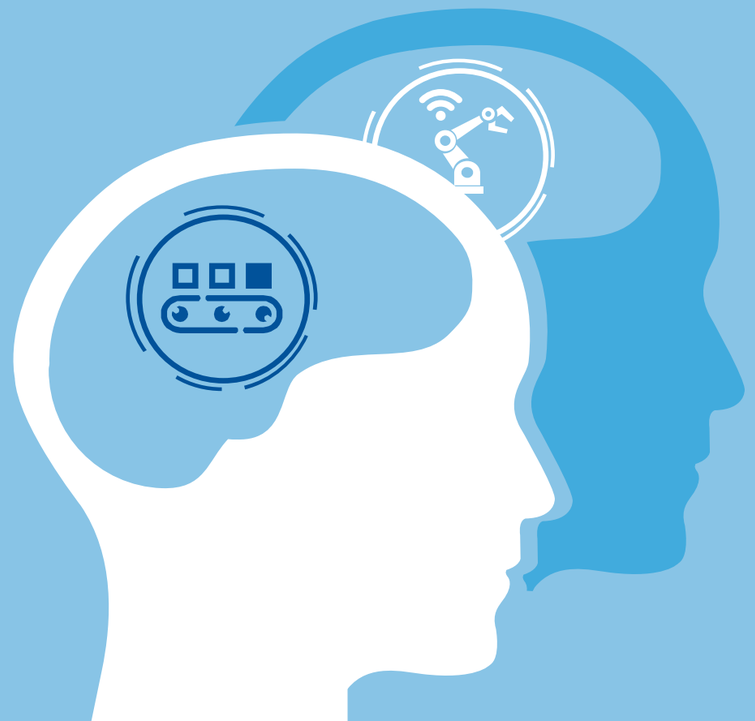
However, organizational changes alone are not enough. In addition to structural changes, there also needs to be a change in mindset among employees at all levels of the company. On the top floor in particular, it is important to rethink and revise how risks are handled. Young companies such as Tesla understand how to convert the risks of digitalization into opportunities, and this allows them to become serious competitors to established companies.

The risks involved in traditional series production have been thoroughly investigated and can be managed easily now. Tried-and-tested lean management initiatives have been implemented in this area for decades and they produce rapid results. However, the risks involved in digital production, such as external cyber-attacks or production downtimes due to system failures, require new and innovative tools, and beyond that the willingness to use these tools. The potential of digital and networked production can therefore only be fully exploited if employees at all levels recognize and understand the added value for the entire organization rather than viewing the situation as a threat to their jobs.

In the warehouse of a leading German automotive manufacturer, employees blocked driverless transport systems with crates and pallets because they regarded the driverless transport system not as a support but as a threat to their own jobs. The transport system has since been equipped with a voice function that enables it to communicate with the employees, report obstacles and warn of potential dangers.

Processes on the shop floor are easier to change than the mindset of employees

- Drive organizational change
- Practise end-to-end management
- View the risks involved in digitalization as opportunities



Culture

Hypothesis: To achieve a successful transformation, companies need a new shareholder culture

Established industrial companies – particularly companies listed on the stock market – and their management are driven by quarterly and annual reports. Their focus is on increasing shareholder value (as quickly as possible). However, a Smart Factory transformation is a marathon – not a sprint. Complex potentials and synergies cannot be fully exploited within a single reporting cycle.

Shareholders of companies such as Google and Tesla already have a fundamental understanding of this long-term viewpoint. In order to succeed with a Smart Factory transformation, established companies need to change their existing shareholder culture. However, this can only be achieved if the company repositions itself internally, by making a change to the corporate culture.

That is why it is important to establish a sustainable culture of innovation within the company. Employees should feel intrinsically motivated to embrace new technologies and solutions and be willing to actively discuss innovative ideas with colleagues, and they should have the confidence to try out new technologies and solutions. The same principles apply to management. Instead of pursuing individual lighthouse projects with comparatively little potential, the focus should be on long-term optimization and innovation projects that enhance the entire end-to-end value chain.

Before introducing bold and profitable Smart Factory solutions, it is necessary to adapt basic processes and technologies, for instance in data management. From a local, short-term perspective, such adjustments may seem unattractive both financially and in terms of marketing, but in the long term they are essential in order to embrace the full potential for optimization.

To achieve a successful transformation, companies need a new shareholder culture

- Establish a sustainable culture of innovation
- Prioritize long-term success
- Pursue value-based use cases

Capabilities

Hypothesis: Management needs to better understand the added-value potential of data

Data has become an important currency, but this reality has only been partially accepted within companies and in the mindsets of managers. When transforming to a Smart Factory, the ability of management to recognize the value of data and to exploit its value for production and organization – in addition to numerous other capabilities – is of central importance.

Data offers infinite potential; it can even exceed the potential of individual production assets. Data-driven closed-loop production opens up a huge amount of potential for optimization and savings. Connecting the entire product lifecycle – from development through to use by the customer – means that data can be used systematically to optimize processes and workflows. Knowledge gained about processing errors encountered in production, by means of high data availability and data quality and the efficient interconnection of the value chain, can be used to adjust the product development process directly. For instance, future process errors can be prevented.

Company-internal cost rates exist for production machinery. This is far from being the case with data, despite the fact that collecting, storing, backing up and managing data all generate costs. The monetization of data is something that has not yet been fully explored, but it offers a huge amount of potential.

Data marketplaces are an attractive solution. These platforms have clearly defined entry barriers, authorizations and remuneration models and offer departments and external companies alike the opportunity to share data with each other and to use that data to develop innovative services.

A premium automotive manufacturer wanted to develop a use case for predictive maintenance using the production data from its production systems. The system manufacturer, however, denied access to the control protocols and threatened to invalidate the automotive manufacturer's warranty. Instead of jointly developing and scaling an innovative solution, the entire supplier contract was almost terminated.

Management needs to understand the added-value potential of data

- Establish data circuits for optimization
- Establish collaborative data marketplaces
- Promote data monetization

Coopetition

Hypothesis: A Smart Factory cannot operate successfully without partners – the venture can only be a success if everyone works together

The digital transformation of companies requires new capabilities. In particular in volatile markets with dynamic customer requirements and fast-paced innovation cycles, it is essential to develop new capabilities in order to achieve a sustainable competitive advantage. Yet individual companies have neither the time, resources nor budget to build and develop this breadth of skills and competencies themselves.

For this reason, existing skill sets must be supplemented by external expertise and solutions. In concrete terms, this means that companies must open up to partnerships and cooperate with other companies – both within and in particular outside of their own sectors – to enable each company to profit from its core competencies and explore previously untapped potential.

Leading companies from the automotive industry are already doing this. Volkswagen is combining its production and process expertise with the technology expertise of AWS. BMW and Microsoft are also joining forces to build an industrial cloud.

Within these partnerships, it is important to work together on equal terms. The transformation to a Smart Factory can only be successful if all participants play their part in equal measure in the quest to achieve a common goal. It is essential that companies promote a mutual exchange of expertise that enables them to make the right decisions together.

The "Flex Factory" is a joint venture established by Porsche AG in collaboration with MHP and Munich Re to support companies on their way to a Smart Factory. Porsche has many years of experience in production, while MHP complements this with innovative solutions for process digitalization and Munich RE rounds off the range of services with financing and insurance models. The result is an excellent, mutually beneficial partnership.

A Smart Factory cannot operate successfully without partners – the venture can only be a success if everyone works together

- Establish digital ecosystems
- Combine core competencies profitably
- Work together on equal terms

A successful Smart Factory transformation can only be achieved by simultaneously transforming the mindset on the top floor.

Markus Wambach
MHP

Outlook

How to accelerate the shop floor if the top floor does not transform?

Ultimately, a successful Smart Factory transformation can only be achieved by simultaneously transforming the mindset on the top floor. There must be a clear strategy for the Smart Factory that pursues common goals. This strategy must start with senior management and the shareholders as well as cascade down across all departmental and company boundaries. This includes, in particular, creating a corporate culture that strengthens a company's own skill sets and promotes innovation. This is the only way to achieve sustained success and to channel the transformation down from the top floor to the shop floor.

This is the exact basis of MHP's holistic consulting approach – from strategy to operationalization, from analysis to implementation, from development to sales, from top floor to shop floor. Our consulting portfolio focuses on business, technology and organization, enabling us to offer a complete end-to-end service.

In particular in volatile times, it is important to take a holistic view, as organizations and companies are constantly confronted with complex and dynamic challenges. Our holistic consulting approach helps organizations to systematically identify social, economic, legal as well as environmental changes at an early stage and to respond quickly and flexibly to the new environmental conditions.

We are also continuously expanding our scope of action and are now actively involved in numerous other sectors in addition to the automotive industry as one of the leading consultants in cross-organizational digitalization, modernization and optimization projects. We are aware of our influential position, which results from the economic, technological and social standing of our customers and business partners, and we take our responsibility seriously.

The satisfaction of our customers and business partners is always our top priority when implementing projects, reflecting our philosophy – DRIVEN BY EXCELLENCE. At MHP we strive for excellence in all our activities, acting as a trusted advisor to our customers and providing expert, reliable advice in all relevant fields and business areas.

At the same time, we actively support our customers with the process of digital transformation and always place great emphasis on the sustainability of the strategies and solutions developed. As such, we rely on a diverse range of consultants and have experts in all relevant fields whose skill sets and experience guarantee the success of customer projects. This allows us to work with our business and cooperation partners to achieve our goal – **ENABLING YOU TO SHAPE A BETTER TOMORROW.**

Publisher

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Welcome to the Future. MHP is a leading international management and IT consultancy. We develop pioneering mobility and manufacturing solutions for multinational corporations, mid-sized companies and disruptive startups. As a premium business and technology partner, we are shaping tomorrow's digital future, today.

Our consulting approach is unique, combining holistic IT and tech knowledge with deep expertise in management. This makes MHP the ideal partner for a successful digital transformation. As digitalization experts, we deliver innovative strategies on the basis of strong analysis. These turn your change processes into sustained success.

Over 3,000 employees are driving digital progress in 20 locations worldwide, for over 300 clients. We display excellence at every level. **MHP: DRIVEN BY EXCELLENCE**

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