Organizational Structure

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The British commanders were highly skilled professionals who affected the amateur style of country gentlemen. They banded with one another as old boys but were exquisitely sensitive to rank and privilege. Cornwallis arrogated the major decisions entirely to himself and rejected contrary advice from his officers. The Americans improvised a different system of command. It was forced upon them by the diversity of cultures in the country, by the pluralism of elites, by a more open polity, by a less stratified society, and especially by expanding ideas of liberty and freedom. The man at the center was George Washington. From much hard-won experience in American politics and war, he had learned to work closely with his subordinates. . . . Later he worked more skillfully by the construction of consensus. In that way he created a community of open discourse and a spirit of mutual forbearance.
D. H. Fischer (2004, p. 315) writing about the differences in the organization of the Continental and the British army in the American war of independence

Key Takeaways

- Discussing the organizational structure of the service business at manufacturing companies mostly concerns its integration or separation.
- The majority of manufacturers favor separation for traditional, physical services.

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- Providing smart services, however, implies the collaboration of formerly highly independent functions, leading to a need for restructuring the current organizational design.
- Since companies are unique and general design guidelines nearly impossible to provide, we developed a typology of eight different configuration possibilities.
- Manufacturers can systematically use the typology, presented below, to find a feasible option depending on its particular contingencies.

Discussing the organizational structure of a company naturally follows the debate about its strategy. The quote above demonstrates the need for a fit of an organization not only with strategy but also with culture and the impact an organization can have on actions and outcomes. As we indicated in Fig. 2 in Chap. "Service Strategy", the formulated service strategy acts upon the organizational design and often leads to its rearrangement. Both practitioners and scholars agree that it is important to arrange the organization in a way that supports the effective execution of the defined strategy. More specifically, an organizational configuration suiting the current situation of a company fosters success (Hax & Majluf, 1983).

As manufacturing companies need to show ambidextrous abilities in managing both the product and service business, they see themselves confronted with various barriers and challenges, which we discuss in the next paragraphs. Afterward, we provide insights into different structuring possibilities for the service organization and distinguish between configuring the physical and smart service business. We end with recommendations for practitioners and a summary concerning the organizational structure.

1 Barriers and Challenges

A manufacturing company that undertakes the first steps toward providing industrial services to its customers is not likely to adapt the organizational design right away. Maybe the company adds people to the organization every now and then or just qualifies existing personnel to deliver the first services.

Yet, as the company changes the way it does business, it must adapt its organizational structure sooner or later. One of the main reasons why manufacturing companies struggle to meet the expected financial returns when ramping up the service business was found to be an inappropriate organizational design (Gebauer, Fleisch, & Friedli, 2005). It is, therefore, a crucial activity to re-tighten the organizational structure to increase efficiency and effectiveness.

For manufacturing companies, the main challenge lies in uniting the divergent behavior of product- and service-oriented organizations. As pictured in Fig. 1, product-oriented companies are typically engineering-dominated, wherefore most activities take place, and the major share of the personnel is located backstage. Promoting and selling the product, besides nurturing the customer relationship, are less pronounced compared to research and development endeavors of the hardware.

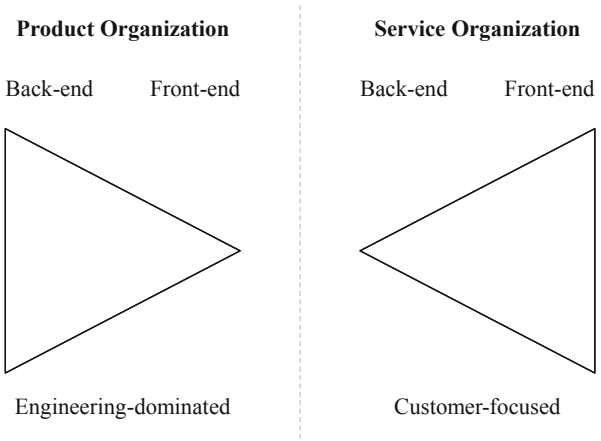

Fig. 1 Simplified illustration of employee distribution at typical product and service companies. Own illustration

For traditional service companies, it is exactly the opposite. Backstage tasks fall far behind, while the focus lies on customer-centered value creation.

To illustrate the main difference between a product- and a service-oriented organization, namely, the shift of the companies' focus, consider the following two examples.

Sefar is one of the world-leading manufacturers of filters for various industrial applications. The company attained such a high reputation due to the superior quality that most car OEMs explicitly include Sefar filters in their specifications for suppliers. Consequently, Sefar concentrates most of its resources on developing and producing the filtration solutions (i.e., on the backstage activities).

Contrarily, any consulting company (imagine the Boston Consulting Group, for instance) will not be successful when they try to sell pure method descriptions. They only create value for their customers when they cater to the customers' problems on-site. Hence, customer-facing activities are much more important than they are for pure product manufacturers.

Strategically offering services means uniting the divergent behavior of product- and service-oriented organizations. Simply combining the two triangles (see Fig. 2) is, however, not the right approach. Establishing a massive service organization next to the existing product business is unlikely to be a reasonable tactic and potentially undermines financial targets. Both aspects need to be intertwined in a way that the organizational design results in a mighty but lean constellation.

Manufacturing companies need to find a feasible version based on their contingencies, in strong alignment with the underlying service strategy, and concerning potential influences from make-or-buy decisions. Moreover, opting for a new organizational configuration leads to further implications, predominantly affecting current, as well as new, processes and roles.

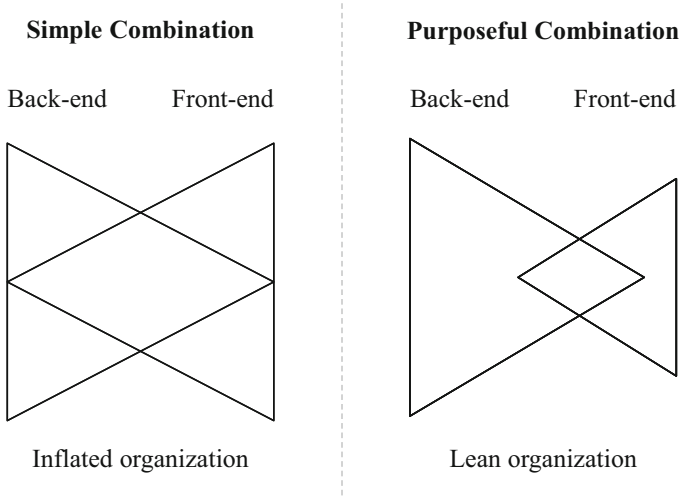

Fig. 2 Simplified illustration of a combined product and service organization. Own illustration

2 Structuring for Success

Introducing industrial services means, in most cases, that a manufacturing company first starts to offer physical services before advancing toward smart services. Correspondingly, the organizational structure may evolve in parallel to the servitization journey of the company. While dominant perspectives on the organizational design of the physical service business exist, companies may conceive different alternatives when providing smart services. Hence, we first present structuring possibilities in the first stage of the servitization journey before discussing recent insights in the era of smart services.

2.1 Organizing the Physical Services Business

About 15 years ago, discussing the organizational integration of the service business in the process of servitization gained more and more interest among scholars. Manufacturing companies reflected the need for clarification as they struggled to get the service business on track. At that time, two dominant perspectives on the organizational structure emerged, which are still present today.

We demonstrated that the service organization commonly works differently than the product organization, wherefore most experts tended to suggest manufacturing companies the separation of the service business (cf. Oliva & Kallenberg, 2003). Gebauer et al. (2005) endorse this position since they discovered a separate service organization would increase its performance and counteract the service paradox.

Separation does not imply the externalization of the service business in this case. Instead, it describes the organizational differentiation between the product- and engineering-dominated part of the company with the service- and customer-dominated part. A dedicated service business unit eases the development of a service mindset and comes along with higher measurability and accountability in terms of profit and loss responsibility (Turunen & Toivonen, 2011).

However, to provide compelling value propositions consisting of products and services, the second view focuses on the integration of the service business (Neu & Brown, 2005, 2008). The rationale behind the integration perspective is that companies typically offer new services to existing customers; thus, the companies' products and services jointly contribute to the customer experience. Consequently, manufacturing companies should bring product and service teams closely together to better serve customer needs and provide real solutions (Biege, Lay, & Buschak, 2012).

The functional integration of the service business may be reached by establishing product and market-facing teams within each division. Transparency about the effect of the service business can, therefore, be an issue. When the company is not able to measure this effect, which occurs frequently, companies need to find other steering mechanisms or key performance indicators.

Both constellations describe two extremes located on the poles of the integration-to-separation continuum, each comprising certain advantages and drawbacks. Notably, the differentiation between those two alternatives increasingly blurred over the last decade. While most manufacturers followed the suggestion of a separate service organization, scholars question when separation is really necessary (Fliess & Lexutt, 2017). Most recently, several authors concluded that separation might not always be the best solution as it does not guarantee success (Raddats, Kowalkowski, Benedettini, Burton, & Gebauer, 2019; Turunen & Toivonen, 2011). Nevertheless, they feel that separating the service business eases its ramp-up, and companies will find a way to structure the organization with progressing maturity.

From a practical point of view, we experienced that most manufacturing companies established a separate service organization. Even though separation complicates the company-wide diffusion of a service mindset, it enables better controllability through its own profit and loss responsibility.

When a company offers traditional, physical services, it seems to be a reasonable choice to separate the service business. Service operations commonly succeed the product sales, so it is for service and product development. As service- and product-related activities are decoupled to a large extent, organizational separation can be a logical choice. However, the possible conflicts between the product and the service business should also, in this case, not be underestimated, especially if it comes to profit. Without a service strategy that is derived from the overall corporate strategy (see Chap. "Service Strategy"), these conflicts could easily escalate.

2.2 Organizing the Smart Services Business

Moving toward smart services even creates more challenges than providing physical services. Distinguishing between product- and service-related activities is less clear, as smart services are closer to products, build on data from the companies' products or third sources, and contain a software component on top of that.

When manufacturing companies decide to provide smart services, it entails a more invasive reaction on the organizational configuration than introducing physical services. But why is this, in general, the case? Consider the following example.

When the machine tool manufacturer, on which we elaborated before, decided to provide physical services, the CEO made clear that the services should support product sales by increasing product availability, in turn, raising product attractiveness. The CEO figured out that the company can leverage service efficiency and effectiveness by consolidating the required competencies aside from the regular product business. Consequently, the service department is responsible for developing new installation procedures, repair, and maintenance schemes, as well as training plans, once their colleagues developed a new product generation. As the interaction between these two divisions is limited to very few touchpoints mostly concerning product specifications, the CEO does not feel the need to rethink the current organizational setup.

Later, after the company introduced the remote monitoring and dashboard service to the customers, service managers anticipate the potential and need for providing a predictive maintenance service. So far, the CEO partnered with an external software company to develop the remote monitoring service, but now understands that it could be beneficial for the future to leverage the knowledge for smart service development in-house. The predictive maintenance service consists of a software program that uses machine tool data to flag potential failures after reaching or surpassing a predefined threshold. Consequently, the service department has to define the business concept behind the new offer, IT or a dedicated software unit needs to build the program, and the product organization must ensure that the right data, with the right velocity, is transmitted accordingly.

Developing this service leads to the collaboration of at least three different departments with far more touchpoints than they used to have. It demonstrates that the CEO has to react to the new circumstances by restructuring the company.

Based on the complexity involved, companies reveal a growing interest in receiving guidelines on how to adapt the organization due to the emergence of new digital technologies and smart services.

We asked manufacturing companies during a benchmarking study how they think the optimal organizational configuration looks like and let them select one answer among five different options (staff function, decentralized, project/lead team, separated functional unit, and integrated functional unit). Forty-two percent think that separation is the optimal choice, while 32% opt for an integrated structure. With the residual 26% selecting one of the other options, it becomes obvious that not a single optimal configuration exists. It may be true that some companies are just wrong in what they think is the best structure, but a plethora of extant literature

suggests similarly that organizations are unique scaffoldings adapted to the individual contingencies of each company. Giving specific guidelines on how to adjust each organizational structure is, thus, tempting, but nearly impossible without getting too abstract.

Nevertheless, recent research in close collaboration with industry allowed us to derive a typology of eight different organizational configurations with a focus on the integration of the smart service business at manufacturing companies. These eight types are quasi-fictional representations of real-world organizations, meaning that each type accentuates particular traits to increase differentiation but is unlikely to exist in practice in its displayed form. However, manufacturing companies can examine the developed typology to find a role model for their future structure, or just to get inspiration for how to re-arrange the current design. Deciding for a specific type entails its customization to the manufacturers' context, wherefore it is essential to follow a selection process with care and transparency.

But first, we characterize the eight structuring possibilities illustrated in Fig. 3.

2.2.1 Hub & Spoke

The first type accentuates the collaboration between a central digital unit and the smart service teams within each division. The digital unit may be an independent department with a focus on digital technologies, technology-centered research, and all competencies pertaining to gathering, handling, or processing data. It could be consolidated with the corporate IT, or established next to it. On the other side, the market-oriented divisions have sovereignty and responsibility for the service business, while the digital unit supports the technological aspect of service development.

Particularly manufacturing companies that tend to be active in diverse product markets, where the specificities of each product are complicated to scale throughout the entire portfolio, might opt for industrial service teams close to the product business. In combination with a central digital unit, uniformity in terms of platforms, tools, and IT infrastructure can be ensured to prevent undesired redundancies.

2.2.2 Front-End Convergence

The main focus of the second type lies in the dominant sales department. Here, the functional arrangement of the company culminates in the mighty sales unit. The idea behind this type is that no matter which product, physical, or smart service each department develops, the ultimate goal is to satisfy the needs of the customer. Therefore, the sales force needs to have all the munition the company may offer when discussing the current situation with customers. Perhaps the best solution is to offer a leasing contract for expensive machinery or a combination of physical and smart services to prolong the usable life of existing equipment. In any case, customer-centricity is the magic word for companies that represent this structure.

Concerning the smart service business, it can be part of the industrial service unit or erected as an independent department next to the product and physical service business. Depending on the compatibility among the industrial service portfolio, it could be reasonable to unite or separate the different service businesses.

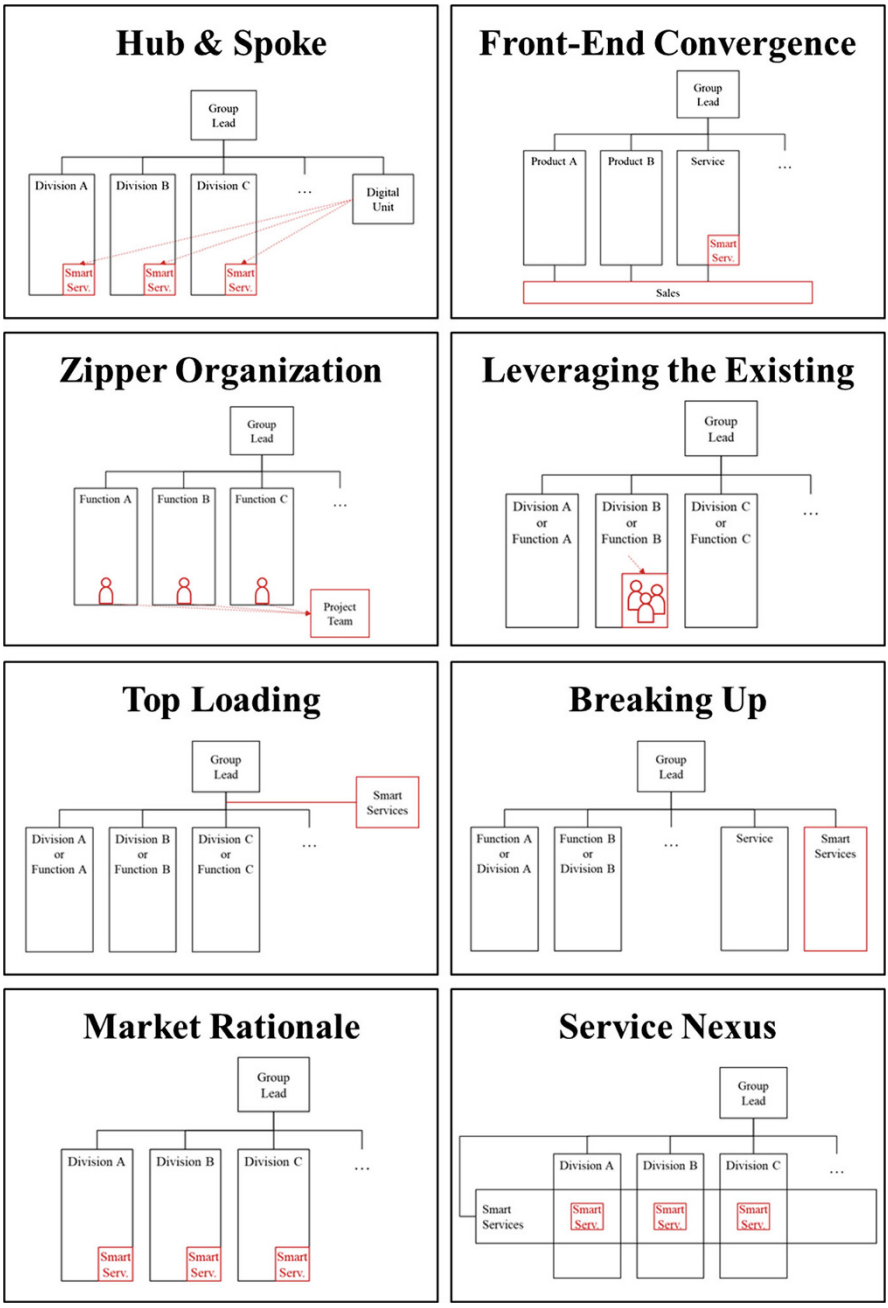

Fig. 3 Graphical representation of the derived types of organizational designs. Own illustration

2.2.3 Zipper Organization

When manufacturing companies begin serving existing customers with new smart services, they frequently opt for a project organization. Here, we describe a version of a project organization where the team consists of knowledgeable employees from different functions (including product development, IT/software, and service). These can be representatives for their functions cooperating to build a new smart service, while most of the actual work is executed within each unit. Or, the project team involves temporarily delegated employees comprising all necessary competencies for smart service development.

In both cases, the long-term sustainability of this configuration is questionable. The advantages lie instead in fast and agile working conditions paired with its easy and resource-poor implementation, when the responsibilities are clearly defined and communicated.

In practice, we often realized that manufacturing companies try to settle the uncertainty about the potential and consequences of introducing smart services within project teams. The manufacturer then decides to transition to a more stable organizational structure once it specified the strategic direction and objectives of the service business.

2.2.4 Leveraging the Existing

Leveraging the Existing mirrors a highly integrated organizational structure in contrast to *Breaking Up* (see below). Companies that choose to integrate the smart service business typically assign the additional tasks to units, teams, or individuals who have a strong background in related fields, such as software or service. Often, they do so because the new smart services align with the existing business to a great extent, or the company feels that it has the right competencies in place. Sometimes it can even have been organically grown within one distinct unit, when they started to advance into the field of smart services on their own initiative.

Manufacturers can use this organizational structure to build coherent and sound value propositions involving products, physical, and smart services. The closeness to each other helps shape complementing and supporting strategies. However, measuring the effectiveness of the newly introduced smart service on performance enhancements is difficult. Steering indicators could focus on values such as recurring revenue, the number of service contracts sold, or the project backlog in terms of secured service months. But only when the business and pricing model of the smart service allows to measure these values, it could provide an option to indicate the success of selling the service, as well as its contribution to the overall revenue.

2.2.5 Top Loading

Centralized decision-making typically characterizes manufacturing companies that select a *Top Loading* configuration. Here, the smart service unit mirrors a staff position with a short distance to the top management. The business side of service development takes place at this prominent position to enable fast and flexible decision-making besides highlighting the importance of the new business to the employees.

However, other divisions or functions are responsible for the technological development of the smart services, which may lead to bottlenecks, as the regular product development departments access the same resources.

Long-term sustainability could be an issue for this type. Yet, it reflects a good starting configuration due to a relatively cost-efficient establishment of the smart service business.

2.2.6 Breaking Up

The fourth type is the closest representation of a separate service organization. Figure 3 illustrates the separation of the smart service business on the divisional level, while it could also be done at the unit or team level. It surely allows good measurability and accountability in terms of financial figures (e.g., profit and loss) but requires intensive resources for its setup. Often the acquisition of new talents is part of erecting a separate service organization, and long-term sustainability should not be an issue.

However, a manufacturing company needs to balance the advantages and drawbacks of going for a separate smart or industrial service business in general. Following this approach leads to the investment of vast financial and human resources with limited reorganization flexibility in the future. Once the company ramped-up such an organization, it may contribute to the overall performance significantly, but fast-changing market or environmental conditions may be absorbed less easily.

In practice, we experienced that separating the smart service business at least for some time is repeatedly the only choice for a manufacturing company since the new business is substantially different from the existing product and service portfolio. It naturally entails the need for novel processes, approaches, and personnel in a detached organizational form.

2.2.7 Market Rationale

When companies engage in diverse markets with diverse products, they often mirror a divisional base structure. These divisions then have sovereignty about what to offer to whom.

Consider Liebherr. The company is active in branches ranging from mining and earthmoving technology to refrigerators and hotels. Accordingly, the specific requirements for a remote monitoring service and the characteristics of typical customers can vary a lot. Establishing a central industrial service unit is, therefore, at least disputable.

Consequently, the *Market Rationale* configuration suggests that these companies have individual service units within each division. There might be project groups or committees that meet every quarter to exchange ideas, strategies, and standards. But in general, the division determines the entire service, including its development, sales, and delivery.

While companies usually show a good fit for the smart service aiming at the needs of the customers in the interplay with the respective products within their division, the main challenges concern the redundancy and standardization among the entire

company. Platforms, tools, or software that are used by one division might not be used by another. In the worst case, divisions have overlapping customer groups and do not offer compatible service approaches, or even do not know about their colleagues, who just sold a similar service one month before.

Transitioning to the *Hub & Spoke* type, or something similar, including a central unit overseeing these topics, could be a possibility to relieve these problems, whereas giving up tasks and responsibilities is often not associated with the strengths of division heads.

2.2.8 Service Nexus

The last type is the sole representative of a matrix organization. While other configurations can be adjusted or superpositioned to result in a similar design, *Service Nexus* describes an example of a configuration where a smart service function overlaps with the market- or product-oriented divisions.

The advantages are obviously that the service unit can coordinate the development centrally, while the knowledge from each division provides valuable input to increase its suitability for and compatibility with the specific products and customers. This configuration helps to ensure standardization among the platforms, tools, and software, besides offering the opportunity to scale developed solutions at one division throughout the adjacent departments.

However, frictionless operations may be an issue as its implementation can be difficult. Division heads could fight for scarce resources, wherefore this type is prone to political games. Yet, if manufacturing companies install a nearly seamless working version of this type, long-term sustainability is not a problem.

We showed that each type has certain advantages and shortcomings. Various attributes characterize the configurations, on which we elaborated briefly during their descriptions. When a company feels the need to reorganize its current structure, it has to meticulously assess which design might be suited best depending on its contingencies.

As we already stated in the introduction of the typology, selecting a configuration is one thing, but it entails the customization and implementation of the new structure into the firm.

Cycling back to the example of the machine tool manufacturer presented before, we remember that it partnered with an external software company to provide the remote monitoring service, while the company leveraged the skills of its employees to develop the dashboard service. Moreover, the CEO declared preferring to build up the knowledge required for the predictive maintenance service internally.

Browsing through the available types, we could propose multiple options. Assuming that the company offers a wide portfolio of machine tools, but nothing greatly different than that, to customers with similar requirements, there is no need for strong market orientation. As we introduced the manufacturer as a mid-sized company, we suggest a separate service organization. The service organization splits into one unit handling physical services and a team addressing the smart service business. Technological developments in terms of software, sensors, and data should be clustered into another separate organizational entity adjacent to the product and

service business. Each competence center can nurture its skills individually, while a project team or steering committee ensures the alignment of all activities toward the mutual goal of developing the predictive maintenance service. Establishing the committee is key to preventing solo efforts, but may cause discussions and dissatisfaction among important players in the game.

Restructuring measures are often highly political endeavors, which may lead to tough decisions. As communication and transparency are crucial in these situations, we focused on logical arguments for and against potential configurations.

3 Managerial Implications

Manufacturing companies need to accommodate the right organizational structure when introducing industrial services. Depending on the service strategy, the kind of offered services, and other contingency factors, the typology can be used to inspire the reorganization process. While we developed the typology with special attention to new, smart services, the specified configurations are still valid options for companies that are at the beginning of their servitization journey.

When selecting a preferred type, companies need to meticulously address the associated advantages and shortcomings, as well as customize the quasi-fictional representations to the present contingencies. To systemize the selection process, we propose the following five steps adapted from Osterrieder (2020):

1. *Reduction of feasible solutions*
   The general composition of an organization relies on a functional, divisional, or matrix structure. We recommend reducing the solution space by eliminating those types, which are based on those two fundamental structures not similar to the one of the focal company. Yet, a manufacturing company that follows a divisional structure, for instance, can still deliberately choose to look into functional configurations to stimulate the reorganization process.
2. *Screening*
   During the screening phase, a closer examination of the potential configurations takes place. The focal manufacturing company should familiarize itself with the characteristics of each type by focusing on two things. First, the company can delineate the similarities between the potentially new designs and the actual organizational structure. Second, it may look into aspects opposing the current situation.
3. *Preselection of preferred types*
   The preselection of preferred solutions may come naturally or has to be discussed in depth—either way, a choice needs to take place at that point. When examining the available types, the company should ask: Which types would fit the current situation, the corporate strategy, and especially the service strategy the best?

   Here, we have to note that this exercise may be accomplished in a short amount of time to obtain the initial feedback and trigger discussions. However,

to build an organizational structure with long-term sustainability, we advise first to define a clear service strategy, if the company has not done so before.

4. *Prioritization of preferred types*
   The fourth step aims at finding a single solution that the company should implement afterward. In striving to transform the organization, we customarily want to choose an optimal configuration eliminating all shortcomings. However, all types have certain weaknesses that may or may not have dramatic effects on the focal company. It is therefore essential to delineate whether these drawbacks depict lower barriers a company can overcome or that may not have an impact on their business at all, and those that could turn into real roadblocks.

   The company should eliminate those types whose corresponding drawbacks require significant resources to overcome, leaving a more suitable type, considering the current capabilities and culture.

   Nevertheless, once the company discovers during the customization and implementation stage that the favored type evokes major roadblocks, it is possible to cycle through steps 3 and 4 iteratively.

   Additionally, it is worthwhile to note that the approach focused so far on the selection of one suitable type. But it is not limited to only a hybrid configuration of two (or more) types. It may even provide completely new insights, yet, those may come with increasing complexity.
5. *Customization and implementation*
   We learned before that customizing and implementing the selected type is a crucial step to make it a reality. Along with it will be various problems, discussions, and decisions, all of which have a highly individual nature. Offering further guidelines is, therefore, nearly impossible. Yet, we want to emphasize that the entire process needs to be managed with care, attention, and commitment, as introducing a new organizational structure implies multiple adjustments, including changing processes and roles.

4 Summary

Finding the right structure is vital for companies to drive performance, especially when an organization embarks on a transformational journey adding formerly unknown or unaddressed subjects to the existing business.

Manufacturing companies will have encountered organizational change before, but introducing services entails different capabilities and mindsets that oppose current approaches. Product organizations are generally engineering-dominated and technology-oriented. Contrarily, service organizations focus on the happiness of the customer and adopt a customer-centered development style. The clash between these two philosophies regularly concludes with a disadvantage for the service business, sometimes leading to the service paradox.

Concerning physical services, however, discussing the organizational design is not a new phenomenon. Scholars and practitioners have shown that primarily integrating or separating the service business can work depending on the individual

contingencies of the firm. While we found that separation is favored in many cases, it should be questioned in the light of new, smart services.

Providing smart services implies the collaboration of formerly highly independent functions, as we have seen before. Formulating direct guidelines to solve this chaos is, thus, complicated.

Essentially, we came up with a typology of eight different organizational configurations that describe feasible solutions for most manufacturing companies. These can be used during a restructuring process, which adheres to the five steps: reduction of feasible solutions, screening, preselection of preferred types, prioritization of preferred types, and customization and implementation.

Customizing the selected configuration is imperative and should not be underestimated. Succeeding implications concern core and enabling processes or activities, which we detail in the upcoming chapters.

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