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Challenges of the Digital Transformation – Comparing Nonprofit and Industry Organizations

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Abstract. Digital transformation (DT) describes technology-based improvements in business processes, business models, and customer experience. It promises efficiency gains for industrial enterprises. Nonprofit organizations also expect advantages from DT. However, barriers hinder realizing all its possible advantages in both sectors. If decision-makers recognize the potential barriers, they can reflect upon these challenges and take well-coordinated countermeasures. Orienting towards a Straussian grounded theory approach, a framework of barriers is developed with data of two diverse sectors: industry and nonprofit. According to the framework pre-conditions such as profit-orientation and size shape the possibilities to tackle different barriers. In general, the DT process in the industry-sector has been slowed down by barriers. Whereas, nonprofit organizations often take the view that they are not in a DT process at all. This might be due to limited individual and organizational perspectives. Especially, NPOs have to work on their recruitment of skilled volunteers to challenge this view.

Keywords: barriers, industry 4.0, nonprofit organization, digital transformation, qualitative study

1 Introduction

Digital transformation (DT) has massively shaped processes involved in value creation and will continue to do so in the future. This fundamental change has reached almost all areas of life and is by no means uncontroversial in its social effects [1]. It is characterized by the use of new digital technologies to enable significant business improvements [2]. Industry often acts as a role model when it comes to efficiency gains, dealing with realizing other forms of value creation and dealing with the changing nature of work [1]. Especially, advanced manufacturing, which is an important sector in the German economy, is working on its DT and is rather advanced in its journey [3]. DT is also making advances in the social sector. Still, it is lacking behind if looked upon health care or hospitality sectors [3]. However, little information is available about the DT of the nonprofit sector [4]. Nonprofit organizations (NPOs) face increasingly more challenges that are subject to both the

principles of the market economy and technology [1]. Competition for support and financial assistance also increases. Therefore, NPOs must think and act more like profit-oriented companies. Digital technologies in NPOs can increase capabilities to build up competitive advantages, such as improved connection to donors to handle requests and the ability to provide more targeted information [5, 6].

Barriers to DT can hinder or stop the successful implementation of DT. Decision-makers in both the manufacturing sector and in NPOs must understand the opportunities and challenges of DT [4, 7]. Only when the nature of the problem is clearly defined can countermeasures be taken to overcome the challenges.

This paper aims to develop a theoretical framework for barriers to DT. It will help to foresee barriers and understand their potential effects. This article compares two sectors that have a vast difference in conditions. The manufacturing industry is used as a benchmark for DT to gain more insights into the relatively under-researched field of DT in NPOs. This scientific work aims to answer the following research questions: What barriers to digital transformation in NPOs and the manufacturing industry exist? What fosters the differences between the two sectors?

This article follows the scientific discussion about the specific challenges of DT [8]. The collected qualitative data provides comprehensive insights into the perception of DT barriers. In this contribution, the nonprofit sector involves the use of digital technologies in an environment that is characterized by social responsibility. The manufacturing industry, on the other hand, embodies the profit-driven actor within the DT. Combining both areas, looking at differences, and enabling mutual inspiration are essential steps towards a more holistic view of DT, which follows Yin's idea of having diverse data [9]. The detailed description of the barriers to DT may act as a basis for future studies on how to overcome them.

The following study is based on the Straussian grounded theory method [10]. Grounded theory permits the generation of theories derived from data to understand the social context [11]. DT influences the social context due to the socio-technical implications of ubiquitous technology use. Therefore, the goal of this study is to develop a theoretical framework that spans and captures this social context. There are five subsequent steps to conduct this research: Literature review and motivation of research questions (1), purposeful sampling (2), data generation (3), coding and side-by-side comparison of results (4), development of a common framework and discussion with literature from the review and further literature (5).

2 Theoretical Foundations

DT empowers innovations that involve the combination of information, computer, communication, and connectivity technologies. The digital possibilities available to companies increasingly alter an enterprises' strategy. Still, DT processes would remain very individualized. In the following, a short overview of actual research on barriers to DT is presented.

A scientific literature search to identify current, reviewed, and academic results regarding barriers to DT was undertaken, focusing English publications in the Scopus

database. The search terms from the field of barriers research (barrier OR obstacle OR constraint OR challenge) with terms from the field of DT (digitali* OR “digital transformation”) were combined and findings from the subareas of medicine, chemistry, nursing, and other non-topic related fields were excluded. As this research follows a holistic view, “digitali*” was a search term. This term embraces more DT cases than a search for specific technologies. The search was limited to research papers, articles, and conference proceedings and only searched in titles.

In total, 67 articles were identified. The majority was published in 2019. There was no dominating journal or conference. As a second step, the authors went through the titles and abstracts to exclude further articles that were off-topic (4 articles). They dismissed articles that lead too far from the focus of the research, including, for example, country reports, the field of higher education, and digital government (28 in total).

To structure the papers for a better understanding, the authors aligned the articles to different clusters of DT drafted by Morakanyane [12] to give a comprehensive overview of the barriers to DT.

11 publications in the area of business models were found, they range from general industry insights to specific research results in different areas [13–15]. From an epistemological point of view, research has led to research agendas [16], decision support guides [17], and a stepwise model for the implementation of DT [18]. A total of ten articles are devoted to the challenges of transforming operational processes. Some articles deal with obstacles to the introduction of concrete procedures or tools, such as digital supply chain management [19], building information modeling [20], or lean visual planning [21]. Machado et al. [22] and Sjödin [23] present barriers in different maturity stages. A literature review by Kuusisto [24] presents different technology acceptance models and concludes that more profound research on organizational requirements is still needed. Companies have to consider digital change not only at the technological level but also at the socio-technical level [25]. In particular, groups that have little digital know-how, such as elderly employees, need training to be able to adapt to changing requirements [26]. New forms of work, such as digital platforms, will also pose challenges to the legal framework of the employment relationship [27]. One article deals with the challenges of the organizational culture when DT shapes the supplier-buyer relation [28]. In such settings, technical problems, organizational restructuring, and a “not invented here” syndrome may hinder the transformation process.

The cluster infrastructure aggregates nine publications. Here, the articles deal with challenges to the DT of businesses and their structures. The infrastructure does not only include the company’s organization but also growth into an inter-organizational network as a result of the increasing vertical integration of the value chain [29]. For this, IT security is an essential factor [30].

One cluster is about recent research topics in the era of DT. Three articles directly address researchers. The findings show a lack of interdisciplinary research [31, 32] and a need to examine organizational frameworks to master the challenges of the DT [32]. A variety of barriers exists when enterprises aim at DT. The DT process alters business processes, organizational structures, and the way people work and

communicate. So far, research has only brought up unstructured lists from distinct perspectives, thus showing a clear research gap [33]. A framework that embraces the majority of barriers and sets them into relations is still missing. Furthermore, the existing research concentrates on specific profit-oriented sectors. However, DT is not limited to businesses – it also massively shapes social interaction.

In general, little research exists in the field of NPOs [34] and their DT [4]. The use of modern technologies enhances the value creation and reach of NPOs. Besides, IT gives a competitive advantage by providing quick responses to donor requests and targeted information [5]. NPOs can use IT to improve the efficiency of service delivery and fundraising. Using digital technologies helps to share best practices, enable access to information, raise awareness of community issues, and share information about their activities to gain legitimacy [5]. To facilitate public fundraising, NPOs must take advantage of IT, especially web and social networking technologies, to build and maintain their customer and donor bases. Also, NPOs are under increasing pressure from donors to implement IT to collect and report data for performance evaluation [6].

However, DT's barriers stand in the way of these measures. Some significant obstacles are the lack of a strategic vision, the inability to identify skilled workers, and the increasing complexity of the organizational impact [4]. Innovations are rarely used in NPO to increase financial performance. Decision-makers in NPOs must understand the challenges of DTs [4] and their complexity if they want to handle them successfully [35]. A clear structure of barrier dimensions may help identify the significant obstacles, taking it step-by-step.

3 Method and Research Process

As DT is a complex socio-technical phenomenon, the authors orient towards the Straussian grounded theory approach [10]. To answer the research questions and to not miss out on important concepts during the course of the research, a five-step research approach was conducted.

Recent research about barriers to DT was examined to define the state of the art (step 1, cf. chapter 2). Due to the lack of a coherent framework, a research gap was deduced. The formulated research gap leads to the research questions of this study.

In step 2, a purposeful sampling method was applied [11]. To come to a carefully selected sample (table 1) with a clear focus on DT's experience and process, respondents within professional networks were identified. This survey explores the opinions of a representative sample for both sectors. In a first round 30 interviews in industry (related) sectors and 9 interviews in NPOs were conducted. Additional data from 10 industry and 7 NPO participants could be gathered in a second round to proceed the check for the theoretical saturation [36]. In sum, data from 56 interviews was collected.

Table 1. The Sample

Sector	Area	Case	Role
NPO	Social	NPO_S1- NPO_S7	Press Officer, Instructor for national work, Administrative Employee, Pedagogical Management, IT-Management
NPO	Health	NPO_H1- NPO_H5	Managing Board, Speaker fundraising, Press Officer, IT Manager,
NPO	Education	NPO_E1- NPO_E3	Deputy Manager, Managing Director,
NPO	Culture & Recreation	NPO_C1	Technical Manager
Ind.	Automotive	Au1- Au14	Head of R&D, Engineering, Digital Manager
Ind.	Agricultural Engineering	AC1-AC9	Head of Quality Management, Managing Director, IT Management, Operations Management
Ind.	Plastics Industry	P1-P5	Head of Production, Shift Supervisor, Project Engineer
Ind.	Steel Industry	SI1-SI4	Managing Director, Manager/Head of Production Intelligence
Ind.	Other Manufacturing	OM1- OM8	Business Development Manager, Deputy Operations Manager,

For the data generation (step 3), a joint interview guideline was used.

(1) Introduction of the interviewee and description of the changes that occurred in the processes of the companies by DT.

(2) A free narration of the current situation of DT in general and DT barriers.

(3) Summary report on three major obstacles to DT.

The interviews had an average length of 37 minutes and were conducted in German. All the interviews were recorded, transcribed, and translated.

An open coding technique helped to identify specific barrier dimensions and their characteristics in step 4. A team of independent researchers went through the texts and marked sentences, fragments, and passages as codes. In the next step, the axial coding was proceeded. This step results in the identification of the characteristics. For the comparison of the two industries by contrasting the results, the selective coding was applied by taking the codes from the manufacturing industry sample as a basis. A comparative and contrasting approach can lead to mutual learning regarding the perception of barriers. The analytical induction [11] led to a detection of similarities in the codes and allowed to group them into characteristics. To find even more focused dimensions, a third selective coding was applied. These dimensions represent the variables in the grounded theory. In both sectors, the dimensions of barriers are identical but differ in details and preconditions. Relations between the dimensions and their influence on the DT process were developed. Furthermore, variables could be defined that shape these relations (step 5).

4 Presentation of Results

The result of this grounded theory approach is the development of concepts and categories. Due to the different sample sizes, there are no gains by counting the codes or statements. This is why examples of the dimensions' characteristics are given, instead. Further, some key quotations taken from the interviews provide insights. In the following, the dimensions of barriers to DT for the industry and the nonprofit sector are described and defined. Furthermore, the overlapping and differences of the characteristics in the two branches compared are shown.

4.1 Organizational Barriers

One barrier dimension directly affects the organization, for example, when making strategic decisions. Organizational barriers are influenced neither externally nor by single staff members. Furthermore, they embrace the organization as a whole, guided by management. Organizational barriers reflect challenges that arise by the lack of resources and a missing DT vision. "We have no special strategy" (NPO_H4) is a typical statement that indicates the existence of barriers on the organizational level.

The lack of educated staff is a topic that affects both sectors. Industry in particular has a lack of trained specialists who can bring in knowledge at a very high level and thus keep the transformation process going. The focus here is on specific IT knowledge: "Mechanical engineering companies are missing software and IT knowledge" (OM1). Process knowledge is becoming more critical in the industry because DT cannot be successful "if you implement the new technology without questioning your processes," (AC7). While the industry sector moans about missing skills, the NPOs suffer from the severe lack of resources of employees and volunteers: "The social sector often suffers from a shortage of staff" (NPO_S5). The interviewees also attribute this problem to the fact that people who work in social professions rarely have IT training in their education. In the field of voluntary work, many believe that work is limited to services with intense social interaction. The NPOs are asked to show more strongly that administrative support is also sought.

In addition, both sectors do not sense the profits of the DT. In the NPOs, the DT seems to be a kind of black box. Possible benefits cannot be named, so "[...] in the moment the financial resources are only sufficient to maintain our consulting process and finance the ongoing business" (NPO_S3). Thus, those responsible shy away from investing money in the unknown. IT structure when they cannot precisely list the benefits. As a result, there is also a lack of employees able to promote the long-term efficient use and integration of IT: "We have no CDO [Chief Digital Officer]" (NPO_H2). Holding on to traditional roles, principles, or working conditions hinders the DT. This problem occurs in both sectors: "You need the courage to rethink your business model" (Au5). While the resistance of this cultural change is, in industry, based on a kind of inertia, in NPOs, the change resistance is a result of missing IT skills.

4.2 Individual Barriers

Individual barriers are defined as perceptions, assumptions, and feelings about DT and technical innovations. Individual barriers include measures influenced by the individual. In the area of individual barriers, perception in the two sectors continues to diverge. In NPOs, there is a more significant general skepticism towards technical innovations. Here, the employees fear the abuse of data for the social system more than threats concerning their jobs (NPO_E1). The lack of acceptance has two main sources: the structure of the staff with only basic IT skills and the therapeutic as well as social service provided by the NPO, which cannot easily be extended by digital technologies: “What we hardly can get away from is this form of counseling, which we now have” (NPO_H1). The digital goods are supposedly anti-social and therefore do not fit in well with the welfare ideals of the NPO: “If tracking possibilities in the future can be used to determine very accurately individual disease risks, then I fear that this could lead to the undermining of a health insurance system based on solidarity” (NPO_S1).

In the industry, there seems to be less skepticism about new technical innovations in general. However, refusal of certain technologies may occur: “There is a mental hurdle that data stored in the cloud is lost and no longer mine” (OM7). The respondents in the industrial sector also tend to see technology as a personal threat in their area of work: “This implies that we could theoretically check why Colleague A produced more than Colleague B. This is a big problem for our works council” (Au1). The fear is that traceability of performance will lead to increased monitoring of work and more comparability, which will be perceived negatively. Moreover, employees in this sector fear the loss of jobs and the replacement of their services by machines to a greater extent than in the nonprofit sector. However, many respondents believe that in most cases jobs will change rather than be lost: “Automation always means that jobs will change. We try to balance efficiency gains through growth and new products. In the end, these jobs do not disappear, but change” (OM1).

4.3 Technical Barriers

Technical barriers affect the interplay and integration of technical resources. For both groups, the technical barriers show that the use of single technologies is not enough to be successful. Interfaces, as well as seamless integration, are significant issues for both. There is a dependency on other technologies like “mobile data. No matter if this affects the internal infrastructure or the infrastructure outside” (OM5). NPOs also suffer from insufficient network availability, as they often work in remote areas. Moreover, “data security” (OM1, SI3) is mentioned in the industry sample, as companies are worried about hacker attacks (OM2). Hackers could shut down entire factories because the machines are connected via the internet or market relevant information can get into competitors’ hands. Especially “security in the meaning of exchanging information with customers and suppliers” (P3) is experienced as a challenge due to the increasing flow of information.

NPO interviewees on the other hand emphasize the technical infrastructure as challenging (NPO_S4). They complain about data quality and interfaces: “So just a big and complex company like ours, where the documentation software has to harmonize with the personnel software and with our basic communication channels. This leads to interface problems that are not trivial” (NPO_S1). In the field of NPOs, there are fewer IT solutions available that fit their needs exactly. NPOs often employ people who are more dependent on help and supporting structures. For them, the digital interface must be as barrier-free as possible. “The reading effort must be as low as possible” (NPO_E3). Those solutions are rare and may trigger the digital divide. Furthermore, the storage of sensitive data challenges the NPOs, by identifying suitable software products. “We are not legally allowed to use this at the moment” (NPO_S6).

Both groups mentioned the current infrastructure and cost of technology as barriers: “Especially, if you have machines that are a bit older, the conversion is not worth it” (AC8). The interviewees from the industry sample report that pilot projects lower the risks. But not every technology introduction can be realized with a pilot project. “For example, I can’t just introduce SAP in a single production plant. If I introduce SAP, I must do it completely with one launch” (Au8).

4.4 External Barriers

External barriers are all those that cannot be influenced directly by the company or the individuals in the company. The industrial companies mainly see barriers in the area of missing standards (OM2, OM3, Au5): “We need to agree on standards on how to exchange the information” (Au5). The lack of standards affects interfaces to customers and suppliers, which should support the entire value chain.

Missing laws that guarantee data security and protect data from unauthorized access are of great importance in both sectors [37]: “There are legal problems. Maybe you need the contract processing done by the technologies” (OM2). NPOs often work with sensitive data (for example, in the field of child welfare). The fear of the lack of legal expertise is why the handling and protection of data is an important issue that requires excellent and comprehensive legislation: “You always have to make sure that data protection is adhered to” (NPO_S2). For example cloud-based software solutions have to be carefully reviewed. “We have to look closely at whether the companies are based in the European Union or not” (NPO_H4). NPOs, in contrast to the industry, emphasize almost too many legal constraints. In addition to legal data protection requirements, many NPOs also have to comply with internal data protection guidelines laid down by the parent organization (e.g. church bodies) (NPO_S6). The regulations lead to a higher workload in administration. “In addition to one full-time employee who took care of the people, we needed another full-time employee for the bureaucratic effort.” (NPO_E2)

Table 2. Comparison of the characteristics

Dimension	Characteristic	Current topic	NPO	Ind.
Organizational	Missing vision	Possible benefits cannot be named	X	X
		Lack of strategy	X	X
		Holding to traditional roles	X	X
	Lack of resources	Absence of employees/volunteers	X	
		Lack of DT budget	X	X
	Lack of IT skills	Lack of IT knowledge	X	
		Lack of deeper IT knowledge		X
		Lack of process knowledge (high level)		X
	Lack of training	No training, the strategic need is unclear	X	
		Lack of training in the enterprise		X
	Resistance to cultural change	Missing IT training in education	X	
		Adhere to established processes	X	X
Lack of new roles	Missing knowledge about possibilities		X	
		No explicit new roles, e.g., that of a CDO	X	X
Individual	Fear of transparency	Fear of data abuse	X	
		Loss of data control		X
	Lack of technology acceptance	DT regarded as anti-solidary	X	
		Digital products do not fit in the services	X	
Fear of job loss	High personal risk aversion in unemployment by computerization			X
				X
Technical	Technology dependency	Limited mobile data access	X	X
		Lack of open interfaces		X
	Current infrastructure	Cost of technology seems too high compared with the expected value	X	X
		Lack of sector-specific standard programs	X	
	Data Exchange	Data security		X
	Data quality	X		
External	Legal barriers	Too many constraints	X	
		Fear of data theft		X
	Lack of standards	Missing data interfaces		X
		No customer pull	See no need for DT	X
	Lack of customer technology acceptance	X		

The external barriers of NPOs also tend to show up as a lack of interest or worse as boycott on the part of customers, as many of the services offered cannot be replicated by technical solutions. Often, the problem is due to the customer structure (older people, people in need of protection, children) in which very little customer pull is expected. “It is also again this regional problem. Therefore, these are places where many old people live that you can hardly reach. At least not through the social media or something like that.” (NPO_H4) In industry, the customer is often part of the digital value creation chain. Here, external boycott from the customer are rare: “That’s the driving force. Less waste, higher customer satisfaction” (AU5). Table 2 gives an overview.

5 Development of the Theoretical Framework and Discussion

The framework aims to contribute to close the research gaps identified in chapter 2 by 1) structuring the barriers to DT, 2) setting them into relations, and 3) giving first hints on how to overcome the barriers. To support the suggested framework, the findings are linked to related research streams identified in the previous literature review.

The organizational barriers are mostly identical in both areas. The interviewees blame the lack of an IT strategy on a lack of appreciation, combined with a focus on operations. However, the organizational barriers differ slightly: The nonprofit sector suffers from a lack of trained personnel, while the profit-oriented sector emphasizes a lack of specific training on a high IT-knowledge level. Especially, in industrial enterprises there is and has been focus on having connected and transparent supply-chains [29]. SCM concepts are less visible in the NPO sample.

Another dominant problem is the company’s willingness to undertake transformation. The lack of transformation readiness is described in its fundamentals in the literature [5, 19, 38]. Although some authors already described the creation of digital services such as consulting [39], the advantages of IT are not yet fully known in both samples. The respondents often claim that their services cannot be digitized. Here, the educational background of the respondents plays an important role. The employees’ (IT) experience influences the perception of the DT process.

The absence of an IT strategy [8] is responsible for missing resource allocations [22]. Nevertheless, the creation of a DT vision is not yet a topic among NPOs [4]. This lack exists for NPOs and in the group of industry that works predominantly in the smaller enterprises [40]. A first step towards the introduction of a digital strategy is the development of a social media strategy. Privately funded NPOs are more likely to develop social media strategies. They use social media to recruit donors and to draw attention to their activities [41]. The importance of an IT strategy is recognized in some enterprises, but the problem has not even been solved in the industrial sector [7, 17, 18, 42]. Both industries would benefit if they rise to the challenge and make having a digital strategy a long-term corporate focus [8].

Corresponding roles could promote and accompany the DT holistically [43]. Here, NPOs could learn from profit-oriented companies. There is a link to the role of the

education sector, as voluntary work is a critical issue for the interviewees. It may be an issue for industrial countries in particular, but NPOs suffer from both a lack of employees and a massive lack of volunteers [44].

Individual aspects play a crucial role in the effectiveness of NPOs [45], as they often influence the training and professional development of people [25, 46]. Well-trained employees can drive digital change [8, 47], as they have a more positive approach [48]. Older members, a smaller enterprise size, and a low degree of formalization in associations might hamper the DT, but training may help to minimize the imbalance [47]. In the interviews, a less skepticism toward DT was observed when the respondent had an IT-related background. There is a clear need for mutual diffusion between the two sectors. What employees learn in profit-oriented enterprises can probably also find their way into the knowledge of employees in NPOs in the long run. Also, it is down to the NPOs to reconcile the role of digital change with social responsibility. Solutions for the threat of job loss and transparency [27] are rarely mentioned in barriers to DT research so far. However, social sciences show its urgency [1]. There is a lack of social approaches and far-reaching protective provisions [49]. The integration of an agile culture [50] is expected to take away many individual fears. Here, industry can learn from NPOs. Relational job design seems to be a key for establishing a culture of trust [51] through which employee engagement could blossom. If NPOs can attract talented volunteers and employees by providing an agile environment it would help to overcome missing IT skills and become more innovative. In return, this will impact the NPOs' digital capabilities to interact with stakeholders [52].

The results of the interviews show a wide range of fundamental problems at the technical level. Some companies are already making headway in the DT process. Their barriers are concrete and at a very high technical level [53]. However, in other companies, especially NPOs, DT is just beginning. There is a lack of necessary interfaces and knowledge about integration and security possibilities [30]. In this field, there are substantial overlaps to the formulated problem of the missing added value (organizational). The recognition of the DT maturity [54] can be the first hint for future actions that have to be taken in order to foster the DT process, although NPOs do not actively perceive the technical challenge.

The perception of the external barriers differs most. While industry suffers from a lack of laws and an unclear legal structure, NPOs have to cope with rigorous legal requirements. The requirements are based on their clear link to healthcare and welfare, and the topic of uniform legal requirements is discussed in the literature [55]. Nevertheless, there are still uncertainties of ownership rights and the juridical background to be declared. Legal structures shape customer–supplier relations. There exists a customer pull, including new requests for the management to consider [56] and a disaffirmation of digital customer services in the nonprofit sector. Overall, the extent to which external barriers can have an impact appears to be dependent on the enterprises' profit orientation.

Figure 1 shows the theoretical framework of barriers to DT. In both sectors barriers from all dimensions were found. Four dimensions of barriers negatively influence the DT process. The DT process shows the degree of the DT of services and products as

well as the DT of processes [54]. The dimensions help to show where the DT barriers occur. The characteristics, described in chapter 4, express the nature of the barriers. They are useful for the later operationalization of the dimensions to develop a reliable scale for DT barriers.

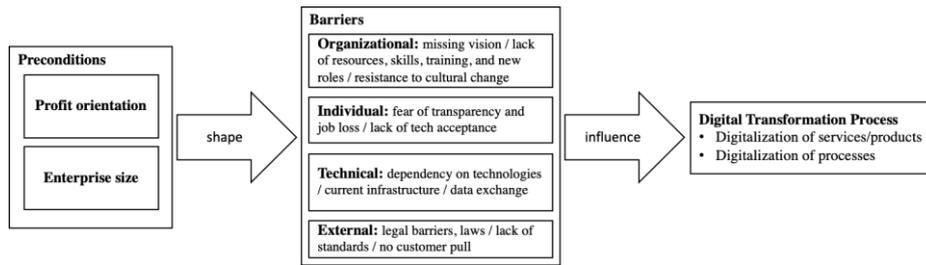


Figure 1. Theoretical Framework

Two dominant preconditions shape the characteristics: profit orientation [57] and enterprise size [58]. These characteristics define the problem-solving paths. There is an apparent practical use. When problems occur in the field of organizational barriers, such as lack of training, the characteristics give a hint as to how the problems can be solved. In smaller enterprises, predominantly in the nonprofit sector, the recruiting of technical experts can be a possible solution. Further, NPOs could recruit younger volunteers to develop social media campaigns. Outsourcing administrative functions like IT management can be a solution for smaller enterprises and NPOs [58]. The NPOs would only have to pay for actual needs and would not have to finance a whole post for IT management.

6 Contributions and Limitations

Our results contribute to the ongoing research discussion on the social effects of DT. This paper shows that barriers, especially at the individual level, are influenced by social implications. In NPOs, services often focus on disadvantaged people. Also, NPOs are dependent on volunteers whose training can be less actively controlled by the company than in profitable companies. NPOs are more likely to encounter the so-called “digital divide” with both their customers and their volunteers [59]. It may foster further digital exclusion for the NPOs if they cannot cope with technological innovations. The framework is useful for researchers, as it gives an idea of how the barriers influence the DT process. For practitioners, the model can be useful to understand which next steps have to be undertaken to minimize the challenges for the DT process. More research with a focus on NPOs, and DT’s social responsibility is needed.

The worlds’ current situation is changing. The coronavirus forces many organizations into a DT. The organizations had no time to prepare for that change. So we assume a hidden skepticism will remain. There is a fear that some will make

steady progress with technology while others are left behind. A social strategy that refers to responsible use is needed, as NPOs take responsibility for societal problems.

Despite the careful approach, this research is not without limitations. A vast number of interviews were conducted with interviewees in the automotive sector compared to the remaining sectors. A wide range of experience in DT characterizes this sector. Further, the sample of NPOs includes organizations with an international reputation. In such global organizations, one would expect a higher level of DT acceptance members from regionally acting groups were often interviewed. Here, a closer look at contrasting impressions from the same organization may be of interest for further study. Furthermore, the IT experience of employers influences the perception of the DT process. These influencing factors may explain why the NPOs often regard themselves as not IN the DT process yet. Qualitative research is useful for developing a theory. At the moment, this theory is not statistically proven. Although, there is a well prepared assessment, a careful operationalization of the dimensions involved is needed.

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