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# Developing and Executing a Digital Strategy in a Manufacturing SME – Reports from an Extensive Case Study

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**Abstract.** In this paper, we report the findings from an extensive case study in a manufacturing SME. We have followed their strategic work and organizational development since Autumn 2022 and we are continuously monitoring and investigating their digital transformation endeavour, with a particular interest in the importance of a digital strategy and how the management group is executing the digital strategy. In addition, we also account for the development activities they have initiated and how they use the strategy as a beacon for e.g., prioritizations activities and resource, as well as subsequent fundamental changes they implemented in their value creating and supportive processes. The case study includes a rich empirical material, originating from many site visits, where more than 25 interviews have been conducted alongside many meetings/workshops with the board and management group, detailed studies of strategic documents, product portfolios and Gemba walks. The paper also relates our findings and contextualizes findings from our case study to a set of important strategic management capabilities being identified as part of the work process. Finally, we also discuss some lessons learned in relation to the actual implementation of the digital strategy and their strategic management capabilities as well as propose some ideas for future work, including the importance of considering the internal tensions caused by the digital transformation endeavour and manifested via the digital strategy.

**Keywords.** Digital Strategy, Digital Transformation, Digitalization, Small- and Medium Sized Manufacturing Companies, Strategic management capabilities, Industry 4.0, Industry 5.0.

## 1. Introduction

Nowadays, digital transformation (DT) is on the agenda in almost every manufacturing company and many are investing resources in and try to understand and capitalize on the opportunities offered by novel digital solutions. Consequently, DT has become a key process in the era of Industry 4.0 and Industry 5.0. However, although most large manufacturing companies have embarked on a DT journey [1-2], many small- and medium-sized (SME) manufacturing companies are still the early phases and many are striving [3-4] (for clarity, in this work, we follow the European Commission's definition of SMEs, stipulating companies with less than 250 employees



and an annual turnover below EUR 50 million, and or an annual balance sheet below EUR 43 million [6]). To further illustrate the situation in manufacturing SMEs, we refer to [5], claiming that: “the number of SMEs that achieve DT utilization is usually lower than that of SMEs struggling with it (p.16)”. This is unwanted and problematic, especially if considering the economic importance of the manufacturing SMEs for the overall economy. Statistics from the EU shows that the SMEs constitutes more than 99% of all companies. In alignment, they also employ over 50% of the workforce and contributes with more than 50% of the value added [6].

Many have investigated the reasons for the slow adoption pace and many reasons are to be found in the literature. On a general level, [2] identify that many manufacturing SMEs have vastly different starting conditions compared to larger companies, where the SMEs overall digital capabilities and readiness to start a transformation journey is generally much lower. In detail, reasons like e.g., risk aversion [7-8], shortage of resources for R&D [2, 9], as well as limited room for investments [2, 7-9], and limited internal (technical) competence [7-10], are frequently mentioned.

In addition, the lack of a digital strategy is often raised as a key barrier/hinder [9, 11-14]. Ghobakhloo and Ching [10] specifically suggest that SMEs must have strategic roadmaps, since this is one of the fundamental discriminators between non-adopters and adopters. In alignment, [15-16] add that manufacturing SMEs must realize the importance of not only having a digital strategy, but also to align it with the overall business plan and business goals. They emphasize the importance of securing that the goals of the digital strategy support the goals of the business plan, since this is a necessity for developing core business functions in the company.

Still, although many manifests the importance of a digital strategy guiding the DT process in manufacturing SMEs, current literature lack detailed accounts validating such claim. In addition, [17-18] promote the importance of further studies towards manufacturing SMEs, which considers the strategic work conducted in specific companies. Finally, [19] also promote the necessity of more qualitative research related to manufacturing SMEs in general and the importance of digital transformation strategies in particular.

Therefore, in this work we contribute to current research with empirically-grounded evidence regarding the strategic work when digitally transforming a manufacturing SME, with a particular focus on developing and executing a digital strategy. The results of this work also contribute with examples on challenges that may be encountered or conditions that needs to be in place, for successfully developing and executing on a digital strategy. Finally, the findings of this work also contribute in externally validating and refining the structure and content of the blueprint for a one-page digital strategy presented by [18].

The rest of this paper is organized as follows. The frame of reference is elaborated in Section 2. In Section 3 details are given regarding the research method applied. In Section 4, the analysis and results of the case study are presented and a revised version of the one-page digital strategy blueprint is proposed. Finally, Section 5 concludes the paper by putting the results of the work in a broader perspective along with some propositions for future research

## **2. Frame of Reference**

### *2.1 Defining digital transformation*

There are many different definitions or conceptualizations of DT to be found in the literature, emphasizing different aspects or perspectives (e.g. [20-22]). However, we align to the definition originally presented by [23], declaring DT as a phase that occurs when “new digital business models and processes restructure economies”. In making such statement more detailed, [23] also

introduce a nomenclature separating the overall digital transition into three phases, i.e. digitization, digitalization, and digital transformation. According to [24] digitization refers to the conversion from analogue to digital; digitalization refers to the opportunities of reengineering processes following previous digitization efforts; and DT refers to new ways of doing things that generate new sources of value, created by the reengineering of processes and business models.

## 2.2 Digital Strategy

The importance of an established digital strategy is strongly manifested in the literature and many argue for the importance thereof (e.g. [9, 14, 18, 25-30]). In trying to be a bit more concrete on why a digital strategy is a necessity, the literature includes several arguments, of which a few are given below. Ghobakhloo and Ching [10] specifically suggest that SMEs should create strategic roadmaps, since it facilitates the adoption of digital technology by including motives for why the technologies are important, how they may contribute, and when to initiate the projects. They [10] also identify the existence of a strategic roadmap as one of the important discriminators between nonadopters and adopters. Kane et. al. [11] claims that “the ability to digitally reimagine the business is determined in large part by a clear digital strategy” (p.3). Moreover, also [13] articulate the importance of a strong strategic vision, since it transforms the adoption of digital solutions in manufacturing SMEs into a proactive state, which will foster a gradual and continuous grasping of Industry 4.0 concepts and application scenarios that, in turn, allows for a step-based planning and execution. In addition, literature also account for a number of key characteristics of a digital strategy:

- The digital strategy must be related to or merged with overall business goals and business plans [12, 15-16, 18, 25, 30-33].
- The digital strategy must include an overall goal clearly expressing the sole purpose of digitally transforming the company [4, 18].
- Stakeholder groups, internal as well as external, must be identified and prioritized, since trying to transform everything in a big bang approach will most probably end up in an unsuccessful transformation [18, 34]. Visnjic et. al. [35] supports the importance of not aiming for the totally disruptive approach by claiming: “Our research into digital transformation in industrial companies shows that the best approach in many cases is not revolutionary but evolutionary (p. 74)”.
- The digital strategy must express expected novel organizational capabilities emerging from the development work being conducted. Capabilities, and its related effects, are a vital way of expressing how the changes being introduced will alter the way the company conducts its business [18].
- Activities included in the digital strategy must be prioritized, since too many priorities normally hinder the transformation, due to e.g., lacking internal resources [11, 18, 27].

In addition to identify key-characteristics of a digital strategy, [18] present a blueprint for a one-page digital strategy (Figure 1), aimed at guiding manufacturing SMEs when developing and executing on a digital strategy.

The development of the digital strategy (Figure 1) may be done iteratively, but builds fundamentally upon a top-down development, where each section, while working downwards the one-pager, is obligated to align to and support the section(s) above. In short, the purpose of each section is as follows [18]. The strategy takes its stand in an often-found one-sentence statement of the overall business goal of the company. Such statement normally also includes key

<b>OVERALL BUSINESS GOAL</b>		<i>An annual turnover of XX M€, with a revenue on Y % while at the same time safeguarding a positive customer experience, including high-quality products and a delivery precision of ZZ%</i>		
<b>DIGITAL STRATEGY</b>	<b>OVERALL AIM WITH DIGITAL TRANSFORMATION (5-10 YEARS)</b>	<i>Offer the customer customized products that are produced in standardized processes.</i>		
	<b>PRIO. STAKE-HOLDERS (Internal &amp; External)</b>	<b>Internal:</b> - Management processes - Sales processes - Produktion processes	<b>External:</b> - "Big" customers (annual >X M€) - Online customers	
	<b>3-5 EXPECTED CAPABILITIES /EFFECTS (3-5 YEARS)</b>	Full horizontal and vertical data stream in production division X & Y	More sales through online channels increasing sales of standardized products	
		Reduce set up times in production and having larger batch sizes	...	...
	<b>5-8 PRIORITIZED ACTIVITIES (1-3 YEARS)</b>	Complete the implementation of the MES-system in production division X	Revise the product structure and the variation of products	
Finalize investments of machining equipment in production division X & Y		Introduce and update online technology facilitating		
Competence development of staff focusing the ERP-system and MES-system		Implement a project steering system and increasing management engagement in project processes and prioritizes.		
...				

**Figure 1.** A digital strategy for manufacturing SMEs, adopted from [18], p. 638.

performance indicators (KPIs). Thereafter, an overall aim of the DT is developed. The purpose of such section is to define a guiding star for the company, which also express an ambition or a novel general capability that may, in turn, guide priorities and resource allocations. Prioritizing stakeholders (internal and external) is also a necessity, otherwise the formulation of the expected capabilities and related activities may become too general. Thereafter, the formulation of the expected capabilities is a vital step, where there isn't room for too many (typically 3-5). In addition, [18] also claim that the overall idea of formulating novel capabilities also serves as a vital step of moving away from a strong technology association, into a business-related association, fostering an internal DT culture aligning to the definition of DT given in Section 2.1. Finally, a limited number of activities (typically 5-8) must be prioritized and defined, to develop the novel capabilities expected. These activities must be thoughtfully and deliberately prioritized, since most manufacturing SMEs don't have, as mentioned before, the internal resources or capabilities to conducted too many activities in parallel.

### 3. The case study

Investigating the strategic work of digitally transforming a manufacturing SME, with a particular focus on developing and executing a digital strategy, is complex and requires in-depth knowledge of the study object, from a wide range of perspectives. Therefore, we adopted an interpretive stand, allowing us to understanding a phenomenon by exploring the meanings and interpretations that individuals attach to it [36-37]. In addition, due to the exploratory nature of this work, where the studied phenomena are local and emergent, we followed the guidelines by [38-39] and conducted an interpretive case study in a manufacturing SME. In doing so, the work is under the influence of the complexity of the company and the DT process, as well as the complexity of the different sections of a digital strategy. Consequently, no precise measurement

instruments are available and we, instead, relied on the knowledge and experiences of our research subjects in the case company, as well as empirical material from Gemba walks, observations during workshops, formal company documentation (e.g., strategies, policies, and guidelines), and our subsequent analytical interpretations of the material collected.

### *3.1. Selection and presentation of the case company*

In conducting a case-study aimed at an in-depth investigation of a phenomenon, the selection of the particular case is vital and the case must be a proper representative that may contribute with in-depth knowledge and insights in relation to the phenomenon being studied. The case must also function under the premises that constitute the conditions for the study [38-39].

For this work, we selected a manufacturing SME that were in the starting blocks of developing a digital strategy. For integrity reasons, we have anonymized the name of the company. The case company (hereafter referred to as the Company) had been discussing the importance of structuring their digital developments and their DT for a long time and realized the importance of strategizing upon such work. The Company was also known to us and willing to participate in the study. Hence, the selection of the case company followed a purposeful sampling approach. Purposeful sampling is a technique widely used in qualitative research for the identification and selection of information-rich cases for the most effective use of limited resources [40]. This involves identifying and selecting individuals or groups of individuals that are especially knowledgeable about or experienced with a phenomenon of interest [41].

However, to give some contextual information regarding the Company, a description thereof follows. The Company is a family-owned Swedish manufacturing SME, founded over 100 years ago and located in the southern part of Sweden. The Company has approximately 130 employees and a turnover of 22 M€ (data taken from the company's annual accounts for 2024). It has a main business in processing and machining sheet metal into products under their own brand, as well as under other brands (i.e., the company both have their own products and act as a contracted supplier). The Company is active on the Scandinavian, as well as European market and have business relationship with companies of all sizes. It has a strong financial position at the moment and are therefore capable of taking investments needed and finance the activities decided in the digital strategy. The Company has a management group which includes all the common managerial positions that may be expected in a manufacturing company of its size, e.g. the CEO, a production manager, a technological development manager, a financial manager, a quality manager and an IT manager.

### *3.2. Material collection techniques used*

Following an interpretative approach, a variety of material collection techniques were applied. In total, the case study included 25 interviews (ranging between 1-3 hours), 4 Gemba walks in the production facilities, 6 workshops (ranging between 2 hours to full-day workshops), and the study of hundreds of pages of company internal documents, such as the business plan, the digital strategy, the production strategy, the sales strategy, the IT-policy, and quality policies during the years 2022-2025. On top of that, during our collaboration throughout these years, numerous meetings and dialogs have occurred, which also contributes in bringing information and knowledge regarding the Company in general as well as concerns, challenges and contextual facts in particular. All interviews conducted were open-ended interviews were notes were taken and summarized. Since open-ended interviews were chosen, many follow-up questions were stated, allowing the respondents to elaborate upon personal experiences and perspectives. In sampling the respondents, a broadness of perspectives and responsibilities was the main argument, since

a diversity of perspectives and responsibilities was assumed to contribute with a rich material for understanding how digital solutions were considered and also how the digital initiatives were coordinated in relation to the digital strategy. The workshops concerned the Company's current digital maturity and status, developing the digital strategy, following up undertaken activities and insights on executing on a digital strategy, as well as revising the overall business plan as a direct consequence of the increased focus on digitally transforming the Company. The workshops included representatives from the board of the company, as well as the managerial group and other employees with dedicated responsibilities in different functions/areas. During the workshops, notes were taken and the results of the workshops were thoroughly documented. Insights made during the Gemba walks were noted and general facts originating from studying important documents were collected. These notes and facts were also used as a baseline for developing questions for the interviews and to plan and set the purpose for the workshops.

#### **4. Analysis and results**

In this section, we analyze and present the results from the case study. The analysis is guided by and divided according to the key-characteristics of a digital strategy presented above. In addition, each section also reasons on the validity of the digital strategy blue-print suggested by [18] and following our results. We conclude this section by proposing a revised version thereof.

##### *4.1. The digital strategy must be aligned with the overall business plan/business goals*

As indicated above, one fundamental characteristic of a digital strategy is its close relationship to the overall business goals and business plans, due to the importance of safeguarding that prioritized digital initiatives contributes in the fulfilment thereof. Many authors argue for the importance of this anchoring and consequently [18] included it as the starting aspect of a one-page digital strategy. Our finding also promotes the importance of including the overall goal in the digital strategy blueprint. The Company already had an overall business goal established, including different metrics related to expected annual results in relation to turnover, profit marginal, customer satisfaction and delivery precision. Following the blueprint of the digital strategy, it was included. However, during the interviews and workshops, it became evident, via statements from several respondents/participant, that although the overall goal had been discussed and was known (to a varying degree), it wasn't the omnipresent guiding star it should be. Hence, besides guiding the DT strategy, the importance of its inclusion in the digital strategy became evident, since this section of the digital strategy also serves as a constant reminder of the overall goals of a company. Moreover, during the interviews and workshops many respondents/participants also expressed the importance of this "reminder", as a means to "work in the same direction", by keeping a close eye on the overall goal of the business when suggesting and prioritizing activities and initiatives during the management group's meeting.

Additionally, over time the execution of the digital strategy also made the board of the company and the management group questioning the goals expressed in the business plan. We interpret this as a reaction of making the business plan more alive and vivid, since most of the participants had taken the business plan for granted and it did not seem like they actually work very closely and actively with the existing business plan. This resulted in an additional workshop (and several meeting to prepare the workshop), aimed at refining the business plan. Especially the KPI expected turnover got heavily debated, since the management group and the board started to connect an increased digitalization into renewed business opportunities that would cater for an increased turnover. In addition, in the digital strategy, they promote the need to

reduce the number of product variants. This also sparked a discussion on having to remove/terminate whole groups/categories of products. Eventually, the workshop resulted in a revised business plan where some of the KPIs and expected outcomes were refined.

#### *4.2. The digital strategy must express the overall goal of digitally transforming the company*

When uniting upon and formulating the overall business goal of digitally transforming the company, it became apparent that the members of the management group had very different interpretations and internal pictures of what DT really mean and how that would influence the Company. Initially, during the workshop, several of the participants ended up in arguing about vital tools and technologies that should be implemented, instead of formulating one overall goal of their DT. After a few group-based sessions, where the members of the management group and members of the board were divided into smaller working groups, a one sentence goal became distilled per group. Eventually, the participants also managed to agree up one formulation of an overall goal, that would serve as a guiding star for the Company's DT endeavours.

Following the work of the Company during several years has also shown that the formulation of the overall goal has withstand the test of time and ultimately, it has served as a guiding star for them. Given that the members of the management group had very varying interpretations of the meaning of DT, the sentence has been important as a way of manifesting the sole purpose of adopting digital solutions as part of developing the business. Hence, the inclusion of an overall goal for the digital transformation has proven very important, as a means of aligning DT interpretations into one direction. In doing so, it also serves as a long-term anchor for guiding day-to-day dialogues and meetings, since the Company (and most other manufacturing SMEs) is acting in an ever-changing business climate, with constant changes and adaptations, which, over time, risk to dilute what was once agreed upon. Additionally, besides creating a joint frame of reference, it turned out that formulating and documenting the overall goal served another important purpose. Because, although all members of the management group agreed upon or at least aligned to the goal being developed and decided during the workshop, it did not mean that all of them fully understood the implications of the goal and how it, in detail, would influence day-to-day work and the scope of development projects. By documenting the goal and being very explicit on what to achieve, it also gave time for some members of the management group to reflect upon the digital strategy's particular implications in relation to their own's role and responsibilities. Ultimately, the goal formulation gave time for reflection and acceptance on an individual basis. On a later meeting, one of the members of the management group even expressed (translated from Swedish): "I am not sure I liked it initially, since it changed my view of the Company, but as time went by, I started to realize that this is the path we need to take, for being able to compete in the long run!"

#### *4.3. Stakeholder groups, internal as well as external, must be identified and prioritized*

This turned out to be tricky for the Company. In the initial iteration of the digital strategy, it became apparent that the management group as a whole was hesitating in prioritizing stakeholder groups. In addition, following their dialogue and reasoning, it also became clear that they, of course, understood the importance of prioritizing and they all strongly agreed upon the impossibility to do everything at the same time. Still, it took a number of iterations before they started to narrow down internal processes that should be prioritized and external stakeholder to give an initial focus. The result of the first iteration may, a bit harshly, be summarized into the following sentence: "every internal function or division and every customer segment and all other external stakeholders". Even as observers, it took us some time to grasp the actual problem and

to understand that it was not a knowledge problem but a management group culture problem that hindered their progress. Prioritizing is not only about granting opportunities and resources, it is equally much telling a fellow management group member that hers or his division or function will NOT be prioritized. This turned out to be challenging for the Company. Our interpretation is that up to this point, a lot of the resource allocations and project approvals in the Company had foundationally been following a very compromising/"conflict suppressing" approach, where everyone got more or less equally much, all of the time. Now, this culture and traditional approach became challenged and it caused some strains and irritation. Still, to their benefit, they managed to carve out a delimitation of internal and external stakeholder groups to prioritize, without having the CEO to just decide. From a digital strategy blue-print point of view, the whole process in relation to prioritizing stakeholder groups and the challenges it created, served as a vital validation for the importance thereof and the need for allowing it to take some time and debate.

#### *4.4. The digital strategy must express expected novel organizational capabilities*

Interestingly, this key-characteristic also proved to be rather problematic and the company needed a few iterations before the management group managed to agree upon a number of prioritized capabilities. Starting out such carving, it became obvious that most of the members of the management group initially were rather unaccustomed to relate DT into novel business capabilities. Instead, their direct association was related to novel technologies or digital tools. However, after some explanation and showing generic, anonymized examples from other companies, the group dialogues sparked and eventually, they manage to produce a rather extensive list of beneficial future capabilities for the Company. Sequentially, a new problem arose. Strand and Holm [18] propose in their digital strategy blueprint that a company should only focus on 3-5 expected capabilities. This is, in turn, related to the results of [11], indicating that one of the most crucial hinders for immature organizations embarking on a DT journey, is the existence of too many priorities and the potential risk of draining or overstretching internal resources when trying to successfully conduct them in parallel. Once again, it came down to internal culture and being unaccustomed to prioritize. Still, some of the expected capabilities could immediately be omitted, since they neither contributed to the decided overall goal for digitally transforming the Company nor were they related to any of the internal and external prioritized stakeholder groups. Thereafter, the management group got an additional opportunity to iterate the list of capabilities and eventually decided upon five to prioritize and include in the digital strategy. Without being too detailed, they included capabilities in relation to e.g., increased quality of base-lines for decision making and more efficient customer interaction. However, the Company also altered the blueprint with respect to the order between novel organizational capabilities and prioritized stakeholder groups. Eventually, their instantiated digital strategy was reformatted to include expected capabilities before prioritized stakeholder groups. The reason for this was two-folded. Firstly, the expected novel organizational capabilities defined are prerequisites for achieving the expressed overall goal of digitally transforming the company, hence, they need to be directly related in the strategy. Secondly, as part of prioritizing, the novel capabilities are strongly related to various, selected stakeholders (internal and external). Thereby, the capabilities serve as a guiding star for which stakeholder group(s) to prioritize. We find this very relevant and an important feedback on the blueprint developed by [18]. For the blueprint to be applicable and relevant to apply in manufacturing SMEs, such changes need to be included in a revised version of the blueprint.

#### *4.5. Activities included in the digital strategy must be prioritized*

Following the advice of [11, 18, 27], the activities included in the digital strategy must be prioritized, since too many priorities normally hinder the transformation, due to e.g., lacking internal resources. On developing and deciding upon prioritized activities, the Company actually managed to rather quickly come down to a reasonable amount of activities to focus on. Following the dialogue in the management group and our observations, it seems like the prior sections enforcing a need to prioritize, as well as guiding towards an overall goal and expected novel capabilities, strongly alleviated the definition and selection of activities. In addition, most companies are used in working with projects and the management group more or less directly translated activities into defined projects, where the focus and the scope of the projects became related to the overall goal of their DT as well as novel capabilities. Of course, some debate arose regarding already planned projects that got postponed and omitted, but in general, the management group rather quickly settled into a short list of prioritized projects for the upcoming one to two years. On reflecting in relation to the blueprint for a digital strategy, it becomes apparent that the prioritized activities are vital for structuring important initiatives for the upcoming years and to mitigate the well-established problem of internal resource shortage or exhaustion.

During this process, it also became apparent that several internal functions (e.g., technological development and production) in the company was overstretched under the burden of too many initiatives being undertaken and planned. In addition, observing the dialogues being undertaken, it became evident that the concept activity was hard to interpret for the company. In contrast, they, and many others, have a long tradition of working in projects and when clarifying that they should consider activities synonymous with projects, the work became more constructive. Therefore, in relation to the blueprint, we strongly advocate to simply replace the concept activity with project. Especially if it is what's actually intended, since it clarifies associations and alleviates confusion/frustration.

Moreover, in our continuous study on how the Company executes its digital strategy, it's apparent that they have been very successful in including the strategy as a living document and very often, they refer to it in dialogues concerning prioritizations. In addition, the digital strategy has also become a beacon for deciding upon competence development initiatives to focus on and many of the co-worker's outside the management group has been very involved in projects that are defined in the digital strategy. During one of our following up workshops, one of the co-workers involved in product development even expressed (translated from Swedish): "it feels really great to be involved in projects that are strategically prioritized. It makes the work even more fun. Before, we did run a lot of projects, but you never knew if it was really important or where the idea originated from".

Finally, during the study, the Company also raised a problem with the blueprint suggested by [18], in relation to traceability between the different sections, i.e., they found it hard to keep track of and remember at later meetings, how different projects were related to novel organizational capabilities, via specific stakeholder groups. Therefore, they introduced a numbering system, which solved this traceability problem. By observing the benefits of simplifying such threading and how it avoided unnecessary confusion and debate on later meetings, we are convinced of the importance of introducing such a feature also as part of a revised version of the blueprint.

#### *4.6. A revised version of the blueprint for a one-page digital strategy*

Following the results of our study, we propose the following revised version of (Figure 2) the one-page digital strategy blueprint presented by [18].

<b>OVERALL BUSINESS GOAL</b>		An annual turnover of XX€ , with a revenue on Y % while at the same time safeguarding a positive customer experience, including high-quality products and a delivery precision of Z %.	
<b>DIGITAL STRATEGY</b>	<b>OVERALL AIM WITH DIGITAL TRANSFORMATION</b>		Offer the customers customized products that are produced in standardized processes
	<b>3-5 EXPECTED CAPABILITIES/EFFECTS (3-5 YEARS)</b>	Full horizontal and vertical data streams in production divisions X & Y (1,3, A, C, F)	Reduce set up times in production and having larger batch sizes (3, 4, B, C)
		Increased sales through online channels increasing sales of standardized products (2, 4, 5, D, E, F)	...
	<b>PRIOR. STAKE-HOLDERS (Internal &amp; External)</b>	Internal: Management processes (1) Sale process (2) Production process (3)	External: - Big customers (Annual > X€ M)(4) - Online customers (5)
<b>5-8 PRIORITIZED PROJECTS (1-3 YEARS)</b>	Competence development of staff focusing on the ERP-system and MES-system (A)	Revise the products' structure and the variants of products (D)	
	Finalize the investment of machining equipment in production divisions X & Y (B)	Introduce and update online tools facilitating customers' configuration of products (E)	
	Complete the implementation of the MES-system in production division X (C)	Implement a project steering system and increase management's engagement in prioritization of projects (F)	
	...		

**Figure 2.** Revised version of a one-page digital strategy blueprint

The revised version includes three major alterations compared to the original blueprint suggested by [18]. Firstly, the sections expected capabilities/effects and prioritized stakeholders have swapped places, to make the order of these sections more intuitive and better aligned with how companies may reason between expected future capabilities and stakeholder groups influenced by or benefitting from these capabilities. Secondly, the section prioritized activities has been renamed into prioritized projects, following the long tradition in manufacturing SMEs to work with projects. Thirdly, and finally, a numbering system (including numbers and letters) has been included to increase the traceability between included sections.

### 5. Discussions and Future Work

First of all, the findings from this work align with already published work manifesting the importance of executing on a digital strategy for a successful DT in a manufacturing SME. By following the case company during a number of years, we have been able to first-handily observe and monitor their progress while executing a digital strategy. Before the digital strategy was developed, the case company acted like most other companies accounted for in the literature, experiencing problems such as; lacking a common goal, no common managerial understanding on what the DT actually entails, too many projects being initiated, internal resources being strained, lack of coordination between internal functions, and a general challenge in prioritizing sufficiently enough. This situation is now changed and the digital strategy is owned by top-management, who are also allocating sufficient resources for the projects being prioritized in the digital strategy. The managerial ownership is crucial and many advocates the importance thereof (e.g. [4-5, 24, 26-27, 42]). The company is strongly progressing in their DT and projects being undertaken has fundamentally changed e.g., customer interaction, traceability in production processes, and dealing with a large flora of product variants. Fundamentally, although early, they also started to get positive financial indications in relation to profit and product margins.

In addition, the case company has also been very careful in anchoring the digital strategy in the whole organization (advocated by e.g. [26]), meaning that middle-level managers, as well as operators are given the opportunity to understand and accept the digital strategy. Not just as a document, but primarily as a beacon for where the company is heading and related business developments. However, in this case, we deliberately used the notion of opportunity to accept. During our study and despite the confirmation that a digital strategy is a necessity, we also identified that the strategy created tensions in the management group as well as in other levels of the case company. These tensions could easily be neglected or oversimplified as a mere unwillingness to change. However, during our interviews and meetings, we identified strong emotions related to company identity and corporate culture, manifesting strong anchors in the historic fundamentals of the company. In addition, they also indicate that the company has omitted to work with their culture alongside a strong DT, rendering a potential conflict situation which [43] labels as a chaotic company identity. Hence, we raise the following question for future work: is a digital strategy only a beacon or is it also a divider?

In addition, a single case study does pose generalization limitations. Therefore, we advocate the importance of additional in-depth studies investigating the development and execution of a digital strategy in manufacturing SMEs. This need has also been expressed by [15] suggesting the importance of monitoring and tracking the practical implementation of digitalization initiatives as they progress over time.

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