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Measuring Performance of Digital Projects: Case of Swiss Medium-sized Enterprises

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Abstract. *The research objective is to understand the challenges of digitalisation of Swiss medium-sized enterprises and their satisfaction with current measurement methods, and to develop a measurement model to evaluate the performance of their digital projects. The research methodology involved a comprehensive literature review, followed by interviews with experts from 15 medium sized companies. The analysis revealed that Swiss medium sized enterprises not only lack the appropriate tools to measure their digital projects' performance but are also facing challenges caused by the lack of financial resources and time to implement digital projects; and the difficulty of finding the right people to execute digital projects. The results from the research include a measurement model for digital projects. This model supports managers in making effective decisions regarding their digital projects, allocating resources more effectively, and enhancing overall organizational performance. The research outcomes are not necessarily generalizable to other enterprises (other size, other nations). However, they show that in the context of digital projects, Swiss medium-sized companies need a measurement model to evaluate the performance and success since such technologies/projects are associated with financial costs. For future research, the developed model should be tested with different firms in an operational handling where effective past or future projects would be measured. This could further explore the applicability of the model to different sized enterprises or those in other nations.*

Keywords: *Digital projects, measurement model, performance measurements, ROI, Swiss medium-sized enterprises*

1. Introduction

Digital transformation and digitalisation are among the most used terms in management sciences and economics (Härting et al., 2017; Schallmo et al., 2021). In this context and considering that digital projects are associated with certain financial costs, it is essential to measure the performance of new digital projects. More specifically, it is necessary to estimate the performance of new digital projects with regard to the following operational impacts: (1) increasing efficiency; (2) improving organisational processes; and (3) reducing costs (Ramdani et al., 2022). In terms of measurement, established performance metrics widely used in the literature to define what generates revenue today and which projects should be profitable tomorrow include net present value (NPV), internal rate of return (IRR), and return on investment (ROI) (Bosri, 2016). Among these indicators, available evidence suggests that 53% of executives think that the No.1 challenge is quantifying return on investment (ROI) and providing a clear use case, which has been criticised by Mielli and Bulanda (2019, p. 3). A survey from Ernst Young (2019) revealed that at the beginning of 2018, over 70% of Swiss companies saw no reason not to invest in digitalisation, a figure that rose to 80% in 2019. However, the main obstacles that limited them were financial resources, lack of personnel, and lack of know-how.

Therefore, in the times of ongoing digitalisation, the added value of a model capable of measuring the performance of digital projects is appealing to most businesses that lack time to define risk assessments,

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project initiatives, and performance measurements (Mielli & Bulanda, 2019).

Measurement methods are currently in a suboptimal condition, and the problem is still very immature. The measurement issue can be partly attributed to the absence of a measuring standard, which prevents organisations to see how any investment has influenced their profits or losses. However, without a set of quantifiable outcomes, it is impossible to verify whether the technologies were wisely chosen and effectively used (McCann & Barlow, 2015). Furthermore, as argued by Mangiuc (2009), a measurement model enabling users and staff to save time and then can convert time savings into monetary values. Such time and resource savings can serve as a reliable starting point to determine how efficient a digital project is. Along similar lines, Pfister and Lehmann's systematic review (2021b) identified a research gap concerning how a company can measure their business benefit and economic value from digital projects. This is also well aligned with Schweikl and Obermaier's (2022) recommendation for the development of broad performance measurements capable of an effective assessment of firm performance.

Given the contextual background established above, the aim of this research project is to demonstrate how Swiss medium-sized companies can benefit from digitalization by measuring the success of digital projects before starting a digital initiative. By evaluating the current measurement methods, the aim is to present a measurement model for evaluating the performance of digital projects for decision-makers of medium-sized firms in Switzerland informed by the research.

This study employs a participatory research strategy to examine a small sample of experts in the German-speaking part of Switzerland. As such, the study focuses on the following research question (RQ) for the German-speaking part of Switzerland:
How can a measurement model be used to help medium-sized enterprises in Switzerland to examine the performance of digital projects?

In addition, a set of sub-questions (SQ) can be formulated:
(SQ1) What are impacts and challenges of digital projects?
(SQ2) Which performance metrics have to be considered to evaluate digital projects?

To answer the RQ and SQs, the findings from the literature review provided the framework for this research.

2. Literature Study / Hypotheses Development

2.1. Impacts and Challenges of Digital projects

Several reputed scientific databases, including the Taylor & Francis Online, ResearchGate, ScienceDirect, and Emerald, as well as the Google Scholar search engine, were used to collect relevant publications for subsequent literature review. A specific focus was on papers published after the year 2016. However, several older articles were also used if they contained important information about project management, theories, or methodologies. From these articles, those relevant to the research question were reviewed.

Owing to digitalisation, companies can transform networks, change existing business models, and develop extensive opportunities (Bleicher & Stanley, 2019). Overall, the digital transformation trend in different industries pushes companies to re-evaluate their business model. To date, there is a broad consensus among economists that information technology (IT) is one of the most significant factors driving productivity; however, its specific contribution remains unclear (Cao et al., 2016). While IT is broadly acknowledged to be an essential tool, when used alone, it is not always sufficient to improve firm profitability. Instead, it should always be coupled with organizational factors such as an appropriate business strategy (Mithavials & Rust, 2016).

In the last two years of the COVID-19 pandemic, digital projects have received a

massive upwind, as new technologies helped firms to adapt to this unique situation. A recent study concluded that, with the changes caused by the COVID-19 pandemic, SMEs grew more aware of the advantages of digitalisation and of the utility of new business models (Härting et al., 2020). As argued by Ramdani et al. (2022), with the help of digital technologies, SMEs can gain access to new prospects, including improved job market access, enlarged market access, expanded access to funding, improved communication and cooperation, increased product development, and reduced red tape. Indeed, digital technologies are capable of levelling the playing field for SMEs, allowing them to successfully compete with their larger competitors.

The recent increase in the number of digital projects resulted in the growing need to monitor and manage such projects (Almeida et al., 2020; Soto-Acosta, 2020). Thus, in project management, frequent references are made to the famous quote by W. Edwards Deming, one of the influential innovators and thinkers: "You can't manage what you can't measure" (The Deming Institute, 2022).

2.2. Performance Metrics for Digital Projects

Performance measurements are factual data points showing how an organisation performs in relation to predetermined goals and objectives. Several key variables and indicators are the basis for performance measurement and management. These variables and indicators help to quantify facts and present information in aggregated form (Gangadhar & Shaikh, 2021; Kleindienst, 2017). It is important to note that the concept of performance has changed over time (Kleindienst, 2017). Along with efficiency and effectiveness, its two key components, it has come to include other performance characteristics, such as productivity, flexibility, creativity, sustainability, and agility. As a result, measuring performance requires a multi-dimensional approach that would consider both the results of a project, on the one hand, and the operations and processes that led to it, on the other hand. It should also be taken into account that the many performance factors can interact, confronting or supporting each other.

2.2.1. Efficiency and Effectiveness

In Industry 4.0, also known as the Fourth Industrial Revolution, digital solutions will allow companies to achieve higher efficiency; therefore, digitisation can increase companies' effectiveness and efficiency (Müller & Voigt, 2018). The digital shift also allows firms to perform a real-time data analysis of each machine; as a result, the operations team can faster react to a machine malfunction and avoid an interruption in production. Furthermore, with real-time data access, better reports can be created to observe the ongoing business and improve transparency (Horváth & Szabó, 2019). With Big Data, companies can more effectively predict future earnings and forecast customer demand by analysing patterns from a set of large datasets, which translates into better inventory management (Gupta et al., 2020; Matarazzo et al., 2021). In addition, the use of integrated systems, data sharing with suppliers, and automatic machines for packaging helps to better manage the warehouse (Ulas, 2019).

2.2.2. Cost Reduction

Online marketing can reach a sizable number of consumers at a reasonable cost without paying a dedicated marketing channel's high setup and ongoing expenses. As long as customers may examine the goods online and directly contact vendors, intermediary fees can be removed, thus lowering overall transaction costs (Saridakis et al., 2018). Furthermore, process optimisation enables a cost-effective use of resources and reduces operational costs. With corresponding performance measurements, resources may be deployed more wisely and rationally. More precise inventory requirements enable firms to make better internal staffing decisions and improve their supplier management (Sjödin et al., 2018).

2.2.3. Productivity Growth

The advantages of digitalisation outlined in Section 2.2.1 also promote productivity

growth. In this regard, internal firm communication improved with the help of online meetings is vital to save business time and improve teamwork and networking (Ulas, 2019). Online meetings also help to reduce the use of paper and the need for document storage space (Vartolomei & Avasilcai, 2019).

2.2.4. Sales Increase

Sales increase can be measured by implementing and using a Customer-Relationship-Management (CRM) tool, which provides a better understanding of customer needs and future trends for higher sales success (Vial, 2019). Furthermore, sales increase can be achieved through the use of social media, which has been reported to positively influence customer journey and increase customer experience (Matarazzo et al., 2021). To date, substantial evidence is available showing that SMEs are more likely to grow sales if they invest in their social media presence, website, or third-party platforms (Saridakis et al., 2018). Another solution that helps firms to increase sales is Big Data analysis. For instance, Amazon, the industry leader in online retail, is reported to employ sophisticated algorithms to dynamically adjust prices and offer customers relevant products based on predictive computations to boost sales and profit.

2.2.5. Competitive Advantage

Businesses at the front of cutting-edge innovations, the so-called digital frontier, increasingly benefit from their strategies, as digitalisation propels such businesses to new levels of competition where they may raise their revenues (Scott et al., 2017). In this field, Big Data analysis can positively affect firm performance and lead to better decision making and a reduction in total costs so that the firm can offer products at prices lower than those of its competitors (Gupta et al., 2020).

2.2.6. Customer Satisfaction

Marketing departments can better understand and respond to customer needs using integrated marketing methods, such as mobile-, Internet-, omni-channel-, and viral marketing (Ulas, 2019). Likewise, products and services can be improved through automated evaluation of customer feedback (Chen et al., 2016). According to Shetty and Panda (2021), customer satisfaction can also be boosted via increasing investment in cloud-based CRMs where information can be accessed in real time. This allows firms to increase customization of their products and services, and corresponding customer-targeted programs can be established (Horváth & Szabó, 2019).

2.2.7. Innovation Management

Another relevant variable that can positively influence firms' overall success is innovation output (Bouwman et al., 2018). Innovation allows companies to gain a competitive advantage, which benefits business performance. Furthermore, several previous studies found that innovation positively affects the development of business models and firms' long-term success (Bouwman et al., 2018; Cenamor et al., 2019). Finally, with innovative digital technologies, firms can create new products and services (Ramdani et al., 2022).

2.2.8. Cybersecurity

Along with the numerous benefits briefly outlined in previous sections, digitalisation and the corresponding switch from paper to computer have also brought about threats associated with loss or theft of data, which can adversely affect companies' reputation (Vartolomei & Avasilcai, 2019). One way to address the issues related to businesses' cybersecurity includes continuous development of firms' own IT infrastructure and employee training, as risks associated with cybersecurity were reported to frequently arise from people' negligent behaviour (Almeida et al., 2020; Moşteanu, 2020). Another way for SMEs to improve their security includes moving their data into a provider's cloud, thus allowing regular data backup services. In the event of a cyber-attack, data can then be quickly recovered (Shetty & Panda, 2021).

2.2.9. Sustainability

Along with improving operational efficiency, sustainability lowers the factory's environ-

mental impact as compared to that of traditional production methods. In addition, more autonomous processes may reduce the risks of human mistakes, including industrial accidents (Sjödin et al., 2018).

2.2.10. Knowledge Management

One of the barriers for companies on their digitalisation journey is the lack of skilled workforce (Horváth & Szabó, 2019). As noted by Teng et al. (2022), for a successful implementation of digital projects and use of digital tools, well-trained employees are as important as technology.

2.2.11. Employee Satisfaction

One way in which firms can increase their employees' satisfaction is offering opportunities to develop their competencies while working on innovative projects can effectively increase their loyalty and satisfaction (Betchoo, 2016; Oufkir & Kassou, 2019). Indeed, employee satisfaction is largely determined by employees' perception of their career development (Ali & Anwar, 2021). Another critical advantage afforded by digitalisation is that, with online video platforms such as Skype, employees can choose where and when to work in flexible working patterns. Employee satisfaction and dissatisfaction are primarily influenced by the corporate environment and the social dynamics at work. Likewise, Paais and Pattiruhu (2020) states that leadership affects employee performance and satisfaction in a favourable and significant way.

2.2.12. New Markets Access

New markets can be entered by developing new products and services for sizeable target populations. At present, the share of Generation Z, which refers to people born between 1996 and 2013, makes up 25% of the world's population. Generation Z individuals, raised already in the digital age, prefer mobile gadgets, love to act independently, prefer online communication to verbal communication, and subscribe to channels that produce entertaining videos (Ulas, 2019). Along with targeting large customer segments, new country markets can be accessed by using new distribution channels on online platforms (Matarazzo et al., 2021).

2.3. Challenges for Swiss SMEs

The European Union (EU) defines SMEs as firms with fewer than 250 employees (Pfister & Lehmann, 2021b). This definition is well aligned with the one provided by the Federal Statistical Office of Switzerland (2022). SMEs play an important role in the Swiss economy. According to the Swiss Federal Statistical Office (2022), SMEs account for 99% of all businesses. This is supported by the OECD (2022) report, which states that SMEs employed 67.2% of the workforce. In addition Micro enterprises, which are companies with less than 10 employees, accounted for 89.7% of all firms, employing 25.7% of the workforce. Considering that Switzerland is highly ranked nationally for its ability and readiness of its economy to absorb digital technology, digitalisation and the adoption of digital tools are well embedded in innovation and management ideas in the country (IMD, 2020).

However, today's entrepreneurial SMEs in Switzerland find it challenging to compete in highly dynamic situations. In response to competition pressure, many innovative SMEs leverage their business strategy using digitalisation (Cenamor et al., 2019). For instance, a recent survey of 1'539 Swiss SMEs showed that, in order to gain a competitive advantage, their managers had to carefully align their business vision with the digital projects (Kraft et al., 2022).

Yet, one of the challenges associated with digitalisation of Swiss SMEs is its costs. The lack of internal knowledge and skilled employees requires the firm to hire external consultants with expertise in a specific area (Elhusseiny & Crispim, 2022). While these costs can be reduced over time, there is a need for the SME staff training from the externals. These two cost factors—namely, hiring external consultants and staff training—can be very high for a small or medium-sized firm: according to a recent estimate, these two factors can add up to over 70% of an

Enterprise resource planning (ERP) project (Plaza, 2016, p. 176). specialists (Capgemini, 2019; Reim et al., 2022).

Although digital projects can be beneficial for SMEs, managers need to carefully observe associated costs to decide whether or not they should execute such projects. The main barriers to digital projects mentioned in the literature are the lack of financial resources and skilled employees (Elhusseiny & Crispim, 2022).

3. Methodology

This study is inspired by participatory design approach, as also Ballon et al. (2018) demonstrates this approach in the context of digital transformation in SMEs, examining how a digital transformation strategy can strengthen the relationship between network organisations and the generation / regeneration of their business network commons. While their research focuses on network organizations, the collaboration and stakeholder involvement ideas they explore are applicable to the context of this study.

Further, the present study utilised a parallel-iterative approach for the development stage and a mixed-methods design for the evaluation stage. Three focus groups were held with a total of 10 participants, and 5 individual semis-structured interviews were conducted. Guest et al. (2017) highlight that the majority of themes (80-90%) can be discovered within two to three focus groups. Additionally, the concept of data saturation in interview studies suggests that five individual interviews can provide enough information and insights for the research (Francis et al., 2010).

3.1. *Development of the measurement model*

3.1.1. Artefact construction

For the artefact creation, a documentary analysis approach is used to gain insights into the historical and contextual factors related to the research problem. George and Bock (2011) used this approach in their study for business models in practise, therefore the researcher also examined various types of documents and artefacts to draft his own artefact.

3.1.2. Artefact validation

The results of the literature review were used to create the measurement model. Thereafter, three validation interviews with experts in the digitalisation field were conducted to test the measurement model. The selected experts have notable experience in digitalisation. Dr. Paul Pfister, who has extensively studied Digital Value Creation in German SMEs, provided insights into digitalisation issues in the SME sector and helped in drafting a measurement model. Alain Mandy, the chief transformation officer at Wellington Management Funds Global, contributed his experience in the innovation and finance sector to provide a better understanding of the problems of top management. Jan Zollinger, an experienced senior controller, offered valuable input on creating an accessible measurement model and identified key factors for top management, drawing from his experience to offer decision-making bases for the top management.

Overall, validation interviews are used to confirm that an analysis is authentic and has accurately captured the complexity of a topic and that the researchers have adequately guarded against their own biases (Buchbinder, 2010). In this research, we aimed to determine whether the proposed artefact included all crucial parameters for the evaluation interviews with Swiss SME decision-makers.

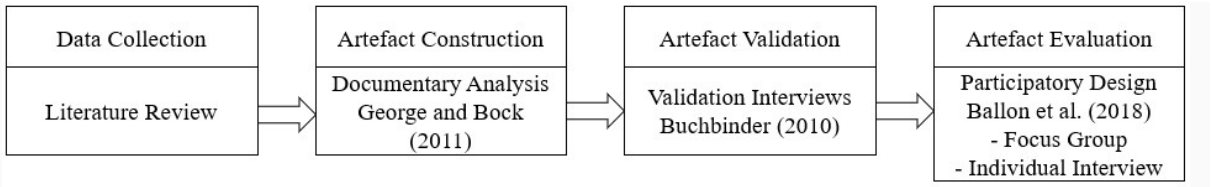


Figure 1.
Research Process. Source; Author's own analysis

3.1.3. Artefact testing

For the artefact testing, Verschuren and Hartog (2005) suggest using semi-structured interviews and then continuously integrating the feedback from the interviews into the artefact and measurement model, thus ensuring iterative enhancement and extension.

3.1.4. *Artefact evaluation*

Ballon et al. (2018) applied the participatory design approach in the context of digital transformation in SMEs, examining how a digital transformation strategy can strengthen the relationship between network organisations and the generation or regeneration of their business network commons. While their research focuses on network organisations, the collaboration and stakeholder involvement ideas they explore are applicable to the context of this study. Focus groups and individual interviews were used to investigate the needs of business decision makers in Swiss SMEs as the target group. Further, iterative feedback loops are encouraged during the participatory design process, as also demonstrated in a study by (Haun et al., 2015).

For the sampling of participants of focus groups, the key informant methodology was used to contact qualified individuals. As can be seen in Table 1 these includes companies' founders, senior managers, product owners, controllers, and CEOs with deep subject-matter knowledge and engaged in digital project decisions within their organisations (Schwadel & Dougherty, 2010). A snowball sampling approach was used to expand the initial sample based on the already existing industry contacts (Naderifar et al., 2017). Specifically, the existing industry contacts were asked to suggest other people, outside of the researcher's network, for further individuals who would be willing to contribute their knowledge to the study. With this technique, three additional interviewees were recruited.

The focus groups and Individual interviews were conducted through Microsoft Teams meetings from November 2022 to December 2022. While the three focus group discussions lasted approximately 70 minutes, the individual interviews lasted around 30 minutes.

To offer all participants the chance to become familiar with the research's objectives, the task description, open questions, and a brief explanation of the study goal were distributed to each participant in advance by email. The questionnaire was devopeled with suitable references and the answers were analysed with the specified codes. The discussions were then recorded and transcribed verbatim to protect against bias, provide a lasting record of the words expressed, and then subjected to qualitative content analysis (Hsieh & Shannon, 2005). After that, we translated the German transcription into English using DeepL.

Table 1.
Overview of interview and focus group participants and companies. Source; Author's own work

Interview type	**Participant functions**	**FTEs**	**Company description**
Individual	CEO	15	The purpose of the company is the design, construction, and maintenance of photovoltaic systems for the use of own electricity and the sale of electricity in Switzerland.
Individual	CFO	47	The company is a Swiss fashion label for organic and sustainable clothing.
Individual	Founder	2	The company is develops an exclusive web application to keep track of individuals' entire crypto wealth. Their launch will be in 3 months.
Individual	Head of Fiduciary & of the Executive Board	50	The company specializes in the consulting of audit, tax, and wealth advisory services, including fiduciary services
Individual	CEO - Finance & Property	240	A family run and privately owned company with 4 hotels in the alpine regions in Switzerland, of which 3 hotels are in the 5-star category and one is 4-star plus.
Focus Group 1	Managing Director	100	The company specializes in wealth advisory services, including fiduciary services.
	Founder	1	The company offers an online course on their education platform to prepare for particular exams.
	Lead Data Scientist	250	The company consults other firms to strengthen their digital transformation from idea generation to market success.
	Product Owner	90	The company offers consulting services, technology, and software products in the finance industry.
Focus Group 2	CEO	14	The company is sells top quality garden furniture from manufacturers and top brands since 1959 in Switzerland.
	CEO	2	The company is a Swiss supplier of sports field and training material supplies. It also distributes golf course and driving range equipment.
	Head of Omni-channel & Sales Support	220	The company sells frozen specialities such as ice cream and vegetables directly to Swiss households.
	CEO	6	The company is is a global joint and is now in the launch phase of their new electric car.
Focus Group 3	CEO	7	The Association represent 270 companies in the building industry and is responsible for their digital transformation
	CTO	232	The company is a leading company in the Swiss energy services market. They focus on the Swiss market for thermal energy and mobility.

3.1.5. Analysis process

A hybrid approach for qualitative thematic content analysis in the process of analysing the transcripts, integrating inductive and deductive approaches was used. This approach is comparable to what Rocchi and Brissaud (2021) employed in their study on Industry 4.0 deployment. They utilised a deductive and inductive strategy in their research to discover the major variables in digital transformation project success or failure. Based on the findings in the literature, they created a questionnaire and utilised a deductive technique to code some questions while using an inductive approach for others. In this study, we followed a similar approach to create the questionnaire based on the findings in the literature and to answer the research sub-questions. Therefore, some sub-questions were coded deductively, utilizing recognized ideas and models from the literature, whereas other sub-questions, were coded inductively, allowing new themes and categories to arise from the data and to answer the remaining research sub-questions.

4. Findings and Discussion

4.1. SQ1 Challenges and benefits over digitalisation

Managers of medium-sized enterprises face challenges around digitalization in terms of improving automation, ERP, and skilled employees. Participant Managing Director stated: "I think one of the key difficulties I saw in both projects to find good project managers and to have like sorts of the ability to really report transparently and take responsibility, ownership and accountable, particularly on the budget side of things". As per the participant CEO of a sports field equipment dealers , the lack of knowledge leads to the inability to implement larger projects like a document management system. A further challenge is the lack of overview of the technologies (as per participant product owner). The lack of time is also an issue for the participant CEO of a manufacturing company of electrical equipment , as they need to prioritise what should be digitised. In the end, the issue is then often postponed. Participant Head of Fiduciary stated in this context that the lack of urgency is a problem, as often older top managers do not want to invest in the future, and he needs to convince them by creating a vision. Further, participant CTO mentioned that one benefits from digitalisation is to achieve the highest possible level of automation so that no human activity is anymore needed. The findings from the interviews and focus group thus reflects the challenges found in the literature that a barrier for digital projects are financial resources, lack of personnel, and lack of know-how (Ernst Young, 2019; Plaza, 2016).

4.2. SQ 2 Designed performance measurement model

Previous research has demonstrated that many of today's SMEs are falling behind in the knowledge on how to measure financial and strategic digital benefits arising from their digital projects (McCann & Barlow, 2015; Mielli & Bulanda, 2019; Schweikl & Obermaier, 2022). This was also expressed in the individual interview by the participant CFO who sees the insufficient measurement of digital projects as one of the weaknesses of her company. Further, the participant Head of Fiduciary did not measure the project directly, they observed an overall financial gain of the company, which could not however be attributed to the effect of just one digital project due to the missing knowledge. To fill this gap in the literature, an artefact was developed based on the literature review and then validated and enhanced based on the insights obtained during three validation interviews with experts in the digitalisation field. The developed artefact consists of the following five components: (1) Definition of the digital project; (2) Investment costs; (3) Financial gains; (4) Financial and strategic gains, and (5) Strategic gains. Furthermore, customized elements have been integrated.

The findings of the study suggest that medium-sized enterprises should evaluate the added value and return of their digital projects by using the measurement model.

4.3. Measurement model

The measurement model contains five components, namely: (1) project type, (2) investment costs, (3) financial gains, (4) financial and strategic gains, and (5) strategic gains. Since digital projects can considerably vary according to the needs of different medium-sized enterprises, the model is built in a modular way so that the managers can insert or delete the parameters wished in the measurement model.

4.3.1. Project type

As can be seen in Figure 2, the first component is the project data entry. It offers the possibility to enter the evaluation date and the company's name. In addition, the project time can be inserted. In the right column, the user specifies the project's name and what kind of digital technology is implemented. As Dr. Paul Pfister mentioned, it is important to identify the problem to be solved and the objectives of the project before selecting the technology.

4.3.2. Investment costs

The second component is the investment costs (see Figure 2). The user of the model has the option to use the predefined investment costs through a drop-down menu, and then suitable cost types are proposed in the second row. However, as Alain Mandy pointed out, it is important to consider the costs carefully before starting a project to avoid wasting money.

Measurement Model for Digital Projects

Date	31.08.2022			Name of the project		DNA 2020	
Name of the Comany	Test AG			Project:		ERP Implementation	
Projekt lenght	01.08.2022 Until	31.12.2022		Type:		SAP	
Investment costs	**Cost type**	**Ranking**	**in**	**Estimation**		**Effective**	**Comments**
Datamigration	Website	Medium	CHF/p.a.	CHF	10'000	CHF 12'000	
Development and Programming	Customizing	High	CHF/p.a.	CHF	5'000	CHF 6'577	
Internal personal c	Change Requests Customizing Total Costs	Low	CHF/p.a.	CHF	1'000	CHF 1'200	
External personal c		Medium	CHF/p.a.	CHF	2'000	CHF 2'300	
Total costs			CHF/p.a.	CHF	18'000	CHF 22'077	
Financial	**Performance Measures**	**Ranking**	**in**	**Estimation**		**Effective**	**Comments**
Cost reduction	Total Saving	Low	CHF/p.a.	CHF	14'000	CHF 15'000	
Efficiency & Effectiveness	Total Profits	Low	CHF/p.a.	CHF	8'000	CHF 9'000	
Total savings and additional revenue			CHF/p.a.	CHF	22'000	CHF 24'000	
Total Profits			CHF/p.a.	CHF	4'000	CHF 1'923	
Return on Investment			**ROI**		22%	9%	

Figure 2.
Measurement Model Component: Project Type; Investment Costs; Financial Gain. Source; Author's Own Analysis

Further, the user can also individually extend investment costs in another sheet of the model (see Figure 4). In addition, Jan Zollinger noted that, based on his experience, there are three quantifiable points to consider: cost, time savings, and quality improvements. This further emphasizes the significance of analyzing investment costs thoroughly. Furthermore, Zollinger emphasized the inclusion of internal personal costs, highlighting their relevance in accurately assessing the total investment required for a digital project.

4.3.3. Financial gains

As Dr. Paul Pfister mentioned, observing the development of revenue or turnover is an important aspect when measuring the financial gain of a project.. Therefore, the third component is the financial gains listed to compute the return on investment of a digital project. In Figure 2, the user can insert the

cost of implementing digital technology and the gain, which makes it possible to compute the return on investment.

4.3.4. Financial and strategic gains

These gains were included in the measurement model to provide users with a range of relevant performance measures. As Dr. Paul Pfister stated, the user should be able to choose these measures based on their specific objectives and priorities. Additionally, the estimation of costs can be incorporated when launching a project. Upon completion, the user can compare the estimated costs with the actual costs incurred, allowing for a comprehensive evaluation of the project's financial performance.

4.3.5. Strategic gains

As Alain Mandy pointed out, some entrepreneurs prioritize factors like employee satisfaction, culture improvement, and risk mitigation over financial gains. Thus, strategic gains were listed as the fourth component of the model. As can be seen in Figure 3 the user selects different strategic gains and the respective performance measures using a drop-down menu. These parameters are different from (4) as these gains do not necessarily lead to a financial gain. Further, Dr. Paul Pfister emphasized the importance of considering strategic gains beyond financials, such as customer and employee satisfaction, competitive advantage, new market access, and innovation management.

Strategic & Financial	Performance Measures	Ranking	in	Estimation	Effective	Comments
Sales increase	Sales growth performance	Medium	%	10%	12%	
Competitive advantage	Market value	High	CHF	CHF 500'000	CHF 510'000	
Sales increase	Average Revenue per User	Low	CHF	CHF 120	CHF 115	
Innovation management	Total of new products and services introduced to the market	Medium	#	1	1	
Strategic	**Performance Measures**	**Ranking**	**in**	**Estimation**	**Effective**	**Comments**
Employee satisfaction	General employees' satisfaction survey	Medium	Text	Level is at 9 out 10	Level is at 7 out 10	
Cyber Security	Rapidity of response to security attacks	Medium	Text	will be reduced to 5 days	is reduced by 7 days	
Knowledge management	Number of employees growth	Medium	#	2	1	
Sustainability	Number of environmental lawsuits	Medium	%	-10%	-10%	

Number of environmental lawsuits
Total energy saving

Measurement Model | Measurement catalogue | Investment costs | Financial | Financial & Strategic | Strategic | Ranking | In | Time 1

Figure 3.
Measurement Model Components: Strategic & Financial Gains; Strategic Gains. Source; Author's Own Analysis

The model is completed by a (a) performance measurements catalogue, (b)the possibility to rank the different parameters from low to medium and high, and (c) customisable parameters.

(a) Performance measurements catalogue

The model includes a sheet entitled "Measurement catalogue" which serves the user as a list and inspiration with different performance measurements and explanations.

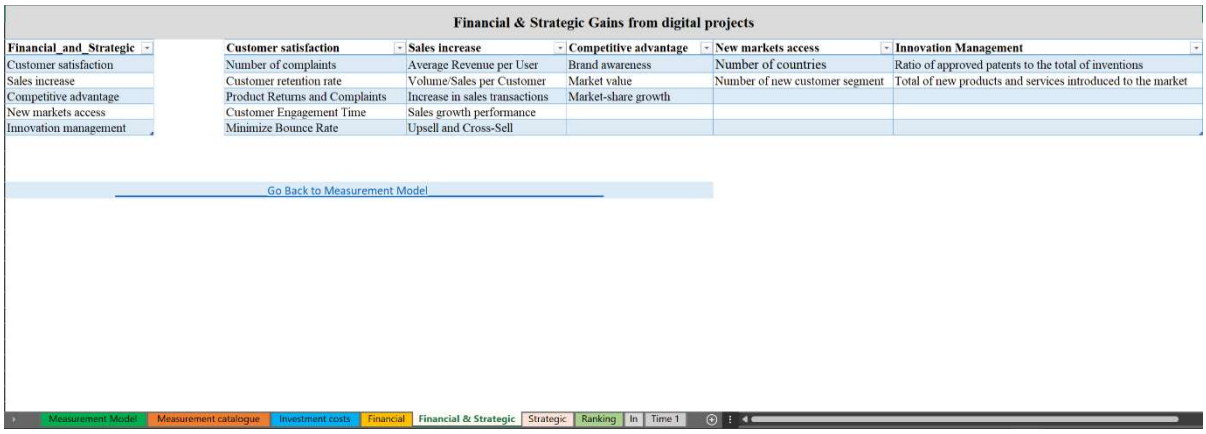
(b) Ranking

As ranking of different performance measurement parameters could be helpful allowing enterprises to better express how relevant a performance measurement is in relation to the overall business strategy, the column "ranking" is included (see Figures 2 and 3). Using this column, the user can evaluate the importance of a parameter (as low, medium, or high) for a specific digital project.

(c) Customisation

While every project is different by its nature, it needs different performance measurements to measure it. For each of the gains, a register is added beside the "Measurement catalogue" in the model so that the manager could easily add more parameters. As can be seen in Figure 4, the user can simply add more parameters

into the model by adding a new row to the desired category. The new performance measurement will then be displayed into the drop-down menu of the measurement model.



Financial & Strategic Gains from digital projects

Financial_and_Strategic	Customer satisfaction	Sales increase	Competitive advantage	New markets access	Innovation Management
Customer satisfaction	Number of complaints	Average Revenue per User	Brand awareness	Number of countries	Ratio of approved patents to the total of inventions
Sales increase	Customer retention rate	Volume/Sales per Customer	Market value	Number of new customer segment	Total of new products and services introduced to the market
Competitive advantage	Product Returns and Complaints	Increase in sales transactions	Market-share growth		
New markets access	Customer Engagement Time	Sales growth performance			
Innovation management	Minimize Bounce Rate	Upsell and Cross-Sell			

Go Back to Measurement Model

Measurement Model | Measurement catalogue | Investment costs | Financial | Financial & Strategic | Strategic | Ranking | In | Time 1

Figure 4.
Register For Additional Parameters. Source; Author's Own Analysis

5. Conclusion

The study aimed to answer the research question, "How can a measurement model be used to help medium-sized enterprises in Switzerland examine the performance of digital projects?"

The findings of the study show, that the studied SMEs face digitalisation challenges in terms of improving automation, ERP, and skilled employees. In addition, the inability to implement larger projects is caused by a lack of knowledge. Another issue is a lack of an overview of current technologies. Time is also an issue, as they must prioritize what should be digitised.

To address this, a measurement model of five components was developed based on a review of the literature and then validated and enhanced based on insights gained during three validation interviews with digitalisation experts. Additionally, customized elements have been incorporated. After the evaluation with 15 SME managers, the study concludes that the proposed measurement model should use the measurement model to assess the added value and return of their digital projects.

5.1. Managerial and theoretical implications

The present study expands SME managers' understanding of how they can measure the success of their digital projects and what performance measurements could be applicable. Along with the measurement model, this study also provides a comprehensive overview of the challenges associated with the implementation of digital projects, such as the lack of financing and a sense of urgency, time constraints, or difficulties associated with finding appropriate employees to perform such projects.

The study contributes to the literature on digital projects, with a particular focus on their quantitative and qualitative performance. The results provide valuable insights into the field of digitalisation of Swiss SMEs and how to analyse the success of them. In response to requests for further study on models and frameworks that simply evaluate the consequences and implications of digitization (Pfister & Lehmann, 2021a; Saridakis et al., 2018), its design gives valuable insights into evaluating digital technology adoption with a measurement model.

5.2. Implementations and Recommendations

One of the advantages of digitalisation is the ability to achieve the highest level of

automation possible, requiring no human intervention. However, many of today's SMEs are falling behind in terms of understanding how to quantify the financial and strategic digital benefits of their digital projects. Therefore, it is recommended that SMEs use the proposed measurement model to assess the added value and return of their digital projects.

5.3. Limitations and Further Research

The present study has several limitations. First, although the pool of the interviewed participants interviewed was large enough for qualitative research, the results cannot be generalised to other populations of SME managers, as the present investigation was in essence a qualitative study (Hennink & Kaiser, 2022). Second, since the present study was based on the key informant methodology, a limitation of the findings is that the interviewed SME managers spoke for their entire organisations, which compromises the reliability of the findings (Schwadel & Dougherty, 2010). Third, the findings reported in this study are limited to the economic context of SMEs in the German-speaking part of Switzerland.

Finally, the findings on the measurement model proposed in the present study are limited to the representation obtained during focus groups and interviews. Accordingly, the model was not tested in the operational handling of the firms.

To address the limitations outlined above, further research is warranted in the following areas. First, for a better generalizability of the results, the proposed measurement model should be tested on a larger sample of SME businesses. Second, to further verify the validity and generalizability of the artefact and to determine which of the mentioned components may be applied to other economies, future research should concentrate on other areas and nations. Third, the model should be tested with different firms in an operational handling where effective past or future projects would be measured.

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