Potentials, Challenges and Success Factors of Innovation Management in German SMEs in the Service and Production Sector

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Abstract

Innovation management is an essential prerequisite for the effective and efficient generation, planning and implementation of ideas and thus for the further development of companies in a dynamic market and competitive environment. In order to investigate the internal innovation potential of production and service companies, this paper examines basic success factors and challenges of innovation management in German small and medium-sized enterprises (SMEs) with a view to the sector to which they belong. On the basis of a questionnaire and interviews with experts, companies were considered with regard to their assessment of their innovative capacity. Based on an analysis of data from 30 participants, we show that the innovation capacity of SMEs with regard to success factors and challenges in manufacturing companies differs significantly from that of service companies. We also find that there is a discrepancy in the assessment of the potential for improvement of success factors and challenges. Our study shows that in the field of German SMEs there is no "best way" to increase innovative capacity, but that it depends on a combination of different factors.

Keywords

Innovation management, idea management, challenges, success factors

1. Introduction

1.1. Significance of the Object of Study

The European Commission (EC) calls SMEs the "engine of the European economy" [12]. Already in 2013, more than 21 million SMEs in the EU provided about 88.8 million jobs. The high importance is also rooted in the German economy, where in 2018 about 2.6 million companies and thus about 31.1 million employees (57% of all employees) worked in SMEs. SMEs can thus be considered the central pillar of the German market economy [34]. In principle, German companies are highly competitive in complex production processes [24]. However, the economic activity environment of German industrial companies is characterized by increasing knowledge intensification, increasingly lower productivity growth and disruptive changes associated with digitalization [24]. The globalization of markets has also greatly increased competitive pressure [20]. This raises the question of how German SMEs can hold their own in global competition.

Cooper and Edgett imply with their statement "innovate or die" that innovations are vital for companies [7]. Consequently, innovation, as an important driver of economic growth [13] and the expansion of companies [20], is essential to boost the weakened productivity growth of German industry and to secure Germany's social prosperity in the long term [24]. It is therefore all the more critical that many companies do not give high priority to increasing their innovative capacity [17]. Furthermore, empirical studies show that the implementation of many innovative ideas fails [1].

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Kriegesmann and Kerka found out that only 13% of all innovative ideas are implemented, of which only 50% are successful [16]. One reason is probably that innovations are fundamentally "uncertain, risky and unpredictable" [8]. The realization of even a few unsuccessful innovations can threaten the existence of SMEs [10], [30]. Consequently, innovations are a risk [8] that companies must nevertheless take in order to secure their competitiveness and generate growth [17]. They are an opportunity and a necessity for SMEs and at the same time a major challenge [1].

1.2. Aims and Structure of the Study

The objective of this study is to identify potentials, challenges and success factors in German SMEs in the service and production sector and to derive recommendations. In order to achieve the desired goal, it is first necessary to analyze the current status of innovation activities in German SMEs. It is necessary to find out which challenges and success factors are of particular relevance to SMEs in order to be able to provide them with targeted recommendations for action and to utilize potentials. However, SMEs differ in many respects, such as their structure, their processes or even their value-added object. While production companies focus on the object to be produced, service companies focus on the activity to be performed. It can be assumed that these companies also differ in their innovation activity due to their different nature. On this basis, the following research questions arise, which are to be answered within the framework of this thesis:

- **RQ1**: What is the development status of innovation activities in German SMEs?
- **RQ2**: What are relevant success factors and challenges for the innovative capacity of SMEs and what potentials can be derived from this?
- **RQ3**: What are the differences between service and production companies?
- **RQ4**: How can IT support the success factors relevant to the innovative capacity of SMEs?

Within the framework of a quantitative survey, findings were collected on the innovation business of SMEs. The results, which emerged on the basis of the quantitative survey, were then supplemented by guided interviews. With the help of these expert interviews, it was determined whether the use of IT systems can support the innovative capacity of these companies. Furthermore, the results were expanded by a systematic literature analysis and made available in aggregated form together with the results from the qualitative and quantitative survey.

2. Methods

2.1. Delimitation of the SME Concept

According to the European Commission, the term SME covers companies that employ fewer than 250 people and have an annual turnover of no more than EUR 50 million and/or an annual balance sheet of no more than EUR 43 million. In addition, the share of a company held by a large company may not reach 25 per cent, which is intended to underline the independence of the group [11].

2.2. Data Acquisition

In order to answer the first research question, a qualitative research methodology was used. In the context of this work, qualitative interviews were conducted and analyzed in accordance with Mayring [19]. In this case, representatives of SMEs that deal with innovations or innovation management were interviewed. With the help of the KOMPASS database Germany, SMEs could be identified and their industry affiliation determined at the same time. As recommended by Berger-Grabner, the subject of the research work was specified as the object of investigation - i.e., innovation management of SMEs [4]. The interview questions were essentially oriented towards Verworn et al. who also conducted questions in the SME sector [33]. The questionnaire includes items from the standard innovation

process according to Thom [31], a self-assessment of the company regarding their strengths and weaknesses in innovation management and finally information on realized innovations of the company. In addition to the qualitative survey, a structured literature analysis and a quantitative survey were conducted. Here we concentrated our analysis on in-house innovation activities. With regard to the literature analysis, a successive procedure was applied. First, the initial findings of "Kaschny et al." [17] were used as a starting point. With the help of initial terms, a first search query was carried out at Scopus and ScienceDirect. In addition, the online catalogue of the University of Rostock served as the data basis.

Subsequently, it was checked which terms lead to relevant results before a further search for keywords in found publications took place. In the course of the literature search, the following final search term was used:

TITLE-ABS-KEY (("innovation" OR "types of innovation" OR "innovation management" OR "idea management" OR "idea"
AND ALL (((adopt*OR implement*)"company suggestion scheme "OR ((adopt*OR implement*)"qualitative content analysis")))
AND (LIMIT-TO (SUBJAREA, „SOCI") OR LIMIT-TO (SUB-JAREA, "BUSI") OR LIMIT-TO (SUBJAREA,"COMP"))
AND PUBYEAR > 2012

A total of 346 sources were reviewed. Of these, 182 were considered relevant and served as the basis for the literature analysis and the creation of a questionnaire (see Fig. 1). The relevance of the literature reviewed was assessed using previously selected criteria. Primarily, literature, not older than 10 years, was included to guarantee its current relevance. Some older sources were only used for the theoretical basis, such as the innovation process according to Thom. Moreover, the focus of the relevant literature was placed on works in the field of innovation management which were mentioned in other sources to guarantee their importance. Thus, the literature by Hauschildt, Vahs/Burmester, Vahs/Brem, Macharzina/Wolf, Dömötör, Schewe/Becker - and especially the Oslo Manual - were highly relevant.

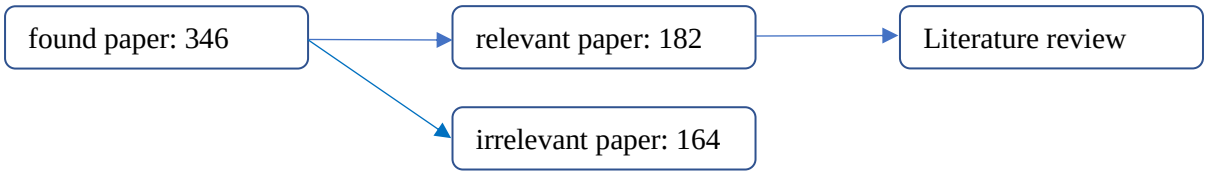

Figure 1: Overview of Data Collection

The empirical study on success factors, challenges and potentials of innovation management in the SME sector was conducted by means of a quantitative survey. The form of investigation used is to be regarded as descriptive. Known success factors and challenges from the literature were empirically tested for their validity in SMEs and defined research questions were answered. By means of a procedure with standardized principles, results should be as comparable as possible [4]. The survey instrument for this study is the written and electronic questionnaire using a semi-standardized questionnaire. The written questionnaire was answered during interview appointments. Subjects who could not attend an interview were interviewed using an electronic version. The population of the sample included executives, innovation managers, employees in marketing, technical design and development, as well as other employees working in SMEs. The sample size was 30 respondents (n=30).

2.3. Data Analysis

The qualitative interviews were evaluated by means of a qualitative content analysis according to Mayring [18], which made the content analysis procedure with the basic form of summary the obvious choice. The aim of the analysis is to reduce the material in such a way that the essential content is

retained, but to create a manageable corpus through abstraction, which is still an image of the basic material. For this purpose, the first step was to form categories. After a proportional processing of the material (10-50%), when almost no more categories could be formed, the category system was revised. A final material passes and a subsequent interpretation and analysis of the collected data took place. The result of the analysis comprises a set of categories on a topic, which are associated with specific text passages [19].

The evaluation of the quantitative survey was univariate. Thus, no interactions between success factors and challenges were examined with or among each other [4]. Within the framework of the survey, several pretests were carried out in which the feedback of the test persons was included and the questionnaire was adapted several times. Reasons were particularly, to examine the response time as well as the understanding of the formulated questions by the respondents. For collecting the data, a Likert scale was used [6].

After a brief introduction to the questionnaire, basic questions were first asked about the company, the importance of innovations and the company's current innovation activities. It is important in this context that innovations are novelties from the company's point of view [1], [14]. In a second section, questions were asked specifically about how innovations are generated in the company, after which they are evaluated and innovation processes are planned and carried out in the company. Finally, the subjects were asked about the strengths or weaknesses of the company's innovation activities.

3. Results

3.1. Status Quo of Innovations in SMEs (Q1)

The current status quo of innovation activities in the SME sector was examined on the basis of expert interviews with 18 companies. Of these companies, three each from the service and production sectors were selected for more detailed analysis. These interviews provide an initial insight into innovation behavior in the service and production sectors.

On the basis of 11 items, the experts were asked about the company innovation processes, as well as the strengths and weaknesses within the innovation process of their companies.

The results of the expert interviews showed that none of the companies surveyed had a well-developed idea management system. The prevailing scarcity of resources in the SME sector can be assumed as the reason for non-institutional innovation management. The innovation process, on the other hand, was increasingly expressed in the form of projects among the respondents in the SME sector. It is striking that most SMEs make little use of concrete methods from theory. Self-developed methods and tools are often applied and given preference over approaches from theory. Only brainstorming, the Kanban method and monthly idea pitches were used by the companies as scientifically based procedures. It turned out that innovation processes in the surveyed companies were not standardized, even if criteria were planned in advance and the innovation process depended strongly on the corresponding problem or other framework conditions, such as the available resources. In the context of idea acceptance, the aspects of feasibility and required know-how and economic efficiency in the form of turnover and cost-benefit analysis are taken into account above all.

3.2. Thematic Background (Q2)

Written and electronic semi-standardized questionnaires were used as a survey instrument to investigate the **success factors**. In addition to the written collection of the questionnaire data, a link to the survey was positioned in social networks and this was also included in the innovation newsletter of the Rostock Chamber of Industry and Commerce.

Only those factors that represent causes for successful innovation were recorded as success factors [14]. The derivation of the success factors was essentially based on the works of Jaberg and Stern [29]. These success factors are presented in Tab. 1.

Table 1
Overview of Success Factors from the Literature

Category:	Success factor:
Leadership	• Management support for innovation [21] • Rewarding innovation activities [29] • Supervisors as teachers [29]
Organization	• Flat hierarchy [14], [29] • Decentralized structures [29] • Fast process flows [29]
Corporate culture	• Open communication [21] • Innovation-friendly climate [25], [31] • Sharing of knowledge [21]
Innovation Team	• Involvement of all corporate divisions [29], [21] • High willingness of employees to innovate [29] • Qualification of employees [17]
Idea generation	• Exploitation of all sources [29] • Application of idea generation methods [5], [32] • Coordination of idea generation / collection [5], [32]
Idea acceptance	• Clear evaluation criteria [26], [32], [15] • Prioritization and derivation of measures [15], [27] • Preparation of financial scenarios [29]
Idea realization	• Flexible project organization [29], [21] • Appropriate resourcing [14] • Use of project management measures [17], [29]

With regard to the **challenges** for the innovative capacity, in contrast to the success factors, these are barriers to innovation, i.e., factors that can lead to a delay, hindrance or even premature termination of innovations or innovation projects [17]. Tab. 2 shows the major challenges for SMEs derived from literature.

Table 2
Overview of challenges from the Literature

Category:	Challenges:
Resources [32], [14]	• Insufficient financial / material resources [1] • Insufficient human resources [1] • Insufficient technical resources [1]
Strategy and methods	• Insufficient planning [17] • Insufficient methodological knowledge [17] • Insufficient early technology identification [14]
Barriers [14]	• Leadership that inhibits innovation [3], [21] • Knowledge barriers [14], [17], [31] • Will barriers [14], [17], [31]

3.3. Success Factor Findings (Q2)

In the course of this work, the success factors and challenges identified in the literature were investigated within the framework of a semi-standardized questionnaire. 11 micro, 14 small and 5 medium-sized enterprises participated in the survey. The areas of the companies include plant engineering, architecture/construction, crafts, trade, real estate, IT, food, market research, medicine, recruitment, production, tax and legal advice, technology, sales and advertising (see Tab. 3).

Table 3
Participating SMEs

Company size	Number of employees	Frequency in the survey
Micro enterprises	until 9	11
Small enterprises	10 - 49	14
Medium-sized enterprise	50 - 249	5

The field of activity of the interviewees was management for 16 subjects. Two others have the role of innovation managers, while one was from marketing and six from technical design and development. In addition, five employees from other positions took part in the survey.

In the course of evaluating the data, the arithmetic mean and the standard deviation of the success factors were calculated on the basis of the absolute frequencies of the Likert scale (5-1). In the course of the data evaluation, the inverted Likert scale was transformed back into an ordinary Likert scale (1-5). The success factors with the highest standard deviation include flexible project organization (σ = 1.19), decentralized structures (σ = 1.12) as well as the rewarding of innovation activities, the inclusion of all company divisions and the exploitation of all sources (σ = 1.10 each). This indicates a disagreement among the respondents regarding these aspects (see Tab. 4).

Table 4
Success factors - Assessment and comparison

Success factor:	SME (total)			Service company		Production company	
	$\bar{x}$	±	R*	$\bar{x}$	R	$\bar{x}$	R
Open communication	1,30	0,53	1	1,31	1	1,25	2
Innovation-friendly climate	1,47	0,68	2	1,46	2	1,50	4
Management support for innovation	1,53	0,78	3	1,62	3	1,00	1
Sharing of knowledge	1,90	0,84	4	1,81	4	2,50	14
Flat hierarchies	2,00	1,07	5	2,00	5	2,00	5
Fast process flows	2,03	0,72	6	2,15	8	1,25	2
Qualification and experience of staff	2,13	0,82	7	2,12	7	2,25	7
Adequate resources for the project	2,14	0,69	8	2,08	6	2,50	14
Involvement of all divisions	2,23	1,10	9	2,23	9	2,25	7
Rewarding of innovation activities by management	2,30	1,10	10	2,29	10	2,33	10
Exploitation of all sources for idea generation	2,37	1,10	11	2,42	12	2,00	5
Coordination of idea generation and collection	2,38	0,98	12	2,38	11	2,33	10
Flexible project organization	2,41	1,19	13	2,42	12	2,33	10
Prioritization of ideas and derivation of measures	2,53	0,97	14	2,46	14	3,00	19

Innovation activity enjoys high priority among employees	2,82	0,67	15	2,79	15	3,00	19
Application of project management measures	2,85	0,95	16	2,88	16	2,67	16
Preparation of financial scenarios	2,96	0,96	17	3,08	17	2,25	7
Clear criteria for evaluating ideas	3,00	1,09	18	3,08	17	2,33	10
Supervisors as teachers	3,07	1,04	19	3,13	19	2,67	16
Decentralized structures	3,09	1,12	20	3,13	19	2,67	16
Application of techniques for idea generation	3,15	1,03	21	3,13	19	3,33	21

*R = Ranking

These factors were rated as not very relevant in terms of their importance. In contrast, the success factors of open communication ($\sigma = 0.53$), high willingness to innovate among employees ($\sigma = 0.67$) and an innovation-friendly climate within the company ($\sigma = 0.68$) had significantly lower standard deviations. Open communication ($\bar{x} = 1.30$) and an innovation-friendly climate ($\bar{x} = 1.47$) were considered particularly significant. Decentralized structures ($\bar{x} = 3.09$) and superiors with a teaching function ($\bar{x} = 3.07$) were rated as factors with a rather subordinate role. In a further step, the findings obtained were assigned to the respondents' assessment of their category. It is clear that corporate culture was rated as being of the highest importance by the respondents. Leadership and organization also had a high relevance (see Tab. 5).

Table 5
Success factors - Categorization with comparison

Category:	SME (total)		Service company		Production company	
	$\bar{x}$	R	$\bar{x}$	R	$\bar{x}$	R
Corporate culture	1,56	1	1,53	1	1,68	1
Leadership	2,30	2	2,35	2	2,00	3
Organization	2,37	3	2,43	4	1,97	2
Innovation Team	2,39	4	2,38	3	2,50	4
Idea realization	2,47	5	2,46	5	3,00	7
Idea generation	2,63	6	2,64	6	2,55	6
Idea acceptance	2,83	7	2,87	7	2,53	5

Furthermore, the respondents were asked open-ended questions about other relevant success factors. The following were identified as additional relevant success factors

- the acceptance of ideas according to customer needs,
- the realization of ideas according to cooperation’s,
- the realization of ideas taking into account the employees' field of activity,
- the innovation experience of the employees,
- and innovation financing.

The speed of innovation, quality requirements, innovative ability, exemplary behavior of managers and public funding were mentioned only occasionally.

Finally, the survey evaluated the potential for improvement with regard to the success factors. The mean value of the potential for improvement was 2.43 and the standard deviation was 0.97. The respondents thus see a relatively high potential for improvement, although there are strong differences between the individual companies.

3.4. Challenges Findings (Q2)

The standard deviation of the factors was also first taken into account when assessing the challenges to innovation activity. Challenges with the highest standard deviations represent barriers to will (σ = 1.39), managers who inhibit innovation (σ = 1.33) and insufficient financial and material resources (σ = 1.27). The lowest standard deviations, on the other hand, are for insufficient technological foresight (σ = 0.88), insufficient technical resources and insufficient planning (σ = 0.98 each). Insufficient human resources ($\bar{x}$ = 2.10) are a particularly significant challenge. Together with insufficient planning ($\bar{x}$ = 2.90), they represent the main obstacle to innovation capacity in SMEs. Insufficient methodological knowledge, inadequate early technology identification and innovation-inhibiting leaders were rated as challenges of lesser importance for innovative capacity (Tab. 6).

Table 6
Challenges - Assessment and comparison

Challenge:	SME (total)			Service company		Production company	
	$\bar{x}$	±	R	$\bar{x}$	R	$\bar{x}$	R
Insufficient human resources (res.)	2,10	1,01	1	1,96	1	3,00	5
Insufficient planning	2,90	0,98	2	3,00	2	2,25	1
Insufficient financial / material res.	3,07	1,27	3	3,13	5	2,75	3
Insufficient technical resources	3,07	0,98	3	3,21	6	2,25	1
Knowledge barriers	3,07	1,22	3	3,08	4	3,00	5
Will barriers	3,07	1,39	3	3,04	3	3,25	7
Insufficient methodical knowledge	3,24	1,06	7	3,32	7	2,75	3
Insufficient early recognition of technology	3,58	0,88	8	3,50	8	4,00	8
Leaders who inhibit innovation	3,68	1,33	9	3,63	9	4,00	8

If individual challenges are assigned to their superordinate categories, it becomes clear that the category "resources" was rated as the most relevant for innovative capacity and thus has a significant influence on the innovative capacity of SMEs (see Tab. 7).

Table 7
Challenges - Categorization with comparison

Category:	SME (total)		Service company		Production company	
	$\bar{x}$	R	$\bar{x}$	R	$\bar{x}$	R
Resources	2,75	1	2,77	1	2,67	1
Strategy and methods	3,24	2	3,27	3	3,00	2
Barriers	3,27	3	3,25	2	3,42	3

Other relevant challenges identified in the questionnaire can be summarized as:

- patentability,
- legal aspects,
- financing of industrial property rights,

the dependency on the ERP system and the associated limitation and the reaction of the customers. In this context, the dependence on ERP systems and the associated limitations and the reaction of the customers are particularly worthy of mention and were given high priority by the respondents.

The average potential based on the challenges is estimated by the respondents at 2.33. The associated standard deviation takes a value of 0.96. Thus, both the values of the arithmetic mean and the standard deviation of the challenges are lower than those of the success factors. Thus, the potential of the innovation challenges is estimated to be higher than the potential of the success factors.

Research question Q2 can therefore be answered by saying that the innovative capacity of small and medium-sized enterprises is primarily shaped by the success factors "open communication", "climate conducive to innovation" and "support for innovation by managers". In relation to the success factors, the corporate culture is also of great importance. Furthermore, they show a high potential for improvement for the innovative capacity of SMEs. With regard to challenges, insufficient human resources and inadequate planning are particularly noteworthy. In this context, insufficient resources show a hurdle or an important reason that prevents innovations in the SME sector. The estimated potential for improvement for the challenges to the innovative capacity of SMEs even exceeds the estimated potential of the success factors.

3.5. Different Preconditions for Innovation (Q3)

Product innovation refers to the introduction of a new or significantly improved product or service into the market [22], [23]. This includes technical specifications, components and materials, software, usability or other functional characteristics [22]. Product innovation can thus result in new knowledge or new technologies, or new application scenarios for existing technology [22].

Service innovation, on the other hand, can differ significantly from innovation in production-oriented sectors, as these are often less formal and technologically organized, as well as more incremental [22]. In the case of services, significant improvements may lie in the way they are delivered, in the addition of new functions or features to existing services, or in the introduction of entirely new services [22]. This type of innovation includes both, innovation of the service as such as well as its environment [9].

The comparison of service companies and production companies is made by means of a comparison of success factors and challenges. While open communication ($\overline{x}$ = 1.31) and an innovation-friendly climate ($\overline{x}$ = 1.46) are of the highest importance for service companies, the factors of support for innovations by superiors ($\overline{x}$ = 1.00), fast processes and also open communication ($\overline{x}$ = 1.25 each) are of the greatest importance in production companies. Although the ranking shows that open communication, an innovation-friendly climate and support from superiors are of essential importance for all sectors, it should be noted that the most important factors for the production companies are open communication, an innovation-friendly climate and support from superiors. It should be added, however, that there is a discrepancy in the assessment of the importance of fast processes, which is significantly more important in the production sector. Both service and manufacturing companies agree that supervisors as teachers, the use of project management measures and decentralized structures play a less relevant role (see Tab. 4).

Taking into account the categories of success factors, it can be seen that corporate culture and leadership play a central role in both service and manufacturing companies. In contrast to the service sector, the manufacturing companies surveyed also place a high importance on the area of organization.

The average estimated potential for improvement of the service companies ($\overline{x}$ = 2.5) is higher than that of the production companies ($\overline{x}$ = 2.0). Accordingly, the respondents from the production companies rate the potential for improvement from the success factors significantly higher (see Tab. 5). With regard to the challenges of innovative capacity, there are clear differences in the ranking between service providers and producers. While insufficient human resources, willpower and knowledge barriers are of high importance in the service sector, they play a rather subordinate role in the production sector, where insufficient technical resources and inadequate planning are the central challenges (see Tab. 6). The respondents from both economic sectors agree on the challenge categories. A lack of resources poses significant challenges for small and medium-sized enterprises. Unsuitable or even lacking strategies, methods and other barriers play a rather subordinate role (see Tab. 7).

With regard to the potential for improvement of the challenges to innovative capacity, both service ($\overline{x}$ = 2.31) and production companies ($\overline{x}$ = 2.50) are at a similar level. How-ever, there is a contrast to

the evaluation of the improvement potential of the success factors, which were rated significantly better by the production companies.

The differences in the innovative capacity of German SMEs between the service sector and the manufacturing sector can be summarized as follows. It becomes clear that success factors and challenges of the innovation capability of SMEs have a different impact on the respective economic sectors. While open communication, an innovation-friendly climate and the support of innovations by superiors are particularly relevant in the service industry, in the manufacturing industry, in addition to open communication, particular value is placed on fast processes. The main challenges in the service sector were insufficient personnel resources, inadequate planning and personnel will barriers. In contrast, the challenges in the production sector were identified as insufficient technical, material and financial resources and inadequate planning. While in the service sector the biggest challenge is insufficient human resources, in the production sector this is reflected in insufficient planning and lack of technical resources. The sectors combine the challenges of lack of resources and insufficient planning, but a differentiated view of the challenges must be taken.

3.6. Supporting Innovation Capability through IT (Q4)

In the following, the possible support of the innovative capacity of SMEs through the use of IT will be examined. For this purpose, detailed findings from other studies are summarized before the results of our own investigation are presented.

The outstanding relevance of IT results from the fact that in today's world a functioning innovation management or idea management without IT support, for example in the form of software, is only conceivable in small companies [28]. Software products basically support, i.e., control and document [28], the entire innovation process from the generation of an idea to its evaluation and realization [17]. Blogs, information systems, wikis, databases, campaigns and idea competitions have been identified as relevant IT support for the innovation process. They take on tasks of communication support, data backup, information dissemination and idea generation (see Tab. 8).

Table 8
IT Deployment

IT deployment	Support from:
Blogs	Open communication and an innovation-friendly climate [34].
Information systems	Information sharing and changing power relations [2]
Wikis	Documentation of knowledge, work processes, manuals and important issues [17], [35]
Databases	Medium- and long-term storage of ideas by means of a computer database [29]
Campaigns, idea competitions	Possibilities for idea generation with high acceptance in the workforce [14]

The survey of the companies made it clear that in-house tools and programs are used, which originate from European Social Fund (ESF) innovation projects and federal innovation projects. In addition, newsletters, portals, blogs, magazines or journals were mentioned. The respondents agreed that IT is useful as a clear support in the innovation process, interpreting the support in different ways. One technology company clearly emphasizes the use of software as IT support for innovation. Other respondents mention concrete measures, such as the use of online shops, bookkeeping and merchandise management systems, which actively save employee’s time. One participant from the field of personnel placement assessed the use of IT as a "co-component" of the innovation process. The focus was on process optimization. The stated goal of the recruitment company is to automate processes in order to

relieve limited personnel resources. A similar picture emerges from the respondent of the mechanical engineering company, which uses an invoicing system to visualize costs and benefits. The interviewees also agree that IT can be used to create clarity of processes and structure. In addition to improved time management, an increase in creativity through the use of IT was also agreed to in principle. When asked about an idea platform, there was unanimous positive feedback and that some of these already exist. Such a platform can be used to manage, comment on, structure and evaluate ideas. In addition, a duplication of ideas can be counteracted in this way.

4. Discussion and Identification of Further Research needs

As with any qualitative analysis, the sample and the sampling procedure must be clear to ensure generalizability. Our study focuses on the innovative capacity of SMEs and uses data from the area of Mecklenburg-Western Pomerania. The results of this work can be generalized to similar business cultures, but should be replicated and quantitatively tested in other cultures and regions to assess whether our results are affected by regional influences or other business cultures. In our work so far, only in-house innovation activities have been studied, leaving out open innovation in the form of collaborations and offering room for further research. Key innovation characteristics, such as time, cost, technical aspects and efficiency, have been ignored in this work. Furthermore, important aspects of innovation management, such as innovation strategy, controlling and financing, were not included and should be considered in further research. In the context of this work, a five-point Likert scale was used. In subsequent studies, consideration should be given to changing this to a seven-point scale in order to obtain more meaningful data.

5. Conclusion

In the course of our work, challenges and success factors for the innovation activity of SMEs in Germany were investigated by means of a qualitative and quantitative analysis. The relevance of the topic becomes all the more apparent when it is taken into account that 31.1 million employees (57 % of all employees) in the European area worked in SMEs in 2018. Through a systematic literature analysis, findings from previous studies could be included and a basis for own findings supported. Key findings of the study show that SMEs face different challenges and success factors in their innovation activities, depending on the sector they belong to. Resources and corporate culture play a central role in both service and manufacturing companies. However, the companies differ on closer examination. While in service company's interpersonal aspects such as open communication, an innovation-friendly innovation climate and personnel resources are of the utmost importance, it becomes clear that in production company's fast processes, the availability of material resources and targeted planning also play a central role. Furthermore, there are differences in the evaluation of potentials with regard to success factors and challenges of the innovation activities of the SMEs involved. The surveys also revealed that knowledge management is of essential importance for the innovative capacity of companies and should be included as an IT instrument.

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