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Requirements and Effects on Companies and Employees of Idea Management Systems in SMEs

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Abstract: For long-term success, companies must adapt to constantly changing political, economic, and technical challenges and customer requirements. Innovations, for example in the area of internal company processes or the products and services offered, contribute greatly to the economic success of companies. Every innovation starts with an idea and more ideas lead to a higher probability of a resulting innovation. To systematically manage a large number of ideas, IT support is necessary. This research addresses the requirements for such an IT-supported idea management system and the effects on the company and employees when it is used. For this purpose, all employees of two companies are involved from the very beginning, from the collection of requirements to the design of a process flow, so that a method and platform are developed jointly.

Keywords: Idea Management; Idea Management System; Product Innovations; Process Innovations.

1 Introduction

Due to rapidly changing markets, an increasing knowledge intensification, and constantly new customer demands, companies must create new or updated products or services to satisfy customer needs. Studies have already shown that companies with a higher focus on innovation are more successful and generate more profits [PK19]. However, such improvement and innovation activities are mainly done in larger companies which have their own Research & Development (R&D) departments. In contrast to this, small and medium-sized enterprises lack engagement in innovation processes [Do14]. Reasons for this are manifold. Lack of structured communication, transparent processes and employee motivation are just some of them [SGC05]. Since 99,3% of the existing enterprises in Germany, which is a total of over 2 million, belong to the group of small and medium-sized enterprises (SMEs) there might be great but unused potential for innovation [Ru19]. To be innovative, problems and improvement potentials must first be identified and then formulated as ideas. Since employees are often closer to the products and processes, they are an important source for new ideas and improvement knowledge. For this reason, in the new working world which also strengthens the role of the individual, bottom-up driven initiatives for idea generation seem to be quite promising since they are more involving and democratic in nature and, above all, lead to more ideas. Having more ideas is crucial, because an increasing number of ideas also means an increasing number of accepted proposals, which also leads to a greater chance for more innovation and can thus give

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companies a competitive advantage [Lä02]. For a systematic management of improvement potentials as well as simple ways of cross-departmental communication, IT-support could be helpful. Among other things, such idea and innovation management systems (IMS) lead to better transparency, increased exchange of information, and improved quality, as several studies suggest [TRP11], [MC11], [EH14]. However, there are still some challenges for companies with regard to suitable idea management processes and the way they are introduced into the company as well as possibilities to counteract a decline in usage after a certain period of time and to reduce the costly and time-consuming pursuit of late rejected ideas.

2 Current Idea Management Process

Employee suggestion systems exist for more than 250 years and the history of idea management in the manufacturing industry goes back to the year 1872 [Th15]. In this year, Alfred Krupp decided to abolish the separation between executive and design activities in companies [VB05]. That gave all employees the opportunity to use their knowledge of products and processes to improve them. Due to political, economic, and technical reasons, the specific configuration of those management systems had to be adapted to the respective conditions. With the progress of technology, complex idea management systems which are accessible for all employees of a company became possible. They are now able to hand in their suggestions and ideas directly with their work computer or even with their mobile phone from home. The possibilities of such systems also allow employees to track the processing status of their ideas, see ideas submitted by their colleagues, or even comment or rate others' ideas. To handle a larger number of submitted ideas in a standardized way and to ensure that all ideas have comparable chances in the evaluation process, process models are needed. In this regard, there are already some different innovation processes mentioned in the literature. An example for this is the innovation lifecycle or the stage gate process which was already devised 30 years ago (cf. Figure 1).

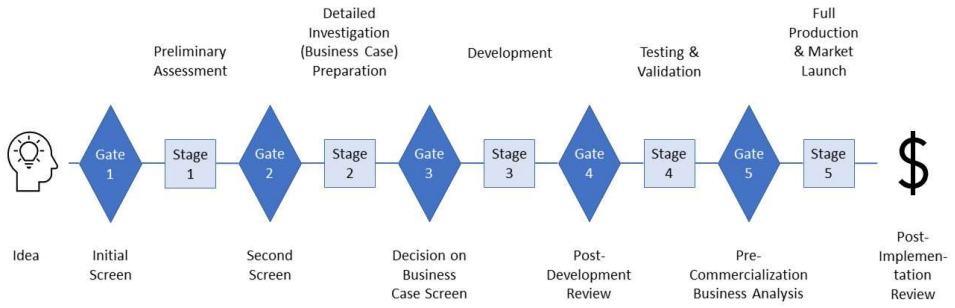

Fig. 1: Stage-Gate Process by Cooper, Robert G., cf. [Co90]

This process consists of different stages in which something has to be done, like an initial screen of an idea, and gates at which someone has to decide whether the idea is rejected or can be further elaborated in the next stage. In the past years, this stage-gate model had been adopted and adjusted multiple times in the context of companies' individual needs. According to this, there are also stage-gate models with fewer or more stages and gates mentioned in the literature but all of them have the activities *idea generation*, respectively *idea submission*, *creation of a business plan*, *development*, *test* and *launch* in common [Co14].

Although most phases of this model (except *idea generation*) are also common in project management, and idea generation is also partly common in continuous improvement initiatives, a separate category of tools has emerged that is dedicated to idea management. Current IMS support many different ideation processes such as employee suggestion scheme, Kaizen, and time-limited innovation campaigns as well as a couple of rating methods with which submitted ideas can be prioritized or rejected [He15]. The part of project management is often implemented only rudimentarily and must therefore be done in separate project management systems. Despite the existing knowledge that ideas are important and that there are necessary IT systems to manage them, some other problems (P) arise. According to Bertelsmann Stiftung studies, it is primarily larger companies that already focus on innovation and often have their own research and development departments [PK19]. One reason for this could be, that managers of SMEs think, that they do not have the capacity for such a large innovation process or are not willing to invest in it and concentrate on their daily businesses since this is how they earn money in the short term (P1). Perhaps they are also hesitating to invest in an IT system because they cannot estimate its value (P2). Even if managers are willing to invest in idea management, they not always have an insight into what such a system would have to look like in their company (P3), also with regard to adjustments that would have to be made due to changing conditions. Once they have overcome this hurdle, they come up against the next problem, the implementation. The introduction of new tools and even a new type of cultural behavior could meet with resistance from some employees (P4). For others, it might be received with interest at first, but after some time the interest might decrease, and people might fall back into old patterns (P5).

3 Research Questions

These mentioned problems lead to various research questions (RQ) in connection with the implementation of idea and innovation management (IIM) in SMEs. One driving question concerns the value of IT in IIM, so that managers can get an impression of whether and to what extent the use of such a system is worthwhile. Another question and its sub-questions concern the requirements of SMEs for such a system. The third RQ deals with the motivation of managers and employees to implement and use an IMS. The complete list of the RQ can be derived from table 1.

RQ#	Research Question	P#
1	What is the value of IT in IIM?	P1, P2
1.1	What effects does IT-supported IIM have on the company and its employees?	P1, P2
1.2	How to identify and reject ideas with low chances of success as early as possible, and only the most promising ones get ahead?	P1, P2
2	Do SMEs have different requirements to IIM than larger companies?	P3
2.1	What adjustments are necessary in IIM due to current phenomena such as Industry 4.0 compared to previous approaches?	P3
2.2	Are there special process models for IIM needed in SMEs?	P3
2.3	Can SMEs be offered best practice processes through checklists and decision trees?	P3
3	How to motivate managers and employees to introduce and use an IMS, not only in the short-term but also in the long-term?	P4, P5

Tbl. 1: Research Questions

4 Methodology

To answer these questions, a method and a platform for idea and innovation management will be developed in partnership with the chair of industrial and organizational psychology, two different SMEs, one from the mechanical engineering and one from the service sector, together with a software development company. Following the goal of involving all employees in the company, participation within the project begins with the collaborative design of the method and platform. In order to gain practical knowledge for RQ2 and its sub-questions, the requirements for an IMS were therefore collected from the two SMEs in a first step. This was done by means of 23 guideline-based interviews with employees from all departments, followed by quantitative questionnaires, which were answered by more than 50% of the employees in both companies. Afterwards, workshops were conducted in both SMEs with 7 and 10 carefully selected employees of different genders, ages, and departments to elaborate jointly an innovation process with responsibilities, necessary data for each process step, and approval as well as rejection conditions. In addition, factors were collected that employees consider important for the long-term success of an IMS. Some of the gathered success factors can easily be transferred into additional requirements or even show the importance of some already included requirements. These results will be handed over to the software development company, which will develop and customize an IMS according to the recorded requirements. In further steps the first finalized version of the IMS will be introduced into the SMEs. After receiving the feedback, further requirements will be identified, the IMS will be adjusted according to them, and the second finalized version will be introduced. The whole process is accompanied by a psychologist who contributes his assessments to the development and assists with the introductions so that the employees become excited

and stay motivated as long as possible. This will help to answer RQ3. During the project he will also examine the effects of the IMS on the company and the employees, so RQ1 and RQ1.1 can be answered. Since the mechanical engineering company has enough employees to be divided into two representative groups, the effects of implementation can be examined there with a test and a control group. An overall analysis of the submitted ideas and their history in the management tool will lead to insights into when and why ideas were rejected, which answers RQ1.2. The determination of relevant characteristics for the creation of innovation portfolios and the classification of ideas into these portfolios can also help to answer this question. This can be used to better examine ideas at an early stage and thus make a rejection recommendation as early as possible.

5 Expected Outcomes

The long-established idea management system has had to be adapted to the changing conditions many times [WIN11]. Despite its importance for long-term success, many SMEs do not practice systematic idea or innovation management where all employees can participate [PK19]. The research project is expected to provide in-depth information for SMEs on how an IT-supported idea management system should be designed and introduced so that it is used in the company on a long-term basis. Furthermore, psychological validated outcomes on effects on both, company and employees, are expected as well as data for managers to better assess the value of such idea management and to support them and the technicians in defining requirements and processes.

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