The role of HRM in participation of work-floor employees in employee-driven innovation through an online suggestion system

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Abstract

Purpose – Since EDI is an understudied concept and it is valuable to involve work-floor employees in the innovation process through EDI, it is interesting to further study the process of EDI. Limited research has been done into the participation of work-floor employees in EDI through an online suggestion system and the role of HRM in it. This is of importance because a common issue of online suggestion systems is employee participation and HRM is concerned with managing employees. Thus, the purpose of this research is to explore how HRM affects the participation of work-floor employees in the EDI process through an online suggestion system.

Design/methodology/approach – This study is based on a multiple case study with four cases. Data was collected on the basis of desk research and 28 semi-structured interviews.

Findings – Remarkably, the HR-department was missing in the EDI process. Work-floor employees did experience HRM activities that generally came from managers. The collected data has resulted in several clusters with the most influential antecedents being 'assessment, annual team target, and monetary reward', 'dependencies', 'supportive supervision', 'getting no feedback', 'intrinsic motivation', 'feeling nothing is done', 'functionalities: high difficulty', and 'having no time'. The degree of participation in EDI through an online suggestion system seems to depend on the employees' experience of the antecedents and mechanisms. This experience has five underlying mechanisms that have both positive and negative sides. These are the following: ability/inability, motivation/demotivation, opportunity/ impossibilities, willingness/unwillingness, expectation/no expectation.

Research limitations/implications – We were not able to obtain much information from the HR-departments because in most cases they were not familiar with the online suggestion system and EDI process. Although we have heard that work-floor employees experience HRM activities from others within the organization, such as managers, it is interesting for future research to study how the HR-department can be involved.

Practical implications – The results of this research provide practical implications for organizations aiming to optimize participation of work-floor employees in EDI through an online suggestion system.

Originality/value – A detailed analysis of how HRM activities contribute to work-floor employee participation in EDI through an online suggestion system. This follows in a conceptual model with the relationships found.

Keywords Work-floor employee participation, Employee-driven innovation, Online suggestion system, Continuous improvement, Human Resource Management

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1. Introduction

Innovation has become an important source to enhance organizational performance, success and long-term survival (Anderson, Potočnik, & Zhou, 2014; Damanpour, 1991). Innovation is defined as the generation, development, and implementation of new ideas (Damanpour, 1991), which contribute to increasing the ability to rapidly react to economic changes and to gain competitive advantage (Bos-Nehles, Renkema, & Janssen, 2017). It does not matter whether the idea has already been adopted within another organization. If the idea is new for the adopting organization, it is an innovation (Damanpour, 1991). The two fundamental criteria of innovation are newness and value (Høyrup, 2010). The innovation has to create economic value for the adopting organization. Research has primarily focused on innovation created by experts (R&D-based innovation), user-driven innovation and technological innovation (Anderson et al., 2014; Høyrup, 2010). Nevertheless, the innovativeness of work-floor employees is an important perspective (Gong, Zhou, & Gang, 2013; Høyrup, 2010; Kesting & Ulhøi, 2010). Individuals come up with new ideas, thus they play a vital role. West and Farr (1989) described the idea of innovative behavior of employees. Following this, Scott and Bruce (1994) studied the factors that could stimulate innovative behavior of employees. Subsequently, Janssen (2000) developed the concept of innovative work behavior (IWB). IWB is defined as "the intentional creation, introduction and application of new ideas within a work role, group or organization, in order to benefit role performance, the group, or the organization" (Janssen, 2000, p. 288).

Innovation can be seen as the outcome of the employee-driven innovation process, where IWB is the input (Renkema, 2018). Høyrup (2010) was the first to conceptualize employee-driven innovation (EDI). EDI is a relatively new form of innovation which is understudied and often unnoticed. Employee-driven innovation is characterized by non-technical, non-R&D and high-involvement innovation (Høyrup, 2010). In other words, employee-driven innovation refers to the generation and implementation of ideas by employees from the work-floor where innovation is not part of the compulsory activities (Renkema, Meijerink, & Bondarouk, 2021). Renkema et al. (2021) examine the ways in which HRM contributes to the emergence of individual ideas and their translation to organizational-level innovation performance. They found that HR-practices facilitate the emergence of EDI focusing both on the content and process. It is important to distinguish within HRM policy domains. Some HR-practices are more appropriate to the generation of ideas and some to the implementation (Renkema et al., 2021). Because EDI is an understudied topic and the appropriation of HR-practices depends on different phases of the process, this paper will investigate the link between HRM and EDI, keeping in mind different phases.

The involvement of employees from the work-floor in the innovation process is becoming more valuable (Buech, Michel, & Sonntag, 2010). Continuous improvement is to the utmost extent dependent on the suggestions of employees (Frese et al., 1999). A method that organizations use to involve work-floor employees into the innovation process is via a suggestion system (Buech et al., 2010; Fairbank &

Williams, 2001; Frese et al., 1999; Van den Ende, Frederiksen, & Prencipe, 2015). Ekvall (1971) defined a suggestion system as an administrative procedure for collecting, judging, and compensating ideas of employees. Since the ideas in a suggestion system originate from work-floor employees outside innovation units, the innovation process through a suggestion system can be seen as a form of EDI. Many studies have shown the positive contribution of suggestion systems to organizational success (Du Plessis, 2016; Fairbank & Williams, 2001; Van Dijk & Van den Ende, 2002). For example, Du Plessis (2016) illustrates that greater employee participation leads to greater tangible benefits such as cost saving and higher sales and intangible benefits such as higher levels of morale. He concludes that a suggestion system is a perfect tool for HRM and managers on their road to success.

As HRM is concerned with managing employees within organizations (De Leede & Looise, 2005) it has a role in motivating employees to participation in the online suggestion system. Researchers examined the contribution of HRM to innovation (e.g., Bos-Nehles et al., 2017; Jiménez-Jiménez & Sanz-Valle, 2008; Seeck & Diehl, 2017; Shipton, West, Dawson, Birdi, & Patterson, 2006; Veenendaal & Bondarouk, 2015). Several studies show that HRM enhances innovation (Jiménez-Jiménez & Sanz-Valle, 2008; Seeck & Diehl, 2017; Shipton et al., 2006). In case of IWB, Bos-Nehles et al. (2017) and Veenendaal & Bondarouk (2015) underline HR-practices that enhance IWB. HR-practices can also have a negative effect on innovation (Fernandez & Moldogaziev, 2012; Bos-Nehles et al., 2017). For instance, rewards inhibit IWB when they are based on performance (Fernandez & Moldogaziev, 2012). The paper by Malhotra, Majchrzak, Bonfield and Myers (2019) examined how work-floor employees can contribute to the innovation process. They state that HRM is of importance to enable employees to participate in the innovation process. Therefore, they outline several HRM actions that can be undertaken to mitigate the challenges of engaging front-line employees in the innovation process (Malhotra et al., 2019). More studies have been concerned with factors affecting participation in suggestion systems (e.g., Buech et al., 2010; Fairbank & Williams, 2001; Frese et al., 1999). For example, Frese et al. (1999) studied the predictors of making suggestions in a well-organized suggestion system. They concluded that active people who feel that their submission is threated seriously, believe in their own competence and really see a problem submit suggestions (Frese et al., 1999). Furthermore, Fairbank and Williams (2001) point out that employees who believe they are competent, are instrumental in obtaining positive personal outcomes, and are expecting the performance to be rewarding will be strongly motivated to think creatively and to participate in a suggestion system. Moreover, Buech et al. (2010) illustrated that the positive attitude of an employee towards the suggestion system mediates the positive relationship between interactional justice and motivation to submit suggestions when wellbeing was high or moderate, not when wellbeing was low. Altogether, there are several factors affecting participation in a suggestion system. Malhotra et al. (2019) describe that further research is needed in the area of employee participation systems because many employees tend not to participate and express themselves in these systems. If employees do not participate, ideas remain unused and opportunities to improve the organization are lost. Fairbanks and Williams (2001) state that

lack of motivation of employees to participate is a common weakness of suggestion systems. In short, it can be stated that HRM and innovation are strongly associated with each other. HRM usually has a positive effect on innovation, but this can also be negative. Since employee participation is a common problem in EDI through an online suggestion system, it makes sense to explore the role of HRM in participation of work-floor employees in EDI through an online suggestion system.

Since EDI is an understudied concept (Admunsen, Aasen, Gressgård, & Hansen, 2014; Høyrup, 2010) and the engagement of employees on the work-floor in the innovation process is becoming more important for organizational success (Buech et al., 2010; Fairbank & Williams, 2001; Van Dijk & Van den Ende, 2002), it is of utmost interest to further study the process of EDI. Specifically, more research is necessary into the factors that stimulate employees to participate in suggestion systems (Malhotra et al., 2019). Moreover, studies on the role of HRM in facilitating or inhibiting participation in EDI through an online suggestion system seem absent. A better integration of HRM in this literature is important, given that a key activity of HRM is to motivate employees, and studies have shown that HRM can have a positive effect on innovation (Seeck & Diehl, 2017; Shipton et al., 2006). Therefore, the goal of this research is to explore the effects of HRM on the participation of work-floor employees in the innovation process through an online suggestion system. Based on the goal, the following research question is formulated: *'How can HRM activities facilitate/inhibit participation of work-floor employees in innovation through a (online) suggestion system?'*. The research question was answered based on a qualitative research approach.

This study contributes to existing literature in five ways. First, the role of HRM in EDI through an online suggestion system was examined. We showed that the role of the HR-department was missing. However, work-floor employees experienced HRM activities from others within the organization. Second, explanations were found for the restrained participation of work-floor employees in an online suggestion system. It seems that foremost contextual factors (i.e., accessibility and functionalities) pre-determine the use of the online suggestion system. Therefore, organizations should facilitate an environment in which the online suggestion system is easy to comprehend and handle. Third, HRM activities seem contingent on each other, and no best practice is found. In this way, different HRM activities might carry the same effect. Fourth, this study contributes to literature by showing that the AMO-model can also have a reverse working. It appears that when work-floor employees experience inability, demotivation, and impossibilities this will inhibit their participation in EDI. Next to these mechanisms, this study uncovered two other mechanisms with both a positive and negative side. These are the degree of experiencing an expectation and the degree of willingness of employees. Lastly, this study revealed that managers are having a key role within participation in EDI through an online suggestion system. Managers can influence the level of employee participation through encouragement and support. In addition, they also have a determining role in, for example, determining whether an idea is implemented.

2. Theoretical foundation

This chapter represents the theoretical foundation, which allows us to propose the conceptual model at the end of the chapter. First, we will shortly discuss innovation and its definition. Second, innovation (i.e., innovative work behavior and employee-driven innovation) and the relationship to HRM will be elaborated. Lastly, literature on the three main concepts of this study, namely HRM, employee-driven innovation, and (online) suggestion systems, will be described. Section 2.2 till 2.4 include a table summarizing the literature with independent and dependent variables.

2.1. Innovation

Innovation is a multidimensional concept, which can be observed from different perspectives. Nevertheless, it seems that researchers agree on the core of the concept. The initial definition of innovation, given by Schumpeter in 1934, is that innovation is novelty that creates economic value (Schumpeter, 1934). This definition is often taken as the basis. Høyrup (2010) mentions that newness and economic value are the two fundamental criteria of innovation. The adoption of innovation is in general intended to increase organizational performance (Damanpour, 1991). Damanpour and Evan (1984) specified the definition of innovation as the adoption of an internally generated or purchased device, system, policy, program, process, product, or service that is new to the adopting organization. It can be deduced from this definition that innovations can be different kind of things for every organization. West and Farr (1989) proposed a corresponding definition. They defined innovation as "the intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit role performance, the group, the organization or the wider society" (West & Farr, 1989, p. 16). The aforementioned definition is a generally accepted definition of innovation. Therefore, this study adopts that definition.

2.2. HRM and innovative work behavior

Multiple studies have shown that HRM can contribute to innovation (e.g., Jiménez-Jiménez & Sanz-Valle, 2008; Seeck & Diehl, 2016; Shipton et al., 2006). At the individual level HRM can support innovative behavior of employees (Bos-Nehles et al., 2017) and at the organizational level HRM is able to stimulate innovative performance (Seeck & Diehl, 2016). However, HRM can also inhibit innovation (Fernandez & Moldogaziev, 2012; Bos-Nehles et al., 2017). HRM can be defined as the management decisions and activities that affect the relationship between the organization and its employees. Hence, the human resources (Beer et al., as cited in De Leede & Looise, 2005). Considering HRM and innovation, IWB of employees is mostly studied (Renkema et al., 2021). IWB refers to individual behaviors of employees concentrated on "the intentional creation, introduction, and application of new ideas within a work role, group, or organization, in order to benefit role performance, the group or the organization" (Janssen, 2000, p. 288). The process of IWB can be divided in three dimensions, namely idea generation, idea promotion, and idea realization (Scott & Bruce, 1994). Idea generation is the

dimension where employees identify problems and opportunities and consequently generate new ideas (Veenendaal & Bondarouk, 2015). The following dimension is idea promotion (or idea championing). In this phase the idea is promoted throughout the organization to find support for further development (Janssen, 2000; Veenendaal & Bondarouk, 2015). Finally, the dimension of idea realization (or idea application) consists of incorporating the new ideas into the organization and realizing those ideas that can be experienced and applied (Janssen, 2000). Idea promotion and idea realization are often together labelled as implementation (Veenendaal & Bondarouk, 2015). To conclude, it is shown that HRM contributes to innovation.

There are several HR-practices that can affect IWB. Veenendaal and Bondarouk (2015) conducted research into the effect of perceptions of four high-commitment HR-practices (supportive supervision, training and development, information sharing, and compensation) on idea generation, idea promotion, and idea realization. They concluded that all four HR practices have a positive effect on all dimensions of IWB. The most advantageous HR-practice seems to be supportive supervision. Bos-Nehles et al. (2017) studied HR-practices affecting IWB. They also found that training and development, and reward have a positive effect on IWB. However, when rewards are based on performance, they can inhibit IWB (Fernandez & Moldogaziev, 2012). Bos-Nehles et al. (2017) found that intrinsically motivated employees would reduce their engagement in IWB if the organization would present motivating-enhancing HR-practices such as rewards or job security. Furthermore, autonomy, task composition, job demand and feedback were also found to have an increasing effect on IWB. IWB is a behavioral concept which does not explain how an innovation is developed at implemented at the organizational level. The underlying assumption is that a greater IWB leads to more ideas developed and implemented at the organizational level (Renkema et al., 2021). Bos-Nehles et al. (2018) and Veenendaal and Bondarouk (2015) have indicated that innovative behavior of employees has a positive effect on organizational performance. Renkema et al. (2021) have introduced the concept of EDI to HRM literature to connect IWB with innovative outcomes at two levels of analysis, i.e., individual level and organizational level. In the following paragraph, the concept of EDI will be elaborated.

Table 1: Literature summary HRM and IWB.

Authors	Independent variable	Dependent variable (effect)
Veenendaal & Bondarouk (2015)	Supportive supervision, training and development, information sharing, compensation	IWB (positive)
Bos-Nehles et al., (2017)	Training and development, reward, autonomy, task composition, job demand, and feedback	IWB (positive)
	Rewards, job security for intrinsically motivated employees	IWB (inhibiting)
Fernandez & Moldogaziev (2012)	Rewards based on performance	IWB (inhibiting)

2.3. HRM and employee-driven innovation

Involving employees in innovation is getting more important now the economy is rapidly changing (Buech et al., 2010). A useful tool to gain competitive advantage by utilizing the capacities of employees is employee-driven innovation (Kesting & Ulhøi, 2010). Høyrup (2010) was the first to conceptualize employee-driven innovation (EDI). EDI can be compared with non-R&D innovation, non-technological innovation, high-involvement innovation and direct participation in organizational change. The main characteristic of EDI is high involvement of employees who are not required to innovate. Hence, innovation is driven by employees' resources, namely: ideas, creativity, competence and problem-solving abilities (Høyrup, 2010). Høyrup (as cited in Renkema, 2018) discussed three orders of EDI where the difference is whether innovation is bottom-up or top-down. EDI can be truly bottom-up, top-down, or a combination of both. Following Høyrup (2010) and Kesting and Ulhøi (2010), Renkema et al. (2021) defined EDI as "the generation and implementation across organizational levels of new ideas, products, services, and/or processes originating from one or more work-floor employees who are not overtly required to be active in these activities" (p. 7). The definition of EDI is closely related to IWB. Renkema et al. (2021) state that innovation is the outcome of the EDI process and IWB provides the input of the EDI process. Thus, EDI explains the process of going from IWB to an implemented innovation at the organizational level. The concept links the individual perspective and organizational perspective. Therefore, it discloses employee behavior from a multilevel perspective.

There are different characteristics involved in EDI emergence. Considering the content perspective of employee-driven innovation, it can include any content. Different kinds of content are for example product, process, business, culture, market, organization, and technology. However, new knowledge, change in routines and organizational innovation are the most common employee-driven innovations (Høyrup, 2010). EDIs can be radical or incremental (Høyrup, 2010). Although, some researchers describe that the nature of EDI is mostly incremental (Aaltonen & Hytti, 2014). In the study of Renkema et al. (2021) most innovative ideas concerned process improvements. Next to the content perspective there are two other features of EDI emergence: structure and process (Renkema et al., 2021). The structure refers to higher-level contextual factors that shape the process. For example, HR-practices and formalization. Moreover, the process is related to the interaction and coordination of an individual idea towards an implemented idea. This process can emerge through different organizational routes (Renkema et al., 2021). In the first route, 'organizational route', employees share their ideas with colleagues and direct managers and later the idea will be discussed with the department heads. In most cases the managers take over the responsibility. The second route, 'formalized system route', includes employees by encouraging them to share problems and ideas through an online system which is formalized. Moreover, employees are able to keep track of the development of the idea and receive feedback. Again, managers have a crucial role, as they have to assess the suggestion. In the third route, 'project-initiative route', employees are included in project teams with a clear purpose. Employees who are not directly included in a team are still able to share their ideas for improvement (Renkema et al.,

2021). The process of EDI is primary a bottom-up process. Even though, it seems that organizations need to support, recognize and organize the process (Høyrup, 2010). Since this study is focusing on online suggestion system, the second route 'formalized system route' will be our main focus.

There seems to be no general consensus regarding the phases of EDI in EDI literature. Renkema et al. (2021) developed phase-model outlining five phases. In all phases, employees play a different role. The first phase is the 'emergence phase'. In this phase new ideas emerge from problem and opportunity recognition. The second phase the 'development phase', consists of employees finding solutions for the emerged and generated ideas. In the 'communication phase' employees are discussing the idea with direct colleagues and leaders and get initial feedback. The fourth phase – 'establishment phase' – consists of involving others with the idea, developing the idea further, testing, and convincing others. The final phase is the 'implementation phase', where ideas worth implementing are being put into practice (Renkema et al., 2021). Moreover, Gressgård, Amundsen, Aasen, and Hansen (2014) divided the EDI process into four phases, namely 'idea generation phase', 'selection phase', 'development phase', and 'implementation phase'. Other scholars divided the process into idea generation and idea implementation (Axtell et al., 2000). Based on these findings, our study focuses mainly on a combination of these different approaches and the phases described in IWB literature. Hence, we adopted the following phases: idea generation, idea development and idea implementation.

According to Amundsen et al. (2014) the most comprehensive literature review about EDI-practices was performed by Smith, Kesting and Ulhøi. Smith et al. (as cited in Amundsen et al., 2014) found four main factors that influence the potentiality of EDI, namely leader support, autonomy, cooperation and innovation climate. Whereas leader support can be seen as the most important factor for EDI. Notably, Bos-Nehles et al. (2017) concluded that supportive supervision is the most beneficial HR-practice for IWB. Hence, it seems that leader support is important for both EDI and IWB. Moreover, Amundsen et al. (2014) state that they were unable to select a 'best practice' for EDI. They suggest that EDI can be implemented and performed in many ways that all enhance innovation capacity. However, there are three interrelated domains: (1) performance of specific organizational roles (e.g., leaders and employees), (2) recognition of particular cultural characteristics that encourage employees to participate and (3) use of specific tools to facilitate EDI. They found that the organizations that use the most practices for EDI achieve the best results. An important starting point for getting the best result from EDI is to integrate it as part of the daily work. Furthermore, EDI should not be based on voluntariness or imposed on top of current tasks (Admunsen et al., 2014). In short, there does not seem to be a best way to set up EDI. Although it is important to include EDI in daily work and not as an extra task.

To date, EDI has not explicitly been studied in the context of a suggestion systems. However, a number of researchers did make the link between EDI and digital tools. Backström and Lindberg (2019) and Gressgård, Amundsen, Aasen, and Hansen (2014) studied EDI through digital technology. The latter examined how organizations use web-based tools in their EDI process. Results illustrate that web-based tools can support important aspect of EDI, such as the process of acquisition and exploitation of

knowledge. However, the web-based tool has to be in line with organizational structure to gain success. Backström and Lindberg (2019) conducted research into the mechanisms behind varying involvement in digitally enhanced EDI. In line with general EDI literature (e.g., Admunsen et al., 2014), Gressgård et al. (2014) and Backström and Lindberg (2019) concluded that online tools in EDI need to be well integrated into daily work routines and tasks to ensure involvement of employees. Furthermore, managers should constantly encourage persistence and tolerance, with a long-term perspective on success. Since employees are the main source of innovation in EDI, managers should build employees' self-confidence and satisfaction (Backström & Lindberg, 2019). Hence, web-based tools are potentially beneficial tools to invite employees into the innovation process. An online suggestion system is an example of such a web-based tool. For that reason, this study focuses on EDI through online suggestion systems. The following paragraph describes the suggestion system literature and elaborates on studies that already link HRM and suggestion systems, and EDI and suggestion systems.

Table 2: Literature summary HRM and EDI.

Authors	Independent variable	Dependent variable (effect)
Smith et al. (as cited in Amundsen et al., 2014)	Leader support, autonomy, cooperation, and innovation climate	EDI (stimulating)
Amundsen et al. (2014)	Performance of specific organizational roles, recognition of cultural characteristics that encourage employees to participate, use of specific tools to facilitate EDI	Innovation capacity (enhancing)
Backström & Lindberg (2019)	Web-based tool (condition: integrated with organizational structure)	EDI (supporting)
	Managerial encouragement and support on self-confidence and satisfaction	Employee involvement (supporting)
Gressgård et al. (2014)	Online tools well integrated into daily routines	Employee involvement (facilitating)

2.4. Suggestion systems, HRM and employee-driven innovation

Suggestion systems play a pivotal role for organizations wanting to become more innovative (Buech et al., 2010). Because of the need for organizations to continuously improve and adapt to ever-changing and complex environments, effective employee systems are of great importance (Fairbank & Williams, 2001). Suggestions of employees are a huge contribution to continuous improvement of organizations (Frese et al., 1999). Via a suggestion system, employees get the opportunity to submit an idea and to receive feedback for it (Fairbank & Williams, 2001). Ekvall (1971) defines a suggestion system as an administrative procedure for collecting, judging and compensating ideas of employees. Even though suggestion systems are often used online nowadays (Lasardo et al., 2016), this definition is still used. Du Plessis (2016) state that a suggestion system "consists of a formal procedure that encourages employees to think innovatively and creatively about their work and work environment, and to produce ideas." (p. 35). While it is the most under-valued management tool available, it can lead to greater

employee involvement. Which in turn can lead to greater tangible benefits (e.g., cost savings, better sales) and greater intangible benefits (e.g., higher levels of morale) (Du Plessis, Marx, & Wilson, 2008). As such, HRM can play a role to optimize the usage of these online suggestion systems.

Suggestion system literature has been linked to HRM literature. According to Du Plessis (2016), HRM and line managers will always have a pivotal role in the success of a suggestion system. Moreover, a suggestion system itself can be seen as an HRM tool. The HR-department and line managers have to provide support to employees to participate in a suggestion system. For example, by motivating employees with recognizing potential ideas and rewarding those (Du Plessis et al., 2008; Du Plessis, 2016). In addition, Malhotra et al. (2019) describe HRM activities as important enablers for employees to participate in the innovation process. To achieve organizational success with a suggestion system, management must be involved in the process by creating opportunities for employees to submit their ideas, get those ideas properly evaluated, give recognition when it is due and implement them as soon as possible (Du Plessis, 2016). Incentives are important for employees to feel that the submissions of their usable ideas will be rewarded (Du Plessis et al., 2008). The feedback on non-implemented suggestions can keep employees motivated toward the system (Buech et al., 2010; Du Plessis et al., 2008; Fairbank & Williams, 2001; Van Dijk & Van den Ende, 2002). Moreover, providing feedback to employees on their ideas should demonstrate that the system is well run, thus facilitating participation. To conclude, it can be extracted that the experience of an employee with the system plays a big role in participating with it.

Research on online suggestion systems suggests that there are several factors that can contribute to the success and employee involvement of the suggestion system. The generation of ideas depends more upon individual characteristics. Scholars describe that employees who are active, feel taken seriously and do not have the feeling they are hindered by their situation in the organization are most likely to submit suggestions. Furthermore, they have a high degree of perceived competence and autonomy (Axtell et al., 2000; Frese et al., 1999). In line, Fairbank and Williams (2001) conclude that employees are more motivated to participate (1) when they believe in their ability to successfully perform, (2) when they believe that their performance ensures positive personal outcomes, and (3) when expect the performance to be rewarding. Moreover, there are some organizational factors affecting the generation of ideas. A participative environment does encourage participation in generating ideas (Axtell et al., 2000). On the other hand, organizational barriers influence the decision to write and submit an idea. The degree of control and complexity, also known as job content, seems to be negatively related to the generation of ideas (Frese et al., 1999). So, when the work of employees has a high degree of control and complexity, the generation of ideas is lower. Furthermore, the generation of ideas seems to have a positive effect on the implementation of ideas. Axtell et al. (2000) report that if employees make a lot of suggestions, the opportunity for those ideas to get implemented is greater when employees receive support. Organizational support is stated by several researchers as a contributor to the innovation process (e.g., Axtell et al., 2000; Frese et al., 1999; Lasardo et al., 2016; Van Dijk & Van den Ende,

2002). The organizational support could be (partly) offered by the HR-department. However, scholars seem to disagree about which phase organizational support applies to. According to Van Dijk and Van den Ende (2002) encouragement of employees is important in the phase of 'idea extraction', organizational support plays a role in the 'idea landing' and committed resources are crucial for 'idea follow-up'. In contrast, Lasardo et al. (2016) state that committed resources are required through the whole process. Conditions where employees are allowed and encouraged to develop new ideas and participate in decisions are most likely to facilitate the actual implementation of ideas. Buech et al. (2010) found a positive relationship between 'the relationship between employees and the suggestion system' (also called interactional justice) and the motivation to submit suggestions, which was partially mediated by the positive attitude of an employee towards the suggestion system and the advantages of the system (also called valance of the suggestion system [VSS]). Furthermore, wellbeing seems to have a moderating effect on the positive relationship between VSS and motivation to submit suggestions. Lastly, interactional justice has an indirect effect on motivation to submit suggestions through VSS when levels of wellbeing are moderate or high, but not when wellbeing is low (Buech et al., 2010).

While these individual and organizational factors are important for understanding the participation of work-floor employees in online suggestion systems, only limited attention has been paid to what HRM activities can be deployed to stimulate the participation. As HRM plays an important role in managing employees (De Leede & Looise, 2005), HRM activities may contribute to participation in the different phases of EDI through an online suggestion system. For example, Malhotra et al. (2019) showed that HRM activities are important enablers for employees to participate in suggestion systems. How and why work-floor employees contribute to these systems may therefore be contingent upon HRM activities. Considering the interplay between HRM activities, the phases of EDI and the use of online suggestion systems is therefore crucial to gain a better understanding about how and why employees will participate in EDI processes. Therefore, the conceptual model, which is explained in the following paragraph, will include those broad concepts.

Table 3: Literature summary suggestion system, HRM and EDI.

Authors	Independent variable	Dependent variable (effect)
Du Plessis et al. (2008); Du Plessis (2016)	Suggestion system	Employee involvement (supporting)
	Management support, HRM support, feedback, recognition, incentives and rewards, quick implementation,	Organizational success with suggestion system (supporting)
Buech et al. (2010)	Feedback on non-implemented ideas	Employee motivation (facilitating)
	Relationship between employees and suggestion system (mediated by attitude of an employee and advantages of system)	Motivation to submit suggestions (stimulating)

Axtell et al. (2000)	Individual characteristics (i.e., active, feel taken seriously, not feeling hindered, high degree of perceived competence and autonomy) and participative environment	Participation in idea generation (stimulating)
	Organizational support	Participation in idea implementation (stimulating)
Frese et al. (1999)	Organizational barriers and high degree of job content	Degree of idea generation (inhibiting)
	Organizational support	Facilitates innovation process
Fairbank & Williams (2001)	Employees believe in their ability to perform, believe their performance ensures positive personal outcomes, expect the performance to be rewarding	Motivation to participate (stimulating)
Van Dijk & Van den Ende (2002)	Feedback, organizational support, encouragement, committed resources	Participation in innovation (facilitating)
Lasardo et al. (2016)	Organizational support, committed resources	Innovation process (facilitating)

2.5. Towards a conceptual model

Corresponding with the literature outlined above, we build on the EDI literature, combine it with the online suggestion system literature and propose that HRM activities may positively or negatively influence these EDI processes. In fact, the ways in which employees engage in EDI may be shaped by the different phases of the EDI process, the features of the online suggestion system, and the way in which the online suggestion system is used. In online suggestion system literature, most scholars describe the process, just as in IWB literature, in three phases. Therefore, this study adopts a distribution of three phases. These phases are called idea generation, idea development, and idea implementation. Furthermore, work-floor employee participation in EDI through online channels may be influenced by HRM activities. Hence, we expect an interplay between the features and use of the online suggestion system, the participation in EDI, and the HRM activities.

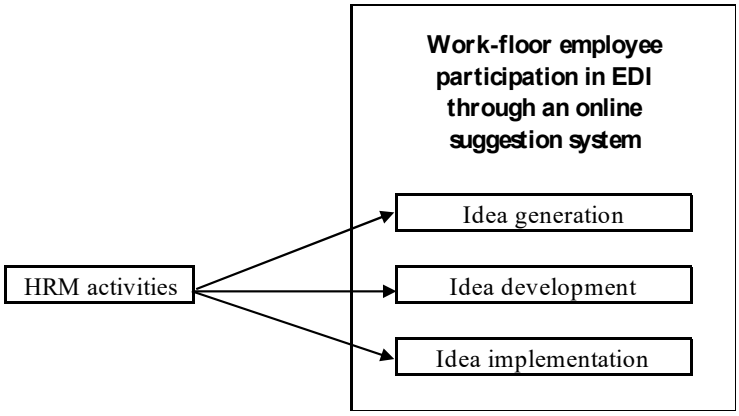

Figure 1: Conceptual model.

3. Methodology

In this section, we present the methodology including the research design, data collection, and data analysis.

3.1. Research design

Since the study explored the role of HRM activities in a rather unexplored context, namely EDI through an online suggestion system, the purpose was to create a better understanding. Therefore, to answer the research question, *'How can HRM activities facilitate/inhibit participation of employees from the work-floor in innovation through a (online) suggestion system?'*, it was appropriate to use a qualitative exploratory research design (Babbie, 2016). To expand the theory on HRM for EDI through an online suggestion system, a detailed, in-depth data collection through a multiple case study was conducted. A multiple case study empowers a wider exploration of research questions and theoretical enlargement (Eisenhardt & Graebner, 2007). Therefore, it was appropriate to study multiple cases. A multiple case study enabled us to analyze the organizations separately and compare them with each other (Yin, 2003). In this study, organizations using online suggestion systems to support EDI were part of the analyzed phenomenon. A case study provided the opportunity to elaborate on a broader class with an example from such a class (Seawright & Gerring, 2008).

Where inductive research seeks for facts, abductive research seeks a theory (Novak, 2001). As we studied HRM activities in a new context of EDI through an online suggestion system, this research sought indeed for a theory. Therefore, an abductive research strategy was used. Paul (1993) defined abduction as "the process of finding plausible explanations for some observed events" (p. 137). Since literature outlined that the lack of participation of employees is a weakness of an online suggestion system (Malhotra et al., 2019), this study intended to analyze the plausible explanations for this phenomenon by studying the interplay between the use of online suggestion systems and HRM activities. During the study we observed that not every organization uses the selected suggestion system. As a result, the research focus has shifted from participation in an online suggestion system, to participation in EDI with support from an online suggestion system. Accordingly, we analyzed the interplay between HRM activities and EDI with the online suggestion system as a tool.

3.2. Data collection

The research included the analysis of employee participation in EDI through an online suggestion system. Therefore, before selecting cases, an appropriate online suggestion system needed to be selected. The sampling of an online suggestion system was done purposively (Seawright & Gering, 2008). The selected online suggestion system needed to fulfill the following two criteria. First, the online suggestion system needed to contain a formal procedure for EDI (Du Plessis, 2016). Second, work-floor employees needed to be able to submit an idea, receive feedback on it (Fairbank & Williams, 2010), and develop their suggestion. The online suggestion system selected based on these criteria is Coimbee management software. Coimbee is specifically designed for continuous improvement and facilitates innovation by a

seven-step process (Coimbee, n.d.). In Figure 2 these steps were translated into the three phases from our conceptual model. Moreover, Coimbee includes a formal procedure for continuous improvement. Ideas can be developed and implemented on the basis of the PDCA circle (Coimbee, n.d.).

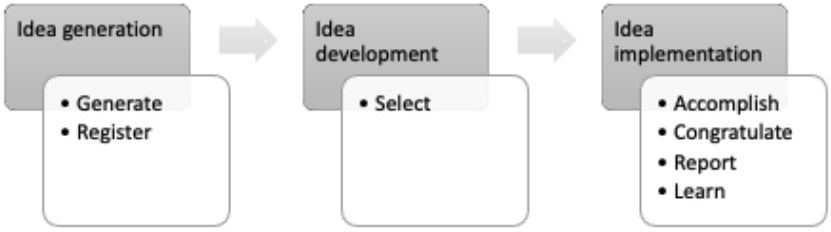

Figure 2: Steps of Coimbee translated into phases of EDI.

After we selected an online suggestion system, we selected four organizations using Coimbee as our cases. These organizations were contacted via the developer of Coimbee. Hence, the sampling of the four cases involved theoretical sampling (Eisenhardt & Graebner, 2007; Meyer, 2001). Theoretical sampling intents to select cases that can fill theoretical categories (Eisenhardt, 1989). The profiles of the cases selected are included in Table 4.

Table 4: Profiles of the selected cases.

Company	**SocialSecure. Inc.**	**Machine. Inc.**	**Energy. Inc.**	**Construction. Inc.**
Industry	Social security services	Machinery production	Energy supplier	Construction company
Size (employees)	400	100	300	80
Number of interviews	8 interviews *3 managers* *4 employees* *1 HR*	10 interviews *3 managers* *6 employees* *1 HR*	7 interviews *3 managers* *3 employees* *1 HR*	3 interviews *2 managers* *1 employee*

The data collection was done by conducting interviews, participant observation, and document analysis. This way of collecting data has strengthen the validity and trustworthiness of the study, as triangulation was used. We had received a contact person from each organization. The interviewees were then selected on the basis of snowballing sampling (Babbie, 2016). First, we asked the contact person to put us in touch with a number of teams and someone from the HR-department. After which, we asked the managers of different teams for work-floor employees who were open to conduct an interview. Each interviewee participated voluntarily in the interview. The interviews were conducted together with another researcher whose research was fairly similar in subject matter (Weghorst, 2021). In total 28 interviews were conducted with work-floor employees, with employees from the HR-department and with managers. Table 4 shows the distribution of the interviews held per organization and function of the interviewees. The interviews were held between November 2020 and January 2021. They were in Dutch. Due to COVID-19, the interviews took place online. Most are done with Google

Meets or Microsoft Teams. Two interviews were held over the telephone because it was not possible to do this via video calling. The average duration per interview was 47m 25s.

Before each interview, interviewees were informed about the aim of the research, and were ensured that the information would be treated confidentially and anonymously. Furthermore, interviewees were asked if the interview could be recorded. Three different interview protocols were made. Namely, one for managers, one for work-floor employees and one for HR. All kind of interviews were semi-structured and included open-ended questions. The interview protocols were included in Appendix I. These protocols represent a general script for the interviews and functioned as a main thematic structure. The interviewees got the opportunity to elaborate on the specific topics they wanted to discuss in the interview. After the interviews, these were all transcribed. Unique labels were attached to the transcripts. These labels referred to the organization, department and position of the interviewee. The labels begin with the letter A, B, C, or D to indicate the organization where the interviewee is employed. The next letter, A, AA or AB, B, C, D, or E, demonstrates the department of the interviewee. The last letters indicate the position of the interviewee. It concerns the following letters: MA (interviewee with a managerial position), WE (interviewee works in a team led by a manager), HR (interviewee works at the HR-department), S (interviewee is system administrator of the online suggestion system), and V (interviewee is part of a specialized improvement team).

Next to the interviews, we conducted a document analysis. Data was collected through the online suggestion system Coimbee of each company. The data retrieved from this analysis includes the total amount of ideas registered, the number of ideas per quarter, and the system usage (number of times logged in per quarter). This data enabled the researcher to gain more insights of the participation level of work-floor employees. Next to this data, Machine Inc. distributed us some company documents. In addition, we intended to do participant observation to observe how work-floor employees participate in EDI through an online suggestion system. Unfortunately, because of COVID-19 this was not possible at most organizations. We succeeded in doing one online participant observation of a meeting at Machine Inc. It was not possible to record this meeting. For this reason, notes were made during the observation.

3.3. Data analysis

For data analysis, the coding program Atlas.ti was used. We used a template analysis to code the data. Template analysis offered a structured approach to code data. It allowed to provide an audit trail and thus showed which choices are made while coding (King & Brooks, 2017). Justifying choices is an important aspect of conducting a case study (Eisenhardt & Graebner, 2007). The approach is flexible with the style and format of the template (King & Brooks, 2017). This fitted this study well as we collected data in a broad sense and just use some general concepts from literature (see conceptual model, Figure 1). A typical characteristic of template analysis is its highly iterative nature. There are some typical steps in template analysis, but these steps are not fixed. In Figure 3 these steps are illustrated.

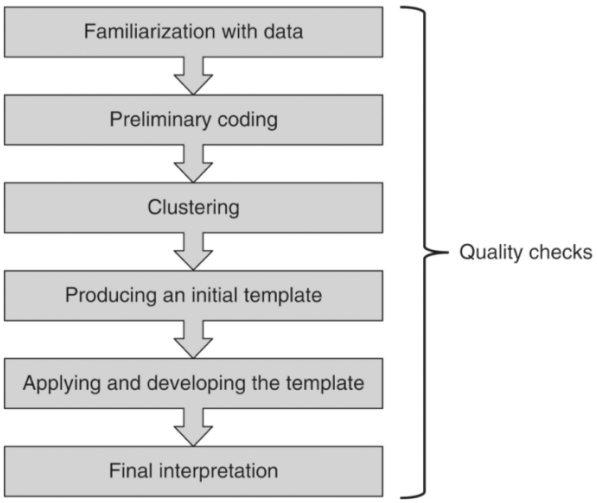

Figure 3: Typical steps in Template analysis. Source: King & Brooks (2017).

Based on these typical steps, we firstly scanned all transcripts and eliminated a number of typos. Secondly, preliminary coding took place (King & Brooks, 2017). Five diverse interviews were provided with open codes (i.e., first order codes). These five interviews were selected based on different organizations, different departments, and different positions. The first order codes were divided into the EDI phases when possible. Moreover, the codes were colored to indicate the effect. The colors are green (positive effect), yellow (neutral effect), and red (negative effect). The color codes were determined by first looking at the question. For example, interviewees were asked what was stimulating or hindering their participation. Next to that, we analyzed what interviewees literally said and how it came across. The preliminary coding resulted in many first order codes, namely 273 codes. Subsequently, these first order codes were examined to see if some could be merged. Thirdly, the first order codes were clustered in second order codes. And fourthly, an initial coding template was created (King & Brooks, 2017). Since we used an abductive approach and we had developed a conceptual model from literature with general concepts, these concepts were taken into consideration while doing the preliminary coding. The researcher, therefore, is not completely open-minded. To avoid bias, the initial template was sent to another researcher for a quality check. Together with the other researcher, the initial template was discussed, after which the feedback was processed. Based on the modified initial coding template, we continued to code the interviews. However, when a total of 11 interviews had been coded, the total number of first order codes again had increased to 301 codes. Because of this, we chose to go back to revising the open codes and initial coding template. This time the quotes were hung under more general codes which resulted in 271 first order codes.

Subsequently, we proceeded to code the interviews. Due to the iterative nature of template analysis, it was possible to adjust the template during coding. Finally, 28 documents were coded which resulted in 1940 quotations, 274 first order codes, 27 second order codes, and five third order codes. The final coding template is attached in Appendix II. During the analysis of the codes, a few codes have been merged as they could be seen as the same influence. An example of this is employee turnover.

While this code was first seen as a separate code, it was eventually categorized under the code time. Moreover, it emerged that most factors influencing idea development also have an influence on idea implementation, therefore, these two phases are merged (Figure 4).

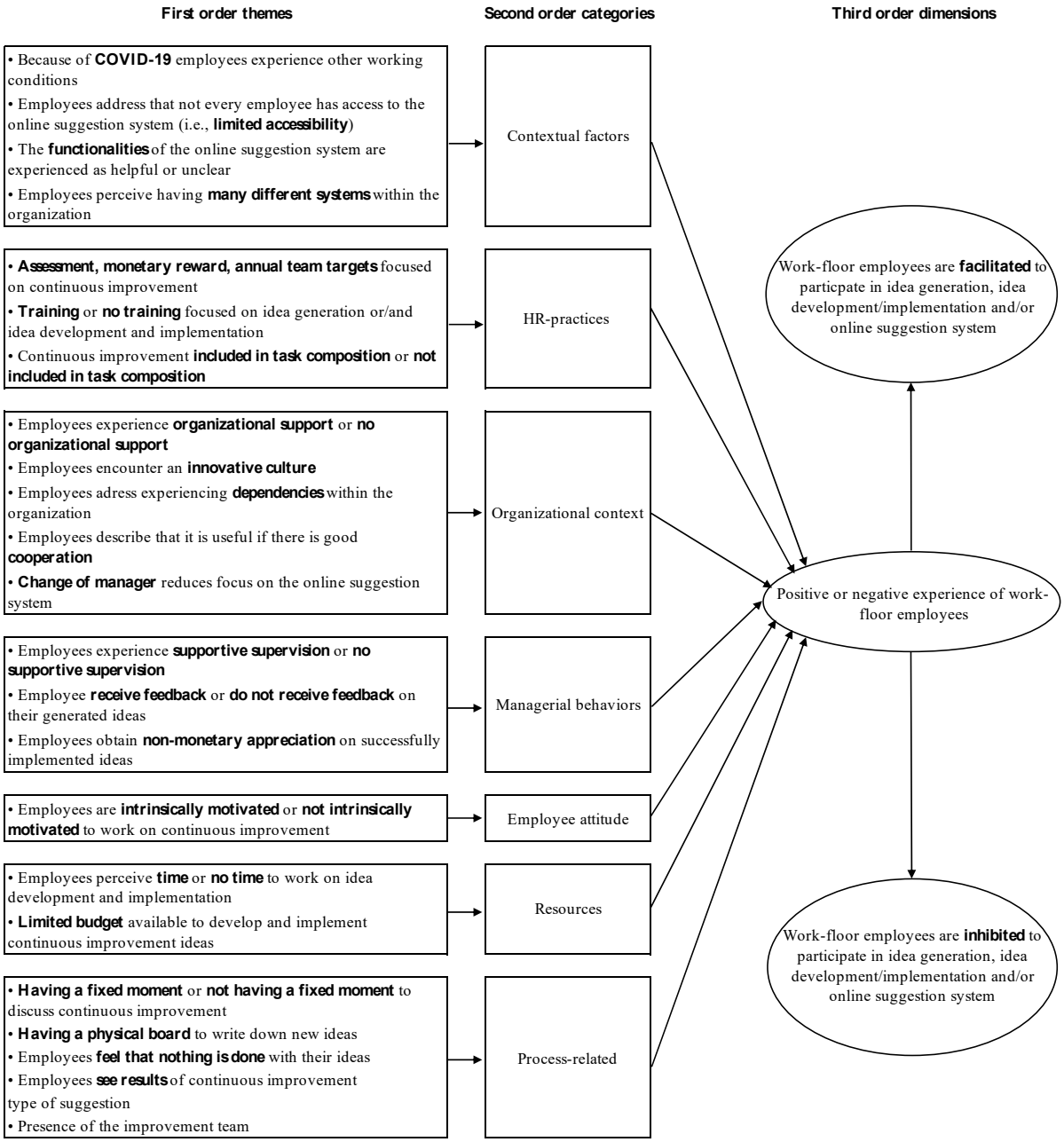

Figure 4: Data structure.

4. Results

In this chapter the results are described. First, the participation of work-floor employees in EDI is explained per company. This is followed by an elaboration of the antecedents that influence the participation of work-floor employees in EDI and an online suggestion system. Finally, a conceptual model is illustrated with all relevant influencing clusters.

4.1. Participation of work-floor employees in EDI through an online suggestion system

During the study, it was noticeable that there is a difference in the participation of employees in the EDI process. In some organizations work-floor employees can participate in all phases of EDI, while in other companies there are less opportunities. Moreover, the usage of Coimbee appears to be different between the four organizations. The online suggestion system seems not fully implemented by all organizations. This is partly due to the fact that two organizations use other tools next to Coimbee. Moreover, within no company all employees have access in the online suggestion system. As explained in the methodology, the unit of analysis became the EDI process. The online suggestion system can be seen as a tool that organizations use to structure the EDI process. Table 5 provides an overview of the participation of work-floor employees. Below the table, the participation of work-floor employees in EDI and the online suggestion system is further explained per company.

Table 5: Participation profiles of the organizations.

Company	**SocialSecure Inc.**	**Machine Inc.**	**Energy Inc.**	**Construction Inc.**
Use Coimbee since	2017	End of 2019	Early 2019	September 2020
Total amount of ideas	430 (of which 311 before 2019)	231	477	23
Coimbee users	Per team different; not all employees have access	Improvement team plus some managers; not all employees have access	Especially specialized employees; not all employees have access	Selected group of employees/ managers
Usage level of Coimbee	Low	Medium/high	Low/medium	Medium
Other systems used for EDI	Trello, Microsoft Teams	-	Trello	-
Work-floor employee participation level in EDI	High ++ idea generation + idea development and implementation	Medium ++ idea generation +/- idea development and implementation	High ++ idea generation + idea development and implementation	Low + idea generation – idea development and implementation

Note. ++ = very high level; + = high level; +/- = sometimes high level, sometimes low level; – = low level

4.1.1. SocialSecure Inc.

SocialSecure Inc. started with Coimbee in 2017. They were one of the first users of Coimbee and gave a lot of feedback on it. As illustrated in Table 5 most of the ideas have been put in the online suggestion system before 2019. Moreover, the data attracted from Coimbee shows that the number of logins has been greatly reduced. In Q3 of 2019 employees logged in 501 times, in Q3 of 2020 this was only 153 times. Therefore, the usage of Coimbee can be seen as low because the online suggestion system is hardly used. At SocialSecure Inc. there are a lot of different systems used to facilitate EDI. For example, Trello, Microsoft Teams and some still use Coimbee. There is more focus on EDI itself: *"We do not use the toolbox itself as a resource, we do not or hardly use it. The dynamics of improvement and things like that, of course, because that is independent of the means you use for it."* – AAMA01. Interviewees of SocialSecure Inc. mention various reasons why they do not or rarely use Coimbee. For example, it is referred to as an external program with extra log in data. They would rather see it arranged in the current programs: *"Yes, I am not much in favor of toolbox (Coimbee) myself. But that is more because it is an external program and I would prefer to see everything arranged in Teams, for example."* – AAWE02. Furthermore, it was not communicated that Coimbee had to be used and there has been no proper explanation. That is why employees who did not immediately understand the online suggestion system have ignored it. In addition, employees see Coimbee as an unclear system, where it was not possible to work efficiently. Lastly, not all employees have access to Coimbee, which makes it difficult to use the online suggestion system. Since Trello and Teams are part of the internal systems, all employees have access to these systems. This makes it easier according to interviewees to work with those systems for continuous improvement.

The HR-department of SocialSecure Inc. was not familiar with Coimbee. *"Well, the only thing, I think I also indicated that in the mail, that the toolbox (Coimbee) is not known to me anyway."* – ADHR01. The HR-department therefore has no insight into the ideas in the online suggestion system and how employees participate in it. Because HR does sit down in meetings with managers, they sometimes hear about EDI, but they are not really involved in this. During selection of future employees, continuous improvement is a subject of discussion. For example, innovative cases are presented, and they examine how people look at continuous improvement. However, there is no specific HR-policy concerning continuous improvement. They were triggered by the study to get more involved in the EDI process. *"But I do find it interesting, so I will see if I can indeed bring that in, to bring that to light more often. And also, let's see if we put even more focus on that, especially within those teams, what that in turn can bring about."* – ADHR01.

At SocialSecure Inc. work-floor employees are able to participate in the whole process of EDI. In most cases, the employee who generated an idea also has to develop and implement it: *"Often an idea starts with discussing it with the team. Then and then you see who is going to pick it up and often the person who comes up with it is also the one who is going to pick it up. And then he will break down the tasks for himself, and if necessary, also discuss them with the manager."* – ABWE04. However,

there are employees at SocialSecure Inc. who are specifically responsible for the improvement process. Their main tasks are to coordinate and monitor the development and implementation of ideas: *"He mainly monitors the actions and especially the result. So, okay, is this what has been delivered, does that fully meet expectations? And that also helps from ok have you already looked at that? The one that stings a bit, so that people can actually do it themselves."* – ABMA03. Work-floor employees stay involved but are supervised by an improvement specialist. In some cases, employees cannot participate in idea development and implementation. The reason for this may be that an employee is not part of a project group: *"I think that it (participation in idea development and implementation) is very dependent on whether you are part of such a project group. Lately, I have been part of a lot of project groups, and you are really actively involved in that."* – AAWE01. Furthermore, it may also be that the idea cannot be developed and implemented by employees because they are not able to do it: *"Yes, it (participation in idea development and implementation) depends a bit on whether it is something we can pick up ourselves."* – ABWE04. Therefore, the participation of employees in idea development and implementation seems a bit lower than in idea generation. Overall, it still seems that the participation of work-floor employees in EDI is high.

4.1.2. Machine Inc.

Machine Inc. uses Coimbee since the end of 2019. They have chosen to appoint a special improvement team to lead the process. The members of the improvement team are selected on a few criteria: young, relatively new in the organization, intrinsic motivated to work on continuous improvement, and communicative. A company document shows that members are allocated four hours a week to occupy themselves with continuous improvement. The improvement team was created to implement the online suggestion system in the organization. This is an ongoing process. Ultimately, the intention is for the manager to take the lead in the process instead of the improvement team. At the moment, the system within Machine Inc. is mainly used by the improvement team and some managers. Next to the improvement team two managers have access to Coimbee. Both managers work in the company's factory. According to interviewees continuous improvement with Coimbee is not very much alive at the various departments within the company. Especially in the offices, the subject of continuous improvement seems to play a limited role: *"But I must say in our department that (continuous improvement with Coimbee) is not very much alive yet, so everyone is just busy with their own work, and then you hear something from time to time."* – BBWESV02. Nevertheless, the usage of Coimbee can be seen as medium/high because the ones who have access in the online suggestion system use it on a weekly basis. Furthermore, data from Coimbee shows that since they started using the system, they have logged in about the same number of times every quarter.

According to improvement team members the online suggestion system adds value to the EDI process. Using Coimbee, improvement ideas are noted. This ensures that employees are less likely to return to the old working method. So, it seems that by using the system more ideas are actually being implemented. Furthermore, Coimbee provides overview of improvement suggestions and makes it

easier to monitor the process. On the other hand, there are some that see less value in Coimbee. For example, Coimbee is perceived as unclear by various employees: *"Well, I think it is, at least what I hear from others, it is quite unclear at times. Because there are so many functions on it that are also not used. Or yes, of which we have not really seen the use yet."* – BBWESV02. Furthermore, not all employees who have to work with Coimbee have access to a computer at Machine Inc. This makes it more difficult to use the system: *"No, I don't think that the site works very well on my phone. So yes, that's why I don't like it very much. I don't know exactly, I just know how to add an idea, say, and it ends there."* – BAAWEV04.

The HR-department at Machine Inc. is familiar with Coimbee. However, the department is only involved in the use of the online suggestion system and the EDI process when there is an HR-related suggestion. So, there is no involvement of HR in facilitating work-floor employees to participate in EDI through an online suggestion system. Moreover, there is no HR-policy for continuous improvement. During the interview, the interviewee of the HR-department mentioned that perhaps HR should be more involved in enabling and stimulating work-floor employees. *"But about such things as those, I think they don't think about that. And that I mean more with that what actually involves me, yes, I might be able to do a little more in that."* – BEHR01.

The intention is that work-floor employees ultimately participate in the entire EDI process. Nonetheless, in most cases employees play a greater role in idea generation than in idea development and implementation. A company document presents the continuous improvement process with a few steps. This shows that employees are only expected to generate ideas. The improvement team weekly discusses these ideas by determining an action plan and discussing the progress of ideas. Together with some managers they take the lead in the idea development and implementation. According to interviewees work-floor employees can be involved in these phases when they are needed. The improvement team together with managers takes the lead in idea development and implementation. Eventually, managers will become fully responsible for the selection, development and implementation of ideas. *"But the person who comes up with an idea does not mean that it is also the implementing party or the deciding party or the, that is actually the manager of that department. Ultimately, he has to make the decision."* – BAMAV01. Due to the implementation of Coimbee, the two affiliated managers started a weekly day start to give work-floor employees the opportunity to submit ideas and discuss the progress of improvement suggestions of the employees. This creates a way for employees to participate in the EDI process. In general, the participation level of employees in EDI can be seen as medium because work-floor employees foremost participate in idea generation.

4.1.3. Energy Inc.

Energy Inc. introduced Coimbee at the beginning of 2019. The first year much attention was focused on the use of Coimbee, which meant that the system was widely used by all teams within the operation of Energy Inc. However, the respondents indicate that in 2020 less attention was paid to the use of the system and that it was actually used less. *"What you notice is that we spend a lot less time and attention*

on this. And every now and then something slips, you know, we are talking about 'oh this and this must be different, this must be better' and then someone shouts 'oh put it in Coimbee because then we can guard it there'. But we no longer have that full attention as we had in previous years, last year." – CCMA03. The lower usage of the online suggestion system also shows from the data attracted from Coimbee. Whilst in Q3 of 2019 employees logged in 659 times, in Q3 of 2020 employees only logged in 37 times. Therefore, the usage level of Coimbee can be seen as low/medium. In principle, every employee had access to the system. In the last year a lot of new employees have not been given an account for Coimbee when they started their employment. Furthermore, interviewees mentioned that improvements are being done without using the online suggestion system.

Employees see value in Coimbee due to the structure and overview it provides. *"The reason why I do think that Coimbee is very positive, because it gives you a very clear and clear overview of what needs to be done and also description of this and how it stands. (…) So, I think it is a very useful tool to keep an overview of what you are doing as a team and employee."* – CCWE02. Moreover, an online suggestion system makes it easier to monitor the EDI process, prevents double work, and makes it possible to identify the benefit of an idea. On the other hand, Coimbee is seen as a system with a quite high threshold because of two reasons. The first reason is the extensiveness of the online suggestion system. Employees see Coimbee as a system with too many functions, which makes it complex and difficult to work with the online suggestion system. Secondly, Coimbee is a system that requires employees to open a separate page and they need to log in. *"Last year I got that back form a number of employees that they were like 'yes oh yes one I just forget, because I have to log in again. And you know it is not open by default. And two, there are so many fields that I just don't know how to fill them in exactly'."* – CBMA02. Next to Coimbee, Trello is used by the organization to store ideas and monitor the progress. According to some process experts this program works easier.

The HR-department within Energy Inc. was not familiar with Coimbee. They are familiar with the concept of continuous improvement, and that it occupies an important place within the organization. Since HR has introduced a number of working methods in which continuous improvement plays a role, it can be said that continuous improvement seems woven into the organizational policy. For example, they introduced the lean methodology, scrumming, and agile working. In addition to these working methods, continuous improvement is taken into account in the selection process. It is examined whether any future employees are open to innovation. However, there is no HR-policy supporting participation of work-floor employees in continuous improvement. The HR employee was triggered by the interview and indicated that HR could possibly do more to support the participation of employees in EDI. *"I think HR could possibly mean more to that (EDI process). To support and facilitate yes, from the HR point of view. That is of course a bit less now, everyone goes for themselves. And maybe we continuously improve differently in each team. We don't know, and perhaps coordinating or bringing together a kind of methodology, that it is up to HR to do that."* – CDHR01

Work-floor employees can participate in the whole process of EDI. The organization mainly expects employees to come up with ideas and indicate them during a day start or communicate them to a process expert. The process expert then takes the lead in idea development and implementation. A process expert is a separate function for employees who are trained to work on continuous improvement. *"And when you do that more often or whether that suits you better, then we also have a separate function for that. Then you are a process expert and then you can really get started with continuous improvement and put a lot of time there."* – CDHR01. If employees want to, they can participate in these phases. *"But if an employee then says I would like to stay involved or see specific things, then there is room for yes."* – CBMA02. In most cases, employees must indicate themselves that they want to stay involved. The participation level of employees in EDI at Energy Inc. can be seen as high because employees are expected to generate ideas and, if they wish, they can also participate in idea development and implementation.

4.1.4. Construction Inc.

Construction Inc. has been using Coimbee as a pilot since September 2020. In December it was decided to continue to use the online suggestion system. So, this organization is still in the early stages of implementing Coimbee. First, some managers were involved in continuous improvement through Coimbee. More and more managers and employees are involved each time. *"So, I did that on the basis of three enthusiasts I started it. At one point, that turned into an oil slick that slowly spread to so many users. That we said okay we will continue with this."* – DWES01. However, these users are office workers. No construction workers yet have access to the online suggestion system. They are still figuring out how to involve those employees. Hence, the usage level of Coimbee can be seen as medium at Construction Inc.

Interviewees from Construction Inc. were very positive about the benefits of an online suggestion system. *"What I now experience is that the very simple version is that it is just a one and a central place where you can improve improvements, can record improvement actions. (...) Where when you are going to use it, you really realize that an online tool is just much more practical or pleasant. (...) And what I do see is that we didn't have that before we started using this."* – DAMA01. They mention the following advantages: online collaboration with others, overview of all improvements, easy linking of improvements to objectives, and safeguarding and monitoring improvements.

At this stage, ideas mainly come from department plans that are made up at the beginning of the year. These plans are made during a team meeting, after which the management needs to approve. In a sense it can be seen that employees contributed to the idea generation. It is not the case that work-floor employees who in the meantime have ideas can forward those ideas for continuous improvement. It was mentioned that this will probably be the case when Coimbee is fully implemented within the organization. *"It is not that it is during that you, huh, so those are really created moments with a department plan and 'ok guys come on with your ideas'. And then we turn it into sheets and then we get to work. But really really come up with ideas, I have to do something with that, that is not yet possible.*

– DAMA01. Moreover, the employees who insert an idea in Coimbee will be responsible for the idea development and implementation. Since most of the users of Coimbee are managers, the participation level of work-floor employees is low in these phases. *"In principle, the person who introduced the improvement suggestion remains the owner of the suggestion."* – DBMA02. Overall, the participation level of work-floor employees is currently low. It appears that this is because Construction Inc. has just started the actual implementation of the online suggestion system. The intention is that employees will participate more in the EDI process.

4.1.5. Conclusion participation in EDI through an online suggestion system

Different working methods with EDI and online suggestion system

The use of Coimbee appears to be different at all four companies. SocialSecure Inc. and Energy Inc. make little use of Coimbee. In previous years, the system was used more regularly. Nowadays, they use other systems next to Coimbee for continuous improvement (i.e., Trello and Microsoft 365). Despite, the lesser use of Coimbee, the participation level of work-floor employees in EDI seems high at these two organizations. Work-floor employees get the opportunity to participate in the complete EDI process. Employees can use the other available systems within the organization for the registration and progress of ideas. Machine Inc. and Construction Inc. are still focusing on implementing Coimbee within the organization. It may be that this ensures a higher use of Coimbee and lower participation level of work-floor employees in EDI.

Missing role of the HR-department

Overall, the link between EDI and HR-policy seems missing within the organizations. Interviewees from the HR-department have indicated that there is no specific HR-policy regarding continuous improvement. At only one organization the interviewee from HR knew about the existence and use of the online suggestion system. So, the role of the HR-department with continuous improvement and especially the online suggestion system seems absent within the organizations. Moreover, interviewees stated that they find it remarkable that the role of the HR-department is missing. Specifically, employees from the HR-departments mentioned that they should and could do more with continuous improvement and the online suggestion system. While the HR-department is not concerned with the participation of work-floor employees in EDI through the online suggestion system, employees do experience antecedents that facilitate or inhibit their participation. So, it can be said that other stakeholders within the organizations are executing these factors. These can be managers, specialized employees or the management. In the remainder of the chapter, the antecedents experienced by work-floor employees are elaborated. This has been viewed from three different perspectives: the HR-department's, the manager's, and the employee's perspective.

4.2. Antecedents affecting the participation of work-floor employees in EDI through an online suggestion system

In this section, the antecedents affecting the participation of work-floor employees will be explained. The antecedents are divided into different clusters. The first cluster, HR-practices, include strategic initiatives to manage employees. Next to HR-practices other important influential factors were found. External context includes external circumstances that form a setting in which organizations operate. The factors at the organizational level are named organizational context. Moreover, managerial behaviors are actions performed by a manager. In addition to a manager, these actions can also be performed by specialized improvement employees. The following, employee characteristics, includes characteristics of work-floor employees. The cluster process-related contains factors associated with the EDI process. The last cluster, resources, includes factors that have to do with means that employees (not) have to their disposal for continuous improvement. Table 6 shows an overview of all antecedents that affect participation of work-floor employees in EDI per organization and the degree of this positive or negative effect. Concerning the order of importance, no distinction is made for Construction Inc. This because we held only three interviews, which makes it impossible to make a clear distinction. Appendix III demonstrates a table per company which provide a more detailed description of the antecedents facilitating or inhibiting work-floor participation. In those tables the antecedents are described per cluster and are supported with sample quotes and mechanisms. These mechanisms came up during the analysis of the interviews. Moreover, the mechanisms explain how the antecedents are related to the participation. Work-floor employees experience these mechanisms as a result of the interpretation of the antecedents (e.g., positive or negative). So, the focus is on the employees' experience. Employee experience is defined as both the interpretation of the antecedents and the perception of the mechanisms. It concerns five mechanisms that can be experienced both positively and negatively by work-floor employees. The definitions of the mechanisms are included in Table 7.

Table 6: Overview antecedents affecting participation in EDI.

EDI phase	**Idea generation**				**Idea development and implementation**			
Company / **Antecedent**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
• HR-practices								
Assessment	+		+	+	+		+	+
Annual team target			+	+			+	+
Monetary reward	+		+	+	+		+	+
Training			+	+	+			
No training							-	
Included in task composition	+		+					
Not included in task composition		0			-	0	0	-
• External context								
COVID-19	--	--	--	-	--	--	--	-
• Organizational context								
Organizational support	+		+		+		+	

No organizational support		-		-		-	-	-
Innovative culture	+	+	+	+	+	+	+	+
Dependencies					--	-	--	
Cooperation					+	+	+	+
• Managerial behaviors								
Supportive supervision	++	++	++	+	+	+	+	+
No supportive supervision		-		-				
Getting feedback	+		+	+				
Not getting feedback	-	--	-					
Non-monetary appreciation	+	+					+	+
• Employee characteristics								
Intrinsic motivation	++	++	+		+	+	+	
No intrinsic motivation	-	-	-					
• Process-related								
Fixed moment of attention	+	+	+		+	0	+	
No fixed moment of attention			-				-	
Physical suggestion board	+	+	+	+				
Feeling that nothing is done		--	--	-				
Seeing result						+	+	+
Easy suggestion					+	+	+	
Difficult suggestion					-	-	-	
Improvement team						+ -		
• Resources								
Having time					+		+	
Having no time					-	--	--	-
Limited budget					-	-	-	

Note. 1 = SocialSecure Inc.; 2 = Machine Inc.; 3 = Energy Inc.; 4 = Construction Inc.
++ = very positive effect; + = positive effect; 0 = neutral effect; - = negative effect; -- = very negative effect

Table 7: Definition mechanisms.

Mechanism	Definition
Ability	Possessing the skill to participate
Inability	Not possessing the skill to participate
Motivation	Motives to participate arising from external sources, in this case the antecedents
Demotivation	Deprive motives to participate arising from external sources, in this case the antecedents
Opportunity	Circumstances that make it possible to participate
Impossibility	Circumstances that make it impossible to participate
Willingness	Attitude of employees to want to participate
Unwillingness	Attitude of employees to not want to participate
Expectation	Employees' sense that they are expected to participate
No expectation	Employees' sense that they are not expected to participate

4.2.1. Antecedents affecting participation in both phases of EDI

It appears that there are several factors where it is not possible to assign these to a specific phase of EDI. These factors have an effect on the participation in EDI in general. For most factors, it depends on the focus of the factor. It concerns the following factors: 'assessment, annual team target, and monetary reward', 'training', 'task composition', 'COVID-19', 'organizational support', and 'innovative culture', and 'fixed moment of attention'.

HR-practices

Assessment, annual team target, and monetary reward

'Assessment', 'annual team target' and 'monetary reward' are three separate HR-practices. However, it seems that these HR-practices are interrelated and are often used together. Therefore, it occurs that they have a combined effect on the participation of work-floor employees in EDI. When these HR-practices focus on continuous improvement it seems to lead to a higher participation in EDI. In all organizations, except Machine Inc., an assessment takes place related to continuous improvement. Assessment is the systematic evaluation of employees on their performance on the basis of fixed subjects, of which continuous improvement can be a part. Moreover, at the organizations where work-floor employees are assessed on continuous improvement, a bonus is attached to the assessment. Receiving a bonus is a form of monetary reward. At Energy Inc. and Construction Inc. they set annual team targets related to continuous improvement. Work-floor employees are then assessed on those annual team targets. At SocialSecure Inc. the assessment comes with some limitations. Work-floor employees can choose individual goals where they are being assessed on. The monetary reward is based on the assessment. So, if employees do not choose continuous improvement as a goal for their assessment, then the bonus is also not determined on the basis of continuous improvement. However, most interviewees from SocialSecure Inc. indicated that they included continuous improvement in their goals. The voluntary choice of continuous improvement as an individual goal means that work-floor employees must want to work on continuous improvement themselves. So, an employee must be motivated in advance to choose continuous improvement as an individual goal for assessment. Looking at Energy Inc., in 2019 the management decided to include continuous improvement into the annual team targets which meant that work-floor employees were being assessed on it and a bonus was attached to it. In 2020 there was no annual team target attached to continuous improvement. Interviewees mentioned that they think this was one of the reasons that employees participated less in EDI in 2020. *"This year, we have not specifically included that in the goals, so then you see that the focus is also on other things."* – CBMA02. Data from Coimbee supports the image that employees participate less in EDI in 2020 than in 2019. In 2019, the combination of the team targets with the assessment and monetary reward seemed to result in a higher participation in EDI. Construction Inc. is still working on the implementation of EDI in the organization. They are not yet being assessed and rewarded on continuous improvement. However, they mention that they think it will stimulate the participation of work-floor employees in the EDI process. The combination of 'assessment', 'monetary reward', and 'annual team target' makes work-floor employees aware that participation in EDI is expected from them. Additionally, it stimulates the motivation of work-floor employee to participate in EDI. Thus, it can be said that these three HR-practices appear to promote expectation and motivation mechanisms. These mechanisms seem to facilitate work-floor employee participation. An important condition is that the 'assessment', 'monetary reward', and 'annual team targets' are focused on continuous improvement to establish the positive influence on work-floor employee participation.

Training

'Receiving training' seems to have an effect on idea generation as well as idea development/ implementation. The effect on idea generation or idea development/implementation depends on the focus of the training. A training can be aimed at improving the ability of work-floor employees to come up with ideas or execute ideas. At Energy Inc. every work-floor employee received a yellow belt training. Yellow belt training focuses on enabling employees to recognize potential improvements and thus enabling employees to come up with new ideas. Interviewees cite these training courses as ability-enhancing in which work-floor employees gain skills to generate ideas. Therefore, they perceive this kind of training as stimulating their participation idea generation. Moreover, Construction Inc. received training courses from the consultant of Coimbee which they perceived as ability-enhancing to get started with idea generation. These courses were mostly related to problem formulation and the question 'what is a suggestion?'. It can be stated that training can have a positive effect on participation from work-floor employees in idea generation by influencing the mechanism ability. A prerequisite for this is that the training is focused on idea generation.

Because work-floor employees from Energy Inc. do not receive specific training to gain abilities to work on idea development/implementation, they experience it is harder to participate in it. Employees can stay involved, but a specially trained improvement employee will take the lead. So, 'receiving no training' appears to ensure less participation in idea development/implementation by not gaining the ability which makes the opportunity to participate more difficult. In this case the underlying mechanism is inability. This is related to the presence of specialized improvement employees and 'task composition' (elaborated in the following paragraph). Whereas for these employees, it is part of the task composition to work on idea development/implementation, for work-floor employees it is not. Employees seem to receive training for skills that are needed to execute their tasks. At SocialSecure Inc. work-floor employees can be given the opportunity to receive training so they gain the ability to develop and implement ideas. Work-floor employees state the enthusiasm of the organization to invest in them is an extra motivation to participation. Next to facilitating the ability to participate in idea development/ implementation, motivation to participate is also being facilitated by training at SocialSecure Inc. Hence, 'receiving training' focused on idea development/implementation seems to ensure higher participation in idea development/implementation by stimulating the mechanisms' ability and motivation.

Task composition

At SocialSecure Inc. and Energy Inc. idea generation is 'included in the task composition' of work-floor employees. At SocialSecure Inc. every employee is expected to generate ideas. The expectation that work-floor employees will contribute ideas is conveyed orally. Moreover, Energy Inc. included in the job description of work-floor employees that they are expected to think about possible improvements and communicate their ideas. Because generating ideas is part of the task compositions of work-floor employees, work-floor employees indicate to participate more in idea generation. This increased participation is caused by the mechanism expectation because work-floor employees experience they

have to participate. According to interviewees from Machine Inc., continuous improvement is 'not included in the task composition'. It is, however, included in the task composition of members of the improvement team. It seems that this does not immediately cause work-floor employees to participate more or less in EDI in general. Therefore, the effect of not including continuous improvement in the task composition seems neutral for Machine Inc.

At all four organizations idea development/implementation is 'not included in the task composition' of work-floor employees. At SocialSecure Inc. some employees got the task of monitoring the development and implementation of ideas. They suggest that work-floor employees who are not having idea development/implementation included in their tasks, might be less motivated to work on it. Moreover, at Energy Inc. managers find it logical that work-floor employees participate less in the development and implementation of ideas because it is not part of their job description. This is also because there are special improvement employees for whom idea development/implementation is part of the job description and who are also specially trained for this (related to 'training'). Furthermore, Construction Inc. also got an employee who is specifically responsible for improvements. However, it is not mentioned that this ensures less participation of work-floor employees. Hence, the effect at Construction Inc. needs to be seen as neutral. For Machine Inc, the effect of not including continuous improvement is generally neutral. Work-floor employees indicate that, even if it is not expected, they do participate because of their 'intrinsic motivation' (described later). So, not including idea development/implementation in the task composition might lower the motivation of employees to participate in this phase. Nonetheless, when employees are intrinsically motivated, not including continuous improvement in the task composition seems to have no effect on participation. Furthermore, employees who do not feel that it is expected of them to participate, may not do so. Therefore, it can be said that not including idea development/implementation in the task composition inhibits the mechanism motivation (i.e., establishes demotivation) which causes less participation of work-floor employees.

External context

COVID-19

The COVID-19 crisis appears to be a hindering factor for participation in EDI in general. Moreover, COVID-19 seems to negatively affect other factors. Many employees work from home, which makes it more difficult to carry out certain (HRM) activities. For example, it affected training courses: *"Well, they would initially they would do training. But then came corona, so that did not happen."* – AAWE01. Furthermore, day starts are held differently. Before COVID-19, day starts at Energy Inc. were held in the office and specific topics were discussed, including continuous improvement. Nowadays, the day starts take place online. As a result, there is no place to discuss continuous improvement in it. For most employees of Machine Inc., it is necessary to be present in the company to perform their work. Nevertheless, according to interviewees disadvantages are experienced. For example, when employees have to be quarantined. This ensures that work backlogs are incurred and that there is extra pressure at a department during the absence of a colleague. All this means less time to spend on continuous

improvement. Moreover, there is an investment freeze. Therefore, all ideas that require an investment are impossible to implement. Furthermore, working from home seems to affect the dynamic of continuous improvement because there is less interaction between employees. The underlying process that leads to less participation is, due to aforementioned consequences, that there is less attention and space for EDI. Where employees normally share their frustrations with each other when they are in the same room and come up with solutions together, this seems difficult when everyone is working from home. As a result, work-floor employees experience that there are fewer opportunities. Hence, the mechanism experiencing impossibilities appears to inhibit the participation of work-floor employees in EDI in general. In addition, COVID-19 hinders many other antecedents.

Organizational context

Organizational support

'Organizational support' seems to be able to influence participation in EDI both positively and negatively. This effect depends on whether or not the work-floor employees experience 'organizational support'. At SocialSecure Inc. there is no specific continuous improvement policy from management. However, interviewees experience that the organization stimulates and encourages them to participate in EDI. They address to experience this because the organization is open to improvements, wants to grow, and communicates that the service they offer to customers must be maintained. Similarly, at Energy Inc. work-floor employees address feeling stimulated by the organization to participate in EDI because they show appreciation for successfully executed ideas. However, one manager state they do not know whether management really wants work-floor employees to participate in the idea implementation. Within SocialSecure Inc. and Energy Inc. work-floor employees are encouraged by the organization to participate in EDI, which gives employees the feeling that they can invest time in it. So, the 'organizational support' appears to create an opportunity for work-floor employees to participate in EDI. Next to this mechanism, 'organizational support' seems to create an expectation that employees should participate in continuous improvement. On the contrary, at Machine Inc. and Construction Inc. work-floor employees experience no organizational support which seem to inhibit participation of employees in EDI. *"Well, not really yet (opportunity of work-floor employees to participate). Because the management doesn't really support it yet."* – DWES01. Because the management does not support EDI, employees seem to feel that they cannot participate in continuous improvement. So, perceiving 'no organizational support' ensures experiencing impossibilities to participate in EDI, which in turn, causes less participation.

Innovative culture

At all companies the interviewees mentioned that an 'innovative culture' should facilitate participation of work-floor employees in EDI. SocialSecure Inc. seems to have a fairly innovative culture. Interviewees point out the organization is open for improvements which gives employees more opportunities to participate in continuous improvement. According to HR and some managers, Machine Inc. is a flat organization with many loyal employees who want the best for the organization. This culture

seems to establish that employees participate more in EDI, because they want to and there are more opportunities to participate. So, the mechanisms underlying 'innovative culture' are experiencing willingness and opportunities. The same applies to Energy Inc., according to interviewees, a flat organization makes it easy to discuss ideas. At Construction Inc. interviewees discuss that the ultimate goal is to obtain an innovative culture to facilitate participation of work-floor employees. This indicates that this is not yet the case. This makes sense since the company is still really at the beginning of the implementation of EDI through an online suggestion system. To conclude, an 'innovative culture' seems to facilitate participation of employees in EDI by creating an opportunity for employees to participate and by increasing employees' willingness to participate.

Process-related

Fixed moment of attention

Having a 'fixed moment of attention' to discuss suggestions seems to facilitate the participation of work-floor employees in EDI in general. A fixed moment of attention can, for example, be a day start with the entire team, a team meeting, or a one-on-one meeting with a manager. At SocialSecure Inc. employees are given the opportunity to share ideas and contribute to the development of ideas during the day start. Next to this, monthly team meetings take place and employees have conversations with managers in which managers regularly ask employees if they have any ideas. At Machine Inc., employees are mainly asked for ideas and kept informed of progress during the day start. The influence therefore depends on what is discussed during such a fixed moment. The moment the entire EDI process is discussed, this stimulates participation in the entire process. When work-floor employees are only given the opportunity to contribute ideas, this will only increase the opportunity to generate ideas and facilitate participation in idea generation. Overall, the mechanism supporting participation in case of 'fixed moment of attention' is experiencing an opportunity to participate. Moreover, Energy Inc. held a weekly day start in 2019 in which continuous improvement was a fixed topic. Due to current circumstance with COVID-19, the day start now takes place online. Continuous improvement is no longer a topic within these day starts. Interviewees indicate that they expect this to be one of the reasons that continuous improvement and Coimbee play a smaller role. As discussed earlier, the data from Coimbee also shows that there was less participation in 2020 than in 2019. Therefore, it can be seen that 'not having a fixed moment of attention' decreases the opportunity to participate which inhibits participation of work-floor employees in EDI in general. So, when work-floor employees experience impossibilities this decreases participation of work-floor employees.

Conclusion antecedents affecting both phases of EDI

To conclude, for the above-mentioned antecedents it was not possible to decisively split them into idea generation or idea development/implementation. The 'assessment' and 'annual team target' were focused on the entire EDI process within the organizations. It may therefore not have been possible to associate these HR-practices with a specific EDI phase. These two factors in combination with 'monetary reward' seem to be able to facilitate the participation of work-floor employees by two

mechanisms: experiencing an expectation and stimulating motivation. Training courses seem to affect the mechanisms ability and motivation. Depending on the focus of the course this will positively influence the participation in idea generation, idea development/implementation, or both. The same applies to 'task composition', it depends on what is expected of an employee in a job description. Including idea generation in 'task composition' seems to create an expectation that employees should participate in this phase. As a result, this mechanism facilitates participation of work-floor employees. On the other hand, when idea development/implementation is not included in 'task composition' employees might become demotivated which turns out into a lesser participation. COVID-19 causes work-floor employees to experience impossibilities to participate in EDI. Next to this direct influence on the experience of work-floor employees, COVID-19 indirectly influences participation by negatively affecting other antecedents. The factors that fall under organizational context and process related factors seem to foremost stimulate the mechanism opportunity for work-floor employees to participate. For instance, 'organizational support', 'innovative culture', and 'fixed moment of attention' ensure that employees feel that they have the opportunity to participate in EDI, which facilitates participation. In addition, 'organizational support' seems to ensure an expectation of employees to participate, and 'innovative culture' appears to create willingness among work-floor employees. However, when employees perceive 'no organizational support' and 'no fixed moment of attention', this inhibits participation in EDI because they experience the mechanism impossibilities.

4.2.2. Antecedents affecting participation in idea generation

The most important factors to idea generation seem to be 'supportive supervision', 'feedback', 'intrinsic motivation of work-floor employees', and 'feeling that nothing is done'. Next to that, 'non-monetary appreciation' and 'physical suggestion board' have an influence on the participation of work-floor employees in idea generation.

Managerial behavior

Supportive supervision

The presence of 'supportive supervision' has been identified at every company as an important factor for increased participation in idea generation. Almost every interviewee discussed the support of their manager to be facilitating for work-floor employee participation in idea generation. For instance, managers seem to motivate work-floor employees to participate in idea generation by stimulating employees to come with ideas and ask critical questions. Thus, 'supportive supervision' seems to increase the mechanisms motivation and ability of employees, which leads to an enhanced participation in idea generation. On the contrary, 'no supportive supervision' seems to inhibit participation of work-floor employees in idea generation. Employees from Machine Inc. perceive that getting no support from their manager makes it difficult to work on continuous improvement. Moreover, they point out that when a manager is not able to give guidance, little will happen. An interviewee from Construction Inc. indicates that if a manager does not have a motivating role, it will be demotivating. When work-floor employees do not hear from the manager, they will be able to hide behind this and will not pay attention

to continuous improvement. Therefore, it can be stated that 'no supportive supervision' leads to the mechanism's demotivation and inability of employees, which, in turn, leads to less participation in idea generation. Hence, the way in which managers view continuous improvement and how they deal with it is important. This is because, in most cases, managers are the ones that give work-floor employees resources to work on continuous improvement. *"I am of course for the ins and outs within my team, so in the end I can determine what a day start is about, how much time we spend discussing improvement ideas, how much time employees are given to further develop an improvement idea or to participate in yes in consultation to realize things. I can organize support form yes reporting clubs or from a central project leaders club or from a process expert. So, I can help the employee in various ways, so to say to get the improvement idea more concrete, sharper, and blended and realized."* – CAMA01. Moreover, this makes clear that the role of a manager is very important for the participation of employees in EDI.

Feedback

'Feedback' on improvement suggestions seems to influence idea generation both positively and negatively. If work-floor employees receive feedback, this is perceived as positive. On the other hand, when work-floor employees do not receive feedback, this is perceived as negative. Except for Machine Inc, employees from all organizations mention getting feedback on ideas. According to interviewees from SocialSecure Inc. feedback ensures that employees feel taken seriously. This keeps employees motivated to come up with ideas. Furthermore, through constructive feedback, work-floor employees can improve their current idea and continue to participate in idea generation. Thus, the mechanisms supporting work-floor employee participation in this case are motivation and ability. The same applies to Energy Inc., where work-floor employees mention that it is important to receive feedback to know how to modify the initial idea so that it can be executed, or whether the idea might be implemented later. At Construction Inc. a manager also indicated that it is very important for idea generation to provide feedback on an idea. Not every idea can be developed and implemented. However, to maintain the motivation of work-floor employees to generate ideas, it seems necessary to provide constructive feedback.

While 'getting feedback' can increase participation of work-floor employees, 'getting no feedback' can cause employees to come up with fewer or no new ideas. At Machine Inc. this seems an important reason why employees participate less in idea generation. Since they work with an improvement team, interviewed work-floor employees and managers indicate that they expect a response if they registered an idea in the online suggestion system. Interviewees from the improvement team mention they are aware that they are lacking on this and acknowledge that it is important to provide work-floor employees with feedback. Moreover, it is mentioned that if work-floor employees do not receive motivated feedback on why an idea is not going to be implemented, they probably will not come up with a new idea in the future. *"But to say that immediately, 'I immediately reject', no. See if it is rejected, then it is really motivated. (…). But you have to defend that properly. Because otherwise you just know if you say 'no, we won't'. Yes, then you should not expect that person to say, 'okay I have an*

idea' next time." – BAAMA02. This statement is confirmed by SocialSecure Inc. and Energy Inc. Without feedback work-floor employees feel that they cannot modify their initial idea properly. The associated mechanism is inability. Therefore, they just do nothing with it. In sum, getting feedback makes employees feel taken seriously, gives them tools to modify their idea and keeps employees motivated, which facilitates participation of work-floor employees in idea generation. Conversely, not receiving feedback decreases the ability of employees to modify their idea and they become demotivated to generate new ideas. Thus, resulting in less or no participation in idea generation.

Non-monetary appreciation

'Non-monetary appreciation' seems to have an effect on idea generation as well as on idea development/ implementation. At Energy Inc. and Construction Inc. they experience 'non-monetary appreciation' as facilitating for participation of work-floor employees in idea development and implementation. This is further explained in section 4.3.3. For now, we will focus on the effect on idea generation. Employees from SocialSecure Inc. and Machine Inc. foremost experience non-monetary appreciation to stimulate their participation in idea generation. According to employees, appreciation can be demonstrated by acknowledging the idea originator, small gifts and words of appreciation. These forms of appreciation are given to employees after their idea has been successfully implemented. Because of this, it may be seen as motivation for work-floor employees to come up with a new idea. Therefore, the moment at which appreciation is given can determine the phase on which the factor has an effect. In this case, 'non-monetary appreciation' after a successful implemented idea keeps employees motivated to generate a new idea. So, by stimulating the mechanism motivation, participation of work-floor employees will be facilitated. However, a limitation occurs to this influence. Before 'non-monetary appreciation' is given to employees, it is necessary that employees have already participated in a phase of EDI. Hence, 'non-monetary appreciation' mainly ensures that employees stay motivated to participate and only affects work-floor employee participation of employees who have already participated.

Employee characteristics

Intrinsic motivation of work-floor employees

The 'intrinsic motivation' of work-floor employees seems to be an important factor for a higher participation in idea generation. Work-floor employees who are intrinsically motivated, indicate to participate in idea generation from their internal motivation. These employees often find it interesting to continuously improve their work circumstances and are open to change. So, the mechanisms ensuring participation in idea generation is willingness of work-floor employees. Except for Construction Inc, 'intrinsic motivation' is mentioned at every organization. Every work-floor employee that we spoke appointed their own motivation as one of the factors why they participate in idea generation. However, managers mentioned that there are also some employees who are not intrinsically motivated to generate ideas. When work-floor employees are not intrinsically motivated to generate ideas, this results in a lesser participation in idea generation. In most cases, it is hard to involve these employees in continuous improvement because they resist to get started with continuous improvement. It can be said that in this

case the mechanism is unwillingness. According to managers, there are different groups of employees with different motivations considering continuous improvement. Employees who are really motivated to generate ideas, do not need help to come up with ideas. Then you have a middle group where employees are still motivated, but need help from, for example, the manager or other employees (i.e., linked with supportive supervision, cooperation). Lastly, there is a group who really is not intrinsically motivated to participate in idea generation. Managers indicate having the feeling that it is very difficult to get this group involved. Therefore, it can be stated that work-floor employees with 'no intrinsic motivation' will hardly or not participate in idea generation because they are unwilling to do so. On the other hand, if work-floor employees are intrinsically motivated, this ensures willingness of employees and is one of the most important factors to facilitate participation in idea generation.

Process-related

Feeling that nothing is done

When work-floor employees experience that 'nothing is done' with their ideas it seems that this can inhibit the participation of those employees in idea generation. At all four companies, interviewees mentioned this factor as an inhibiting factor. At SocialSecure Inc. and Construction Inc. it is discussed by managers. They stated that when employees experience that nothing is done with their idea, their willingness to participate in idea generation will become less. There are no work-floor employees at those two companies who addressed that they have the feeling that nothing is done with ideas. However, this is the case with Machine Inc. and Energy Inc., work-floor employees experience that nothing is done with many ideas. According to those work-floor employees, they come up with fewer or no ideas. Interviewees mention that this feeling causes that work-floor employees not even communicate new ideas during a specially designed moment for continuous improvement. *"He just thinks that nothing will be done with it, I think. There's no point in saying it. So, yes then you can quickly get back to work, so those week starts pass quickly."* – BAAWEV04. The feeling that nothing is done with ideas does not seem to directly result in employees having fewer ideas. However, they hardly, if at all, communicate new ideas. Therefore, it can be stated that the 'feeling that nothing is done' with ideas causes unwillingness, which in turn leads to less participation of work-floor employees in idea generation.

Physical suggestion board

A 'physical suggestion board' in addition to an online suggestion system appears to have a positive influence on the participation of work-floor employees in idea generation. In 2019, Energy Inc. worked with such a suggestion board. They experienced that it lowered barriers to suggest ideas and that it creates interaction about ideas between employees. The underlying mechanism that ensures that participation is enhanced is increasing opportunities. In combination with the 'annual team target', it has made continuous improvement really come to life within the departments according to an interviewee. Similarly, Construction Inc. has introduced a physical suggestion board within the company on which employees can write their ideas at all times. Because employees have to work at home a lot due to COVID-19, it has not been used very much yet. It is expected this will happen once

employees return to work at the office. At SocialSecure Inc. and Machine Inc. interviewees note that they think that introducing a physical suggestion board will help employees to come up with suggestions. It is mentioned that the online suggestion system cannot be used by every employee due to the complexity of the system. Therefore, a physical suggestion board can be seen as a supportive means which creates opportunities for employees to participate in idea generation. It lowers the threshold to indicate an idea and, therefore, creates an easier opportunity to participate in idea generation.

Conclusion antecedents affecting participation in idea generation

In sum, the clusters affecting work-floor employee participation in idea generation are managerial behavior, employee characteristics and process-related factors. The role of the manager appears to have an important influence on work-floor employee participation in idea generation. The factors 'supportive supervision' and 'feedback' seem to both positively and negatively affect the same mechanisms, namely motivation and ability. When employees perceive 'supportive supervision' and 'feedback' this stimulates their motivation and ability which facilitates participation in idea generation. On the other hand, if 'no supportive supervision' and 'no feedback' are gained, work-floor employees seem to experience demotivation and inability which prohibits them from participating in idea generation. Moreover, 'non-monetary appreciation' ensures employees to stay motivated to participate in idea generation. A condition for this effect is that employees have already participated in EDI. This is because work-floor employees receive appreciation for prior improvements. In addition, work-floor employees who are 'intrinsically motivated' experience the mechanisms willingness and motivation which makes them participate in idea generation. However, if employees are 'not intrinsically motivated', this means that they are more unwilling to participate, which seems to prevent them from participating in idea generation. Lastly, two factors that are process-related have an influence on participation in idea generation. When work-floor employees experience that 'nothing is done with ideas' they will get unwilling to communicate new ideas. Therefore, it can be said that the feeling of employees that 'nothing is done' negatively effects employee participation in idea generation with the mechanism unwillingness. The presence of a 'physical suggestion board' in addition to the online suggestion system lowers the barrier for employees to participate. As a result, work-floor employees experience that there are more opportunities which positively influences participation in idea generation.

4.2.3. Antecedents affecting participation in idea development/implementation

The two factors that seems to have the largest effect on idea development/implementation are 'time' and 'dependencies'. Moreover, the other antecedents discussed to influence idea development/ implementation are 'limited budget', 'cooperation', 'supportive supervision', 'non-monetary appreciation', 'intrinsic motivation of work-floor employees', 'seeing result', 'type of suggestion', and 'improvement team'.

Resources

Time

One of the most experienced obstacles to participate in idea development/implementation seems to be 'having no time'. Since EDI is usually seen as an additional activity, work-floor employees often experience that they have no time to work on idea development/implementation. Employees from all four organizations indicate experiencing 'having no time'. Especially at Machine Inc. and Energy Inc., employees note that primary work tasks take precedence over continuous improvement. If, for example, a product must be completed quickly, or there are many customers who need service, employees address they experience that there is no time to work on continuous improvement. In this case, the execution of ideas is suspended, and in some cases, ideas are no longer implemented at all. As a result, work-floor employees experience less opportunities to participate in idea development/implementation. In other words, the underlying mechanism which causes a lower participation is experiencing impossibilities. There are several factors that cause employees to experience that they do not have time for continuous improvement. First, an employee with a high workload often seems to perceive that there is no time. Particularly, when primary tasks remain undone, it becomes difficult to participate in continuous improvement. Second, employee turnover causes work backlogs, not enough capacities, and training of new employees. Some managers mention that sometimes the perception of 'having no time' depends on the experience of the employees and does not necessarily have to be the case. *"Honestly, I think it is not that experienced by the employees. At the same time, I also think that a lot of employees cause that themselves. Hey because they kind of assume that it's busy, so I just have to work hard."* – CAMA01. So, it seems that the employee's feeling about not having time is key. It can be stated that when work-floor employees experience 'having no time' to work on continuous improvement this causes employees to experience impossibilities which decreases participation in idea development/implementation.

On the contrary, some employees do experience 'having time' to work on continuous improvement. For example, a work-floor employee from SocialSecure Inc. mentions: *"Well, with us that is relatively easy, because we have improved and digitized so much, we just have some time on a weekly basis to make time for that, as it were."* – ABWE04. So, because the team of this employee already improved some processes, they have more time, and thus experience more opportunities to work on continuous improvement. In addition, a manager from Energy Inc. points out that when employees experience that time is available so that they can execute an idea, this has a stimulating effect on the participation in idea development/implementation. Therefore, it seems that by creating time and giving work-floor employees the impression that they can work on continuous improvement, the participation in idea development/implementation can be facilitated.

Limited budget

A limited budget seems to have a negative effect on participation of work-floor employees in idea development/implementation. The moment there is no budget for a particular improvement, this ensures that the idea is not implemented. This has a direct effect on participation because when this happens the participation of an employee in the development and implementation directly ends. In addition, it can result in work-floor employees to be demotivated to participate in EDI. Interviewees indicate employees

become demotivated because management concluded that there is no budget, whilst an idea initiator feels that it is a good idea. So, a 'limited budget' can inhibit work-floor employee participation by the mechanisms of ending the process and by reducing the motivation to put more effort in it. The last is related to the factor 'feedback'. When work-floor employees receive proper feedback why the there is no budget to implement the idea, it will be less demotivating.

Organizational context

Dependencies

When work-floor employees experience that they are depending on others within the organization, they seem to experience that the successful completion of an idea becomes more difficult. Within Machine Inc., for example, employees address they mostly dependent on employees from other departments. They experience that when an idea is sent to another department, usually no action is taken. As a result, the idea is not further developed or implemented. This makes it impossible for employees to still participate in the idea development/implementation. Thus, the mechanism which causes a negative influence on work-floor employee participation is experiencing impossibilities. Moreover, it seems that especially when the IT-department is needed it becomes difficult to participate in EDI. Within Energy Inc. and SocialSecure Inc. interviewees point out that the IT-department has limited capacity. As a result, many ideas are put on hold. It appears to be demotivating for employees when this happens. Moreover, most employees do not have the skills to stay involved when an idea has to be sent for development and implementation to the IT-department. Thus, this results in no work-floor employee participation in idea development/implementation. Additionally, employees experience that when other employees are needed, especially from other teams, they have to deal with their work schedule. This ensures the process is difficult and slow. Next to experiencing impossibilities, work-floor employees also seem to experience inabilities and demotivation. Work-floor employee participation can be hindered by 'dependencies' in two ways. Firstly, it is no longer possible to participate because another department takes over the idea completely. Secondly, participation in idea development/implementation can be made more difficult because it is difficult to cooperate with others. This relates to 'cooperation', which is addressed in the following paragraph.

Cooperation

In contrast with 'dependencies', 'cooperation' appears to have a stimulating effect on participation of work-floor employees in idea development/implementation. As soon as there is 'good cooperation', participation in the idea development/implementation is stimulated. Foremost, interviewees note when the development and implementation of an idea stays in one team, the collaboration between employees is easy, and participation is increased. The threshold to participate is lower, which creates opportunities. Cooperation can help facilitate participation in several ways. During collaboration, work-floor employees can support each other in such a way that they can combine their skills. In addition, employees can become motivated to participate in development because other employees also contribute. So, there are three underlying mechanisms supporting participation in idea development/

implementation, namely experiencing opportunities, abilities, and motivation. According to an employee, having an open and innovative culture facilitates collaboration between employees of different teams. Therefore, 'innovative culture' is related to 'cooperation'. To enhance participation in idea development/ implementation it is important to facilitate good cooperation.

Managerial behavior

Supportive supervision

The influence of 'supportive supervision' is most applicable to idea generation. But it also seems to have an effect on idea development/implementation. At all organizations work-floor employees point out 'supportive supervision' has a facilitating effect on idea development/implementation. Whereas stimulation to participate mostly affects idea generation, guidance of a manager seems to stimulate participation of work-floor employees in idea development/implementation. So, this is mainly about ensuring that employees have the ability to participate in idea development/implementation. Where the motivation mechanism is mostly affected by supportive supervision in case of idea generation, the ability mechanism is mostly influenced by supportive supervision in case of idea development/implementation. Interviewees from the HR-department also cited this as an influential factor. *"I think it is also a belief in one's own abilities. So, if you think 'oh I have a good idea, but I am not sure if I can do it', that a manager supports you in that and says 'well, I think you can or just try it and you look how far you go coming. May you fail too'."* – CDHR01. So, when managers ensure that work-floor employees experience they have the skills to develop and implement an idea, it seems they will participate more.

Non-monetary appreciation

In section 4.2.2., we discussed the effect of 'non-monetary appreciation' on participation in idea generation. Moreover, 'non-monetary appreciation' also appears to have an influence on participation of work-floor employees in idea development/implementation. At Energy Inc. employees experience appreciation of both managers and the management. From the management, successful ideas are mentioned in the communication (e.g., newsletter) by the company. In addition, successes are celebrated with a treat. According to work-floor employees, these ways of appreciation ensure that they are or remain motivated to participate. So, the mechanism that causes work-floor employees to participate is the experiencing motivation. At Construction Inc., EDI through an online suggestion system is still being implemented. To ensure that employees become enthusiastic and want to participate in idea development and implementation, they have introduced different ways of appreciation. For example, they introduced an 'improvement of the month'. For this purpose, the best improvement is selected monthly and communicated in the newsletter. So, the organizations devise ways to increase the motivation of employees participating in idea development/implementation.

Employee attitude

Intrinsic motivation of work-floor employees

'Intrinsic motivation' has more effect on idea generation, but also has an influence on idea development/implementation. In contrast to the influence of this factor on idea generation, only the

positive influence is mentioned by interviewees here. This could be because employees who are not already motivated to come up with an idea, do not get further in the process of EDI. Overall, work-floor employees who are intrinsically motivated to work on continuous improvement are also motivated to develop and implement their ideas. For example, some work-floor employees point out that they like to improve processes by making them more efficient. Intrinsically motivated work-floor employees are willing to participate in idea development/implementation. Their willingness to participate is the reason that they participate more. Therefore, intrinsically motivated employees will participate more compared to employees who are not intrinsically motivated. Moreover, intrinsically motivated work-floor employees seem to need fewer other factors to stay motivated to work on idea development/ implementation.

Process-related

Seeing result

'Seeing result' appears to work stimulating for work-floor employees to participate in continuous improvement. Employees from, for example, SocialSecure Inc., Energy Inc., and Construction Inc. point out that the payoff from implemented ideas provides motivation to implement more ideas, especially when it makes their work easier. This provides motivation for future participation in idea development/ implementation. At Machine Inc. employees state that seeing ideas being implemented in general would stimulate their participation in idea development/implementation. This may be because employees in this organization experience that very few ideas are developed and implemented (as discussed before in the paragraph 'feeling that nothing is done'). This mainly hinders their participation at the moment. Since this is the opposite of seeing ideas being implemented, they may expect that if they do see ideas being implemented, they may want to participate in EDI again. Foremost, 'seeing result' as in seeing the payoff of an implemented idea seems to result in more participate of work-floor employees in idea development/implementation by stimulating the mechanism motivation from employees to participate.

Type of suggestion

The 'type of suggestion' mainly seems to have an effect on idea development/implementation. This is probably because the level of difficulty does not matter for idea generation but does matter for the execution of it. Two types of suggestions were identified during interviews, namely easy and difficult suggestions. To develop and implement 'easy suggestions', work-floor employees do not need any special skills. Therefore, they seem to experience that it is possible for them to develop and implement easy suggestions. Employees from all four organizations experience that those easy suggestions make it possible for employees to participate in idea development/implementation. So, work-floor employees experience opportunities and the ability to participate. Some interviewees from Energy Inc. mention that a lot of easy ideas could be fixed in the first year of EDI through an online suggestion system. *"Well, I must say the Coimbee there we are last year we started. And for energy and also the improvements that poured in. Because it was still accessible at the time, because then you also have the small things that can be adjusted. You know, put a trash can here because that is more convenient, (…). What I did notice*

is that we have had improvements again this year. But they are getting bigger, so just say that low threshold from last year that you just don't have anymore. (...). So, it is used less than last year." – CCMA03. This might be an explanation for a lower participation in the second year. Moreover, difficult suggestions appear to inhibit the participation of work-floor employees in idea development/ implementation by limiting the opportunities of employees. Often, specialized employees or a specialized department are needed to execute this phase. Therefore, it can be stated that in case of a difficult idea work-floor employees are depending on others. Thus, a difficult suggestion is related with the factor 'dependencies', which is discussed earlier. In some cases, work-floor employees are still able to participate in the development and implementation. However, this is a lot harder compared to an easy idea. So, it seems that a 'difficult suggestion' inhibits the participation of employees in idea development/implementation by decreasing the opportunity of employees to participate. In addition, work-floor employees lack the skills to perform this phase. Thus, the mechanisms associated with a 'difficult suggestion' are experiencing impossibilities and inabilities.

Improvement team

The introduction of an 'improvement team' at Machine Inc. appears to have both a positive and negative effect on work-floor employee participation in idea development/implementation. The improvement team assumes a leading and guiding role, in which they involve employees in this phase. Work-floor employees who are affected by the improvement are therefore, involved in the development and implementation of ideas. On the other hand, the presence of the improvement team also creates resistance among some work-floor employees. Working with an improvement team comes with structural meetings about continuous improvement. Work-floor employees cite that they think that it is not necessary to have all these meetings. *"I'm like it's all a bit, yes, it's not necessarily needed. I am more of no bullshit and just do it. Yes, I have something like that, if there is an idea, then I better do it right away or implement it and not yes collect all of them and meet another ten times about it. If so, none of that will make any progress."* – BAAWEV04. Work-floor employees seem to think that it is unnecessary to execute improvements in this way. Hence, work-floor employees participate less in idea development/implementation. While the positive experience facilitates employees to participate through increased motivation, the negative experience creates unwillingness which inhibits participation.

Conclusion antecedents affecting participation in idea development/implementation

Concluding, the resources 'having no time' and 'limited budget' seem to negatively affect participation of work-floor employees in idea development/implementation. Whereas, perceiving 'having no time' to work on continuous improvement causes employees to experience the mechanism impossibilities, 'limited budget' creates demotivation amongst employees. Both mechanisms are negatively related to the participation of work-floor employees in idea development/implementation. However, when work-floor employees perceive 'having time' to work on continuous improvement employees experience opportunities to participate which facilitates their participation. Moreover, the mechanisms underlying 'dependencies' are experiencing impossibilities, inabilities, and demotivation. All these mechanisms

seem to negatively affect work-floor employee participation. While 'dependencies' inhibit participation, 'cooperation' stimulates participation. The opposite mechanisms logically apply to this factor: experiencing possibilities, abilities, and motivation. Furthermore, 'supportive supervision' in this phase seems to stimulate the ability of work-floor employees. Experiencing this mechanism facilitates participation. Furthermore, 'non-monetary appreciation' and 'seeing result' both seem to stimulate the motivation of work-floor employees. When employees experience the mechanism motivation, this seems to facilitate their participation. If work-floor employees perceive themselves as 'intrinsically motivated' this stimulates the mechanism willingness which ensures participation in idea development/ implementation. A 'difficult suggestion' can make employees experience the mechanisms inabilities and impossibilities, which give work-floor employees the feeling that they cannot participate in idea development/implementation. On the other hand, 'easy suggestions' causes work-floor employees to experience the mechanisms abilities and opportunities. So, whereas 'difficult suggestions' seem to negatively affect participation, 'easy suggestions' positively affect participation. Lastly, the presence of an 'improvement team' seems to have a both negatively and positively influence. In the negative case an 'improvement team' can cause unwillingness and in the positive case work-floor employees experience being motivated.

4.2.4. Antecedents affecting participation in online suggestion system

Besides factors influencing participation in EDI, there are also some antecedents found that are related to participation in the online suggestion system of Coimbee. These factors seem to specifically influence the participation of work-floor employees in Coimbee and not necessarily the participation in EDI. Table 8 illustrates an overview of all antecedents that affect participation of work-floor employees in an online suggestion system per organization. A more detailed description of these antecedents is included in Appendix III. The most important factors are 'functionalities' and 'promotion of the system'. Moreover, 'change of manager', 'many different systems present', 'limited accessibility', and 'improvement team' seem to influence the participation.

Table 8: Overview antecedents affecting participation in online suggestion system.

	Participation in online suggestion system			
Company / **Antecedent**	**1**	**2**	**3**	**4**
• Organizational context				
Change of manager	-			
Many different systems present	-	-	-	-
• System-related				
Limited accessibility	-	-	-	-
Functionalities: overview	+	+	+	+
Functionalities: high difficulty	--	-	--	
• Process-related				
Presence of improvement team		-		
Promotion of system	+	+	+	+
No promotion of system	--		--	-

Note. 1 = SocialSecure Inc.; 2 = Machine Inc.; 3 = Energy Inc.; 4 = Construction Inc.
++ = very positive effect; + = positive effect; 0 = neutral effect; - = negative effect; -- = very negative effect

Organizational context

Change of manager

SocialSecure Inc. has experienced that when a new manager joined a team, less or no use was made of the online suggestion system of Coimbee. The underlying reason is that the online suggestion system does not seem to be completely indoctrinated within the organization. For instance, it turned out that not everyone had access to Coimbee, and employees made limited use of the system. *"Yes, that is firstly because I am completely unfamiliar with it. I have it myself and I have not been indoctrinated to use it. (...) And my team yes, it is also not the case that you are taken along in a flow in which the team made a lot of use of it."* – AAMA01. In addition, managers were not obliged to work with Coimbee. As a result, they experience no expectations from the organization. Therefore, participation in the online suggestion system is inhibited. Moreover, as Coimbee was perceived as complex to work with, managers indicated they have looked for other ways to register EDI. They work, for example, with Trello and Microsoft 365.

Number of systems present in the organization

According to interviewees, another reason that causes them to make less use of the online suggestion system is the presence of many different systems within the organization. SocialSecure Inc. regularly changes the internally used systems, causing employees to adopt a wait-and-see attitude. They first want to see whether the systems are really going to be used within the organization. Moreover, employees from Energy Inc. mention that they are using multiple systems with separate login credentials, making the total amount of actions and systems too much. This results in work-floor employees who do not want to work with an online suggestion system. So, when employees perceive that there are too many systems within an organization this inhibits participation in such a system. Interviewees explain that when the online suggestion system was introduced within Construction Inc. there were some employees who showed resistance. According to an employee, this was because there are already quite a lot of systems and because it is something new. Moreover, no work-floor employee from Machine Inc. spoke about the number of systems present in the organization. Only the interviewee from HR mentioned that they already work with a lot of different systems. It was not possible to integrate those systems with Coimbee. The interviewee indicates that this is one of the reasons that prevents employees from using Coimbee. When work-floor employees experience that there are too many systems this results in unwillingness which inhibits participation in the online suggestion system.

System-related

Limited accessibility

'Limited accessibility' of Coimbee is one of the reasons cited by all four companies that seems to decrease participation in the online suggestion system. Limited accessibility of the online suggestion can be divided into three inhibiting factors. First, not everyone within the organizations is able to login to the online suggestion system. Second, Coimbee is a separate tool which needs separate login credentials. Third, some employees do not have access to a computer. The first is experienced by all

four organizations. At no company all employees have access to Coimbee. At Energy Inc. most employees do have access. However, it is not created by default for new employees. Interviewees mentioned that most employees who entered the past year do not have access. Work-floor employees point out that it is difficult to work with Coimbee when others have no insight. For work-floor employees who do not have access to Coimbee at all, it is impossible to participate in the online suggestion system. Furthermore, it seems more difficult for employees who do have access to go through the entire EDI process in Coimbee when there are employees who do not have access. The second factor, having separate login credentials, is called an inhibiting factor to participate in Coimbee by SocialSecure Inc. and Energy Inc. They would prefer to see the online suggestion system as an internal system for which it is not necessary to go to a separate webpage and have separate login credentials. This factor causes employees to forget about the online suggestion system because they do not encounter it daily. Lastly, at Machine Inc. and Construction Inc., many work-floor employees whose input seems to be very important but who do not have access to a computer during work. As a result, another way is sought to involve these employees in EDI at Construction Inc., for example, by visiting them to collect ideas. At Machine Inc. there are some employees who have access to Coimbee via their telephone. However, they indicate that this does not work well and that they therefore make little use of the online suggestion system. Thus, the limited accessibility of Coimbee cause difficulties for work-floor employees, making it extremely hard for some to participate at all. For others who do have access, the fact that others do not have access makes it more difficult to work with it and consequently this lowers their willingness to participate. Thus, it seems that the mechanisms inability and unwillingness of work-floor employees negatively affects participation in an online suggestion system.

Functionalities of Coimbee

Coimbee brings along various functionalities. There are some functionalities which are perceived as positive by work-floor employees and makes them want to use the online suggestion system. However, there are also some functionalities which cause employees to be less willing and able to participate in the online suggestion system. To start with the positive functionalities, the overview and structure that Coimbee provides is mentioned by almost every interviewee as making it convenient for them to use the online suggestion system. It increases the willingness of employees to participate in the online suggestion system. On the other hand, interviewees from SocialSecure Inc., Machine Inc., and Energy Inc. point out that Coimbee is a relatively difficult and unclear system to work with. Interviewees from Construction Inc. mention that they are used to work with a more complex and difficult system. *"And what also plays a role is that not everyone wants to work in that, well, it is difficult, complex file Relatics. But that management is now somewhat focused on improvements. So, then they soon go to Coimbee."* – DWES01. Therefore, they might not experience Coimbee as a difficult and unclear system. Because the other companies perceive Coimbee as a relatively difficult and unclear system, their willingness to participate in Coimbee is lower. In sum, where the positively experienced functionalities ensure that

work-floor employees are able and willing to participate, the negatively experienced functionalities cause inability and unwillingness to prevent participation in the online suggestion system.

Process-related

Presence of improvement team

As explained in section 4.1.2., Machine Inc. chose to appoint a special improvement team to introduce EDI through an online suggestion system in the organization. This seemed to bring benefits. However, it also seems to generate resistance of employees to work with Coimbee. Employees believe that they do not need a special improvement team to engage in continuous improvement. That is why some do not cooperate in Coimbee but arrange improvements outside Coimbee. So, the 'presence of an improvement team' ensures unwillingness of employees which inhibits participation in an online suggestion system.

Promotion of the online suggestion system

Employees from all organizations experience that it is useful for the participation in an online suggestion system to have someone that promotes the online suggestion system. A promotor can ensure that employees are aware of the presence of the online suggestion system and motivate employees to use it. Interviewees point out that it is especially important to have a promotor during the implementation of such an online suggestion system. At Energy Inc. they had a promotor during the first year of the online suggestion system. Now they no longer use a promotor, they name it as one of the reasons why there is less attention on using the online suggestion system. Having someone promoting the suggestion system seems to create an expectation that employees should participate, which facilitates the participation in an online suggestion system. On the other hand, not having someone promote the online suggestion appears to weaken the expectation which inhibits the participation in an online suggestion system. Due to the presence of a promotor, a certain attention is given to the system which creates an expectation. Interviewees mentioned that it is important to pay attention to the online suggestion system so that it does not get lost of sight. Therefore, it can be stated that 'having someone promote the online suggestion system' ensures that work-floor employees experience an expectation that they should participate, which seems to result in a higher participation in the online suggestion system. On the other hand, 'not having someone promote the online suggestion' causes the opposite effect.

Conclusion antecedents affecting participation in online suggestion system

There are several factors that seem to determine work-floor employee participation in the online suggestion system. A 'change of manager' can result in the experience that there is no expectation to use the system which inhibits the participation in the online suggestion system. The mechanisms underlying 'many different systems', 'limited accessibility', and 'functionalities: high difficulty' are experiencing inability and unwillingness. Because work-floor employees experience these mechanisms, this inhibits their participation in the online suggestion system. In some cases, employees perceive positive sides of the functionalities of Coimbee. If that is the case, this will increase the willingness of work-floor employees to work with the online suggestion system. Next, the 'presence of an

improvement team' seems to cause that work-floor employees experience the mechanism unwillingness to use the online suggestion system. As a result, they arrange improvements outside the online suggestion system. Lastly, while 'having someone promote the online suggestion system' creates an expectation and hence facilitates participation in the online suggestion system, 'not having someone promote the online suggestion system' seems to have the opposite effect.

4.3. Towards a framework of facilitators and inhibitors of work-floor employee participation in EDI through an online suggestion system

In the framework, the clusters, including most important antecedents, affecting the participation of employees in EDI through an online suggestion system are illustrated (Figure 5). All these antecedents influence the employees' experience. There seem to be five mechanisms which work-floor employees can experience both positively and negatively. The positive sides of these mechanisms are ability, motivation, opportunity, willingness, and expectation. On the other hand, the negative sides of the mechanisms are inability, demotivation, impossibility, unwillingness, and no expectation. When work-floor employees experience the positive sides as a result of the antecedents, this will facilitate their participation in EDI through the online suggestion system and vice versa. There are several clusters that seem to have more effect on a particular EDI phase. For example, the HR-practices influence the entire EDI process. This seems to be due to the focus of the factors. For instance, when the factors are specifically focused on idea generation, this has more effect on this phase. The external context and organizational context also mainly influence the entire EDI process. Except for dependencies and cooperation, which can be related specifically to idea development/implementation. Moreover, managerial behaviors and employee characteristics seem to have an effect mainly on idea generation. The effect of these clusters on idea development/implementation is less. System-related factors are specifically related to the usage of the online suggestion system. Furthermore, process-related factors can be related to both phases. Resources mainly affect idea development/implementation. In addition, organizational context and process-related factors also affect the specific use of the online suggestion system. No factor can be seen as a completely isolated factor. For instance, several factors influence other factors or are affected by other factors. It could be that different combinations of factors can increase or decrease participation through different mechanisms.

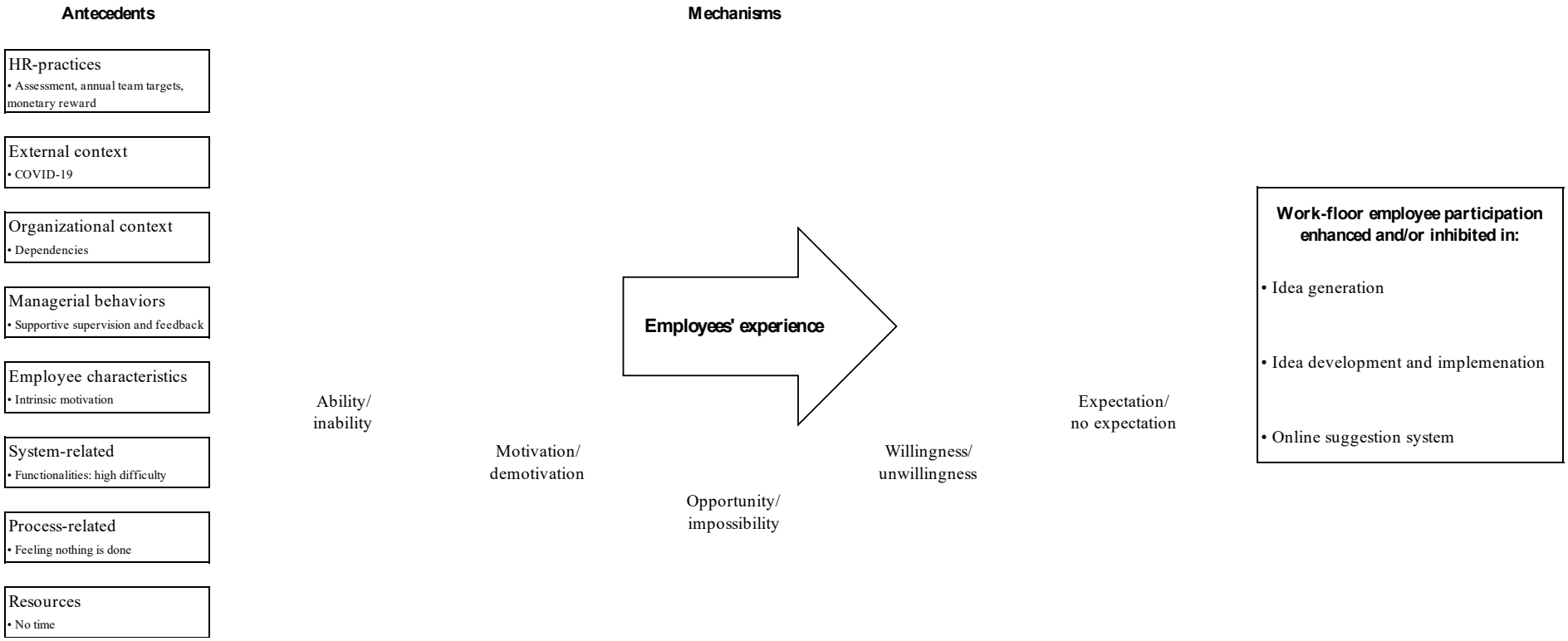

Figure 5: Framework of facilitators and inhibitors of work-floor employee participation in EDI through an online suggestion system.

5. Discussion

The aim of this research was to explore how HRM activities affect the participation of work-floor employees in EDI through an online suggestion system. We found that this participation is affected by five mechanisms with both a positive side and a negative side which can be seen as counterparts. The positive sides of the mechanisms are ability, motivation, opportunity, willingness, and expectation. Oppositely, the negative sides of the mechanisms are inability, demotivation, impossibilities, unwillingness, and no expectation. These mechanisms are linked to how work-floor employees experience the HRM activities. This finding corresponds to the attribution theory. According to attribution theory, attitudes and behavior of people arise from the interpretation and processing of social stimuli (Fiske & Taylor, as cited in Hewett, Shantz, Mundy, & Alfes, 2018). When work-floor employees experience the positive sides of the mechanisms as a result of the antecedents this seems to facilitate their participation in EDI through an online suggestion system. However, when employees experience the negative sides, this seems to inhibit their participation. The HRM activities can be divided into the following clusters: HR-practices, organizational context, managerial behavior, employee characteristics, system-related factors, process-related factors, and resources. In general, it seems that the level of participation in EDI is highest among the companies where employees experience the most positive and least negative factors. There seems to be no 'best practice' to facilitate participation. Once employees obtain a negative experience with continuous improvement, it turns out to be more difficult to get them to participate in EDI. This study has shown that the most influential positively experienced antecedents are 'assessment, annual team target, and monetary reward', 'supportive supervision' and 'intrinsic motivation'. Moreover, the most influential negatively experienced antecedents are 'dependencies', 'getting no feedback', 'feeling that nothing is done' and 'having no time'. In addition, there are two other notable findings. Firstly, the role of the HR-department seems missing. The HR-department turned out not to be involved in the EDI process and there appeared to be no HR-policy on innovation and the role of employees in this. However, typical HRM activities were executed by other members of the organization. Secondly, the online suggestion system seemed not fully integrated within the organizations. Not all employees appeared to have access to the online suggestion system or used the system. Two organizations also used other means for continuous improvement.

5.1. Theoretical implications

With regard to theoretical implications, this research adds five important contributions to the literature. First, within our research we found that the role of the HR-department within EDI through an online suggestion system is missing. HRM interviewees stated that they were not involved in continuous improvement through the online suggestion system, and most HRM employees were not familiar with the online suggestion system. According to Jørgensen, Laugen, and Boer (2007) literature indicates that companies are not aware of the importance of involving HR-departments in innovation. Moreover, organizations face challenges in aligning the HR strategy and business strategy. It often seems to happen

that there is a gap between these two strategies (Aklilu, 2020). This could explain why HR-departments are not involved in EDI through an online suggestion system. Current research indicates that HRM and innovation are positively linked (Bos-Nehles et al., 2017; Jiménez-Jiménez & Sanz-Valle, 2008; Seeck & Diehl, 2017; Shipton et al., 2006). As such, the lack of involvement of the HR-department in the policy of continuous improvement and the participation of work-floor employees in EDI through an online suggestion system was not expected. In general, HRM is concerned with the management of employees (Leede & Looise, 2015) and motivation of employees is one of the most important HRM topics. Since lack of motivation by employees to participate is a weakness of an online suggestion system (Fairbank & Williams, 2001), we made the assumption that HRM would play a role in motivating employees to participate. Another possible explanation for the absence and unawareness of the HR-department may be that the online suggestion system in most companies is implemented at the department level and not at the organizational level. At the only organization where the HRM employee was familiar with the online suggestion system, the system was implemented at organizational level. However, at this organization the HR-department was also not involved in the continuous improvement policy and participation of work-floor employees. Moreover, managers indicated that they themselves carry out HRM activities such as the assessment of employees. Nevertheless, all HR interviewees indicated that their role in EDI through the online suggestion system could be increased.

Second, not all work-floor employees seemed to participate in the online suggestion system. This is in line with the findings of Malhotra et al. (2019), who described that many employees refrain from participating in a suggestion system. During this study, a number of factors emerged as a result of which employees do not participate. This seems mainly due to antecedents within the clusters organizational context, system-related, and process-related. The antecedents in these clusters can affect employees because they might experience unwillingness, inability, and no expectation. In the positive case, employees experience the positive sides of the mechanisms (i.e., willingness, ability, and expectation). At none of the case study organizations all work-floor employees have access to the online suggestion system. This contradicts with the literature on suggestion systems which argues that every employee within the organization should be able to participate in the online suggestion system (Fairbank & Williams, 2001). Furthermore, Du Plessis, et al. (2008) argue that suggestion systems can lead to greater employee involvement in EDI. This cannot be confirmed by this study. In contrast, it seems that an online suggestion system can ensure that employees refrain from participation in it. Arif, Aburas, Al Kuwaiti, and Kulonda (2010) describe that a suggestion system that keeps usability in mind increases employee participation. We have found that several employees do not use the system due to its difficulty and lack of clarity in the system. So, it may be that if employees experience that the system is not usable, this has the opposite effect and ensures that employees make no or less use of the online suggestion system. Another explanation could be that the online suggestion systems are not fully integrated and are generally not part of the daily activities of work-floor employees. Scholars illustrate to ensure employee

involvement, online tools for EDI must be well-integrated into work routines (Backström, & Lindberg, 2019; Gressgård et al., 2014).

Nonetheless, work-floor employees tend to refrain from using the online suggestion system, they still participate in EDI. While the 'formalized system route' was our main purpose, many employees seem to use the 'organizational route' or 'project-initiative route' (Renkema et al., 2021). Thirdly, there seem to be several HRM activities facilitating or inhibiting this participation in EDI. Central to the degree of participation is the experience of work-floor employees of both the antecedents and mechanisms, which is in line with the attribution theory. According to Nishii, Lepak and Schneider (2008) an attitudinally and behavioral reaction of employees to HR-practices is based on the understanding employees have of why the organization implements HR-practices. In general, it seems that the organizations with the most positive and least negative experienced HRM activities obtain the highest participation of work-floor employees in EDI. This confirms the assumption that HRM can contribute to the participation of work-floor employees in EDI. In line with Amundsen et al. (2014), we were not able to select a best practice to facilitate work-floor employee participation in EDI through an online suggestion system. Within all four companies EDI is implemented differently and the online suggestion system is used in another way. It could be that different HRM activities can have the same effect depending on the context within organizations. This is in line with configurational theory, which argues that a whole can be understood from a systematic perspective and should be viewed as a pattern of connected elements (Fiss, Marx, & Cambré, 2013). Thus, it could be that if work-floor employees experience different HRM activities as positive, their participation in EDI is facilitated. On the other hand, it may also be the case that if employees experience different HRM activities as negative, this inhibits their participation. The main HRM activities that emerged during the study are: 'assessment, annual team target, monetary reward', 'dependencies', 'supportive supervision', 'getting no feedback', 'intrinsic motivation', 'feeling nothing is done', and 'having no time'.

Fourth, these HRM activities seem to contribute to the participation level of work-floor employees through five mechanisms that can be experienced both positively and negatively. The positive sides of these mechanisms are ability, motivation, opportunity, willingness, and expectation. Next, the negative sides are inability, demotivation, impossibility, unwillingness, and no expectation. The positive mechanisms ability, motivation, and opportunity are well-known mechanisms in HRM literature that are collectively referred to as the AMO-model (Bos-Nehles et al., 2017). This research adds two other positive mechanisms which seem important facilitators for participation. These mechanisms are willingness and expectation. Willingness refers to the attitude of work-floor employees towards continuous improvement. HRM activities that seem to influence this attitude positively make employees want to participate. Furthermore, there are HRM activities that ensure that work-floor employees experience an expectation that they have to participate in continuous improvement. When employees experience this expectation, it seems that they participate in EDI as a result. While existing research mainly focuses on positive relationships, this research shows that there are also negative

relationships. If work-floor employees experience the counterpart of the aforementioned positive mechanisms, this seems to inhibit participation. The AMO-model also seems to have a reverse working. For example, if work-floor employees experience no opportunities, but impossibilities, this will have a negative effect on participation in EDI. This also applies to ability (i.e., inability) and motivation (i.e., demotivation). Moreover, if the attitude towards continuous improvement of employees is influenced so that they become unwilling, this will also have a negative effect on participation in EDI. The same effect applies to experiencing no expectation. This experience will also ensure that work-floor employee participation is inhibited.

According to Du Plessis (2016) managers and the HR-department should provide support for employees to participate in EDI through an online suggestion system. Even though the role of the HR-department seems missing, the fifth theoretical implication of this research stresses the importance of the manager. Our research shows that, in addition to the line manager, this role can also be performed by members of an improvement team or special improvement employees within teams. Next to encouraging and providing support to employees, in many cases a manager has a decisive role. For example, a manager determines whether an idea is approved and whether an employee is given time to implement an idea. Supportive supervision emerged as one of the most important incentives to participate in idea generation. In addition, it also seems to have a stimulating effect on idea development/implementation. This is in line with the study of Backström and Lindberg (2019), Bos-Nehles, et al. (2017), and Veenendaal and Bondarouk (2015). Next to encouraging and supporting employees, managers can give feedback on improvement ideas. Giving constructive feedback is important to keep work-floor employees motivated (Buech et al., 2010; Du Plessis et al., 2008; Fairbank & Williams, 2001; Van Dijk & Van den Ende, 2002). It might be because employees do not receive proper feedback that they tend not to participate in EDI through the online suggestion system. Our research showed that when employees did not receive feedback on their ideas, this had a negative effect on their participation in idea generation. So, besides getting feedback can keep employees motivated, not getting feedback seems to cause employees to become demotivated. According to Leach, Stride, and Wood (2006) shows providing feedback that the online suggestion system is well run and therefore facilitates sustained participation. This may be a reason for the non-optimal use of the online suggestion system within the companies.

5.2. Practical implications

Organizations aiming to enhance participation of work-floor employees in EDI through an online suggestion system should focus on the following practical implications. First, the role of the manager appears to be important for the participation of work-floor employees. Therefore, companies desiring to facilitate work-floor employees' participation in EDI through an online suggestion system should focus on the role of the manager. We would advise to select a manager who is open for innovation and to support them being innovative. Since perception, interpretation, and feelings of employees are important and those can be influenced by managerial behavior, it may managers can positively influence

obstructive feelings of employees. It seems that once employees experience the continuous improvement process negatively, it is hard to turn this around. Through supportive supervision and constructive feedback, a manager could ensure that work-floor employees perceive the EDI process as positive and value adding. This would probably result in a higher motivation and willingness of work-floor employees to participate in the EDI phases and the online suggestion system.

Second, in addition to managerial behavior, characteristics of employees are essential. It seems important that work-floor employees are intrinsically motivated to participate in EDI. Therefore, including this criterion during the recruitment process may help to select employees who are open to innovation. This can be done by, for example, presenting innovative cases during the recruitment process. The results show that the interpretation of an employee of innovation is the basis. The moment a work-floor employee has a positive experience with innovation, this will make it easier to let this employee participate in innovation. Additionally, it seems that fewer other positive factors are needed to stimulate these employees. Third, it seems that organizations with more HR-practices related to innovation have a higher participation in EDI. So, we would advise undertaking activities that focus on continuous improvement through the online suggestion system. For example, by setting goals together with employees for the generation, development, and implementation of ideas. This can be done at employee level as well as team level. To stress on the use of the online suggestion system, you could say that the complete process needs to be visible in the online suggestion system. It was found that when continuous improvement was included in the 'assessment, annual team targets, and monetary reward' that the participation of work-floor employees is higher than when it was not included. It is possible that including continuous improvement in these HR-practices ensures that employees participate more.

Fourth, it seems to have a negative effect on participation in idea development/implementation if certain employees within a team are given the task of carrying out this part of the EDI process and others are not. It can prevent work-floor employees who have not been given this task to participate because they do not feel the opportunity to do so. For this reason, if organizations want all work-floor employees to participate in the entire process of continuous improvement, make sure that the task composition of all employees are equal regarding continuous improvement. Lastly, research has shown that the online suggestion systems are not fully implemented within the organizations. This prevents employees from participating in the online suggestion system. Important for the success of an online suggestion system is a successful implementation of the system. So, it is crucial for organizational success to properly integrate an online suggestion system so that it becomes part of the daily routine of employees. This research has not found a best practice of how this can be achieved.

5.3. Limitations and suggestions for future research

A fundamental limitation of the research is the context in which the data was gathered. The data was collected during the COVID-19 pandemic. Because of this, certain methodological actions had to be organized differently than desirable. As discussed in the method, the data collection took place online. This made it more difficult to get in touch with organizations and employees. For many optional

interviewees, it was not possible to do an interview due to the increasing work-load due to COVID-19. Ultimately, we were still able to hold many interviews with different organizations, departments and hierarchy levels. Intentionally, we would organize observations at the organizations. Unfortunately, it was not possible to arrange these observations. We did attend one meeting from a company. However, the usefulness of this observation was limited because it was online. For instance, the connection was lost several times and we saw a fixed image that made it difficult to observe the individual attendees. Additionally, COVID-19 seems to have a negative impact on many antecedents. As a result, the results may differ in other circumstances. The expectation is that a factor that is now experienced negatively not suddenly is experienced as positive, but that the degree of the effect might be experienced differently.

Furthermore, the information that could be acquired from the HR-departments was limited. We were not able to get much information because in most cases the HR-department was not familiar with the online suggestion system and the EDI process. However, the involvement of HR, as described earlier, is important for the success of an online suggestion system and the EDI process. It would be very interesting to study how the HR-department can be involved and how they can adopt various innovation-related HRM activities to support participation of work-floor employees. While HR-departments do not play a role within the EDI process through an online suggestion system, they recognized that it could certainly add value if they played a greater role in this process. Therefore, we would suggest for future research to study how the HR-department can be involved in EDI through an online suggestion system. Moreover, since organizational success appears to depend on successful integration of the online suggestion system, it would be valuable for future research to investigate whether there is a best way to implement an online suggestion system and maintain the usage. It is also possible to look at the roles of different stakeholders within companies, including the role of HRM.

Lastly, the context of organizations and the educational level of employees in relation to the participation in EDI might be interesting for future research. Two organizations were service-oriented, and two production-oriented. In addition, two organizations mainly employed employees with at least higher vocational education, while the other two organizations had lower skilled employees. Interesting for future research is whether these contexts can influence work-floor employee participation and can influence the extent of the stimulating or non-stimulating effect of HRM activities.

6. Conclusion

The purpose of this research was to answer the following research question: *'How can HRM activities facilitate/inhibit participation of work-floor employees in innovation through a (online) suggestion system?'*. This study showed that the degree of participation in EDI through an online suggestion system is influenced by the employees' experience of the antecedents and mechanisms (i.e., attribution theory). When work-floor employees experience HRM activities as facilitating, positive sided mechanisms will increase participation in EDI. These positive mechanisms are ability, motivation, opportunity, willingness, and expectation. But if work-floor employees experience HRM activities as inhibiting, the negative sided mechanisms will cause a lower participation. These are the counterparts of the positive mechanisms, namely inability, demotivation, impossibilities, unwillingness, and no expectation. Several HRM activities have been found that influence the employees' experience of antecedents and mechanisms and thus affect participation. These are divided into the following categories: HR-practices, organizational context, external context, managerial behavior, employee characteristics, system-related factors, process-related factors, and resources. Each of these categories contain important factors and as such impact participation.

The most influential HR-practice is the combination of 'assessment, annual team targets, and monetary reward'. When these HR-practices include an innovation component, this will facilitate participation of work-floor employees because they experience an expectation and motivation. Depending on the content, these factors can influence the entire EDI process. When work-floor employees are assessed on the entire process, this also affects the entire process. It could be that if the focus is only on idea generation, this part is only affected. Regarding external context, 'COVID-19' causes employees to experience impossibilities which seems to have a negative effect on participation in EDI in general. Furthermore, 'COVID-19' seems to have an indirect negative effect on participation by negatively affecting other antecedents. Looking at organizational context, there also emerges a negative effect. If work-floor employees experience 'dependencies' within the organization, this can cause employees to experience inability, demotivation, and impossibilities, in turn this will have a negative effect on their participation in idea development/implementation. Moreover, this study showed that the role of the HR-department was missing. Nonetheless, the managerial behavior seemed to be a very important influence on the participation of work-floor employees. Work-floor employees experienced 'supportive supervision' mainly as positive for their participation in idea generation. But this factors also seems to have an effect on idea development/implementation. In idea generation 'supportive supervision' mainly seems to stimulate the mechanism motivation, while in idea development/implementation it seems to support and increase the mechanisms ability and opportunity. Furthermore, when work-floor employees experience 'getting no feedback' on their idea this will have a negative effect on their participation in idea generation because they experience inability and demotivation to participate. Since the employee's experience of the antecedents and mechanisms is very

decisive for the participation in EDI, the employee's characteristics can be seen as the basis for this. If work-floor employees are 'intrinsically motivated' to contribute to continuous improvement, this seems to ensure that they contribute of their own accord. In addition, fewer other factors seem to be needed to encourage work-floor employees to do this, and the perspective is less likely to be negative. The most important antecedent within the cluster system-related factors is 'functionalities: high difficulty'. The experience of this factors ensures that employees perceive inability and unwillingness to participate in the online suggestion system. This factor can therefore lead to a reduced participation in an online suggestion system. Regarding process-related factors, the 'feeling that nothing is done' seems to be a main motive for work-floor employees to become unwilling to participate. This results in hardly or no participation in idea generation. Lastly, the resource 'time' and especially the feeling that there is 'no time', appears to cause experiencing impossibilities, which hinders the participation of work-floor employees in idea development/implementation.

Concluding, work-floor employee participation in EDI through an online suggestion system can be influenced by an employee's experience of the HRM activities. This experience can evoke different mechanisms in employees that influence their participation. Whereas the positive sided mechanisms seem to facilitate work-floor employee participation in EDI, the negative sided mechanisms appear to inhibit this participation.

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8. Appendix

Appendix I: Interview protocols

Interview protocol manager

Preface

First of all, thank you very much for doing this interview with us. The interview will last approximately one hour. And it's about Coimbee's innovation toolbox that you use. It concerns two studies, one of which focuses on the participation of employees and the other study is about the implementation of ideas, i.e., the actual introduction and integration in the organization. All information will be treated confidentially. Anonymity is thereby guaranteed. Do you agree with this interview being recorded? The structure of the interview consists of some general questions about the toolbox. Then we have some questions about the improvement suggestions process. Below we have a number of questions about the participation and implementation of ideas related to various activities that you or the organization undertake. This could be HR activities, for example, but also policy. Think of training, remuneration, performance interviews, motivation, work content, etc.

Do you have any questions beforehand?

Table 9: Interview protocol manager.

Focus of the research	Sub Focus of Research	Questions
Opening of the interview	Introduction	Explanation of research protocol and questions
		Could you introduce yourself and explain the work that you do for company X?
General beliefs about the formalized system route of EDI	General thoughts about the online suggestion system	Can you explain Coimbee in a few words to us? How does it work? What is your view on Coimbee?
	Experience with the online suggestion system	To what extent are you (or the HR department) involved with the suggestion system?
		What is the role of HR concerning the toolbox/continuous improvement/ innovation?
		What is the HR policy concerning the toolbox/continuous improvement/ innovation?
Generation phase of EDI	Participation of employees in the suggestion system	Could you tell us something about the participation of employees in generating and registering ideas in the toolbox? Probe: can you describe how you or the organization stimulates the participation of employees in generating and submitting ideas? Are there any other factors that prevent this? If yes, which one?
Promotion phase of EDI	Participation of employees in the suggestion system	Could you tell us about employee participation in the selection process and

		then the development of ideas? Probe: can you describe how you or the organization stimulates employee participation in the selection of ideas? Are there any other factors that prevent this? If yes, which one?
Implementation phase of EDI	Participation of employees in the suggestion system	Can you tell us something about employee participation in the introduction of ideas into the organization (and feedback and learning from ideas)? Probe: can you describe how you or the organization stimulates this participation of employees in the implementation? Are there also factors that prevent this? If yes, which one?
Improvement process	General participation of employees	Can you tell us something about employee participation in continuous improvement / innovation? Probe: what is the organization doing to increase participation? What could prevent employees from participating?
	Participation	Could you tell us a bit about employee engagement within company…? Probe: what is being done to increase engagement? What are the factors that can make employees less engaged?
HRM activities	Ability-enhancing practices (e.g., training and development)	Could you explain which methods are used to train employees? Could you explain which methods are used to evaluate employees?
		To what extent do the employees have the capacities to implement ideas themselves (which have been entered via the toolbox)?
		Could you explain what you, your department, or the organization is doing to encourage this?
	Motivation-enhancing practices (e.g., reward, job security)	Could you explain the motivation of employees to be involved in the implementation of ideas (or in continuous improvement)?
		Can you describe how the organization or HR ensures that they are motivated? (in connection with continuous improvement or general)
	Opportunity-enhancing practices (e.g., autonomy, task composition, job demands, time pressure, feedback etc.)	To what extent do the employees have the opportunity to work individually or in a team on the implementation of their own ideas (or continuous improvement)?
		What is the organization, you, or your department doing to stimulate this?
	Fail to implement ideas	What is the organization, your department, or you yourself doing that

		can prevent the implementation of ideas (or continuous improvement)?
Ending the interview	-	'Thanking participant and explaining the follow-up process'

Ending

Thank you for taking the time to do this interview. We are going to type out the interview and we will send it to you. Here you can then give any comments or give. As soon as the investigation is fully completed, we will also ensure that a summary comes your way.

Interview protocol work-floor employee

Preface

First of all, thank you very much for doing this interview with us. The interview will last approximately one hour. And it's about Coimbee's innovation toolbox that you use. It concerns two studies, one of which focuses on the participation of employees and the other study is about the implementation of ideas, i.e., the actual introduction and integration in the organization. All information will be treated confidentially. Anonymity is thereby guaranteed. Do you agree with this interview being recorded? The structure of the interview consists of some general questions about the toolbox. Then we have some questions about the improvement suggestions process. Below we have a number of questions about the participation and implementation of ideas related to various activities that you or the organization undertake. This could be HRM activities, for example, but also policy. Think of training, remuneration, performance interviews, motivation, work content, etc.

Do you have any questions beforehand?

Table 10: Interview protocol work-floor employee.

Focus of the research	Sub Focus of the research	Question
Opening of the interview	Introduction	Explanation of research protocol and questions.
		Could you introduce yourself and explain the work that you do for company X?
General beliefs about the formalized system route of EDI	General thoughts about the online suggestion system	Can you explain Coimbee in a few words to us? How does it work? What is your view on Coimbee?
	Experience with the online suggestion system	To what extent do you, as an employee, deal with the online suggestion system? Can you give an example?
		Can you give a detailed explanation of how your idea was processed by the system?
Generation phase of EDI	Participation/interaction with the suggestion system	Do you work with the toolbox by generating ideas and registering them? If so, can you indicate in as much detail as possible how this process went? If not, why not?

		What were important factors for this process to succeed? Which factors inhibited this process?
Promotion phase of EDI	Participation/interaction with the suggestion system	Do you interact with the toolbox by selecting and developing ideas? If so, can you indicate in as much detail as possible how this process went? If not, why not?
		What were important factors for this process to succeed? Which factors inhibited this process?
Implementation phase of EDI	Implementation through online suggestion systems	How does having an online suggestion system influence the implementation of ideas that you submit?
	Failure to reach the idea implementation phase	Of all the ideas that are being submitted through the online suggestion system, how many are implemented? Why do you think some ideas are not being implemented? (when they are deemed profitable/feasible etc.)
	Participation of employees in the implementation phase	Do you interact with the toolbox by executing ideas, reporting ideas and/or learning from ideas? If so, can you indicate in as much detail as possible how this process went? If not, why not?
		What were important factors for this process to succeed? Which factors inhibited this process?
HRM activities	Ability-enhancing practices (e.g., training and development)	In what way do you have the abilities to be engaged in the idea implementation through the online suggestion system?
		Can you explain what the organization does to support this?
	Motivation-enhancing practices (e.g., reward, job security)	Can you tell me about your motivation to be engaged in the implementation of ideas that have been submitted by you or one of your colleagues?
		Can you describe how the organization stimulates or motivates you to do so?
	Opportunity-enhancing practices (e.g., autonomy, task composition, job demands, time pressure, feedback etc.)	In what way do you and your colleagues have the opportunity to implement ideas submitted through the online suggestion system?
		What does the organization do to increase the opportunity of employees to participate in the implementation of ideas?
	Fail to implement ideas	What does the organization / your manager do to prevent the implementation (execution) of ideas?
Ending the interview	-	'Thanking participant and explaining the follow-up process'

Ending

Thank you for taking the time to do this interview. We are going to type out the interview and we will send it to you. Here you can then give any comments or give. As soon as the investigation is fully completed, we will also ensure that a summary comes your way.

Interview protocol HR

Preface

First of all, thank you very much for doing this interview with us. The interview will last approximately one hour. It concerns two studies, one of which focuses on HRM activities that influence participation in an innovation toolbox. The other study is about HRM activities that influence the implementation of ideas through such a toolbox. All information will be treated confidentially. Anonymity is thereby guaranteed. Do you agree with this interview being recorded? The structure of the interview consists of some general questions about the toolbox/continuous improvement. then there are a number of questions about employee participation. Finally, we have a number of questions about HRM activities.

Do you have any questions beforehand?

XXX = only ask if HR is directly involved in the toolbox, otherwise proceed to XXX and continue to ask questions, especially activities.

XXX = questions based on the toolbox if HR is directly involved, questions in general otherwise, or continuous improvement/innovation.

Table 11: Interview protocol HR.

Focus of the research	Sub Focus of Research	Questions
Opening of the interview	Introduction	Explanation interview protocol and structure of questions etc.
		Could you introduce yourself and explain your position at organization X?
General beliefs about the formalized system route of EDI	General thoughts about the online suggestion system	Could you briefly explain the toolbox to us? How does it work? What is your perspective on the toolbox?
	Experience with the online suggestion system	To what extent are you or your department involved in the toolbox?
		What is the role of HR with regard to the toolbox/continuous improvement/ innovation?
		What is the HR policy regarding the toolbox/continuous improvement/ innovation?
		How does HR ensure that everyone within the company looks the same way? Strategic/systems/policy

Generation phase of EDI	Participation of employees in the suggestion system	Can you tell us something about the participation of the employees in devising (generating) and registering ideas in the toolbox? Probe: can you describe how yourself or the organization stimulates employee participation in devising and submitting ideas? Are there any other factors that prevent this? If yes which one?
Promotion phase of EDI	Participation of employees in the suggestion system	Can you tell us about employee participation in the selection process and then the development of ideas? Probe: can you describe how yourself or the organization stimulates employee participation in the selection of ideas? Are there any other factors that prevent this? If yes which one?
Implementation phase of EDI	Participation of employees in the suggestion system	Can you tell us something about employee participation in the introduction of ideas into the organization (and feedback and learning from ideas)? Probe: can you describe how yourself or the organization stimulates this participation of employees in implementation? Are there also factors that prevent this? If yes which one?
Improvement process	General participation of employees	Can you tell us something about employee participation in continuous improvement / innovation? Probe: what is the organization doing to increase participation? What could prevent employees from participating?
HRM activities	Involvement/participation	Could you tell us a bit about employee engagement with the company…? Probe: what is being done to increase engagement? What are factors that can make employees less engaged?
	Ability-enhancing practices (e.g., training and development)	Could you explain which methods are used to train employees? (In a general sense) Could you explain which methods are used to evaluate employees? (In a general sense)
		To what extent do the employees have the capacities to implement ideas themselves (which have been entered via the toolbox)?
		Could you explain what yourself, your department, or the organization is doing to encourage this?
	Motivation-enhancing practices (e.g., reward, job security)	Could you explain the motivation of employees to be involved in the implementation of ideas (or in continuous improvement)?

		Can you describe how the organization or HR ensures that they are motivated? (in connection with continuous improvement or general)
	Opportunity-enhancing practices (e.g., autonomy, task composition, job demands, time pressure, feedback etc.)	To what extent do the employees have the opportunity to work individually or in a team on the implementation of their own ideas (or continuous improvement)?
		What is the organization, yourself or your department doing to stimulate this?
	Fail to implement ideas	What is the organization, your department, or yourself doing that can inhibit the implementation of ideas (or continuous improvement)?
Ending the interview	-	'Thanking participant and explaining the follow-up process'

Ending

Thank you for taking the time to do this interview. We are going to type out the interview and we will send it to you. Here you can then give any comments or give. As soon as the investigation is fully completed, we will also ensure that a summary comes your way.

Appendix II: Coding template

Third order code	Second order code	First order code
HRM factors stimulating and/or inhibiting continuous improvement	Assessment/reward	Assessment cycle includes continuous improvement
		Assessment cycle can include continuous improvement but is not a fixed criterion
		Assessment cycle does not include continuous improvement
	Employee turnover	Change of leader improvement team
		Change of management
		Change of manager continuous improvement
		Change of manager use of Coimbee
		Employee turnover
		No employee turnover
	Annual targets continuous improvement	Annual targets include continuous improvement
		Annual targets do not include continuous improvement: neutral
		Annual targets do not include continuous improvement: less
		More focus on continuous improvement in the future
	Innovative culture	Open culture
		Continuous improvement woven in organizational policy
		Manager tries to set up improvement culture
		Difference between work floor and office
	Job profile	Continuous improvement included in task composition management
		Continuous improvement included in task composition manager
		Continuous improvement not included in task composition manager
		Continuous improvement included in task composition employee
		Continuous improvement not included in task composition employee
		Manager perceives continuous improvement as a job responsibility
		Employees perceive continuous improvement as a job responsibility of their manager
		Employee perceives continuous improvement as a job responsibility: idea generation
		Employee perceives continuous improvement as a job responsibility: idea development
		Employee perceives continuous improvement as a job responsibility: idea implementation
		Employee perceives continuous improvement as a job responsibility of the manager
		Rigid thinking in functions
	Recruitment	Recruitment based on improvement mindset
	Reward	Monetary reward affected by continuous improvement
		Non-monetary appreciation
		Non-monetary appreciation: idea generation
		Non-monetary appreciation: idea development
		Non-monetary appreciation: idea implementation
		Manager does not want to punish employees if they do not participate in continuous improvement
		Competition effect: idea generation
		Celebrate successes
	Time/capacity	Core activities take precedence over continuous improvement: idea implementation
		Feeling that there is no space to improve
		Feeling that there is no time: idea generation
		Feeling that there is no time: idea development
		Feeling that there is no time: idea implementation

		Feeling that there is no time: neutral
		Feeling that there is time: idea generation
		Feeling that there is time: idea development
		Feeling that there is time: idea implementation
		High workload
		High workload: idea generation
		High workload: idea implementation
		IT limited capacity: idea generation
		IT limited capacity: idea development
		IT limited capacity: idea implementation
		Participation in improvement team in addition to own activities
		Feeling that there is no time to promote the usage of Coimbee
	Training	Training specifically for continuous improvement
		No training specifically for continuous improvement
		Number of training sessions at the introduction of Coimbee from external consultant
		Training for personal development
		Follow training in own time
		Training canceled by organization because of workload: idea implementation
		Feeling that there is no time for training
		Learning from others outside the team
		Learning from others within the team
		Learning through execution
Additional factors stimulating and/or inhibiting continuous improvement	Budget	Budget different per team: idea implementation
		Budget limited: idea implementation
		Budget requests: idea implementation
		Investment freeze COVID-19: idea development
		Investment freeze COVID-19: idea implementation
		Role manager in requesting budget: idea implementation
	Communication	Communication about goal continuous improvement
		Communication through intranet
		Communication through newsletter
		Communication limited between departments
		Feedback properly reasoned: idea generation
		Feedback not properly reasoned: idea generation
		Feedback on continuous improvement
		No feedback on continuous improvement
		Take care that ideas do not hold employees accountable for performance
	COVID-19	COVID-19 causes additional work
		COVID-19 causes more time to work on continuous improvement
		Different work environment
		Investment freeze COVID-19: idea development
		Investment freeze COVID-19: idea implementation
	Cooperation	Cooperation with order departments: idea generation
		Cooperation with other departments: idea development
		Cooperation with other departments: idea implementation
		Cooperation within team: idea development

		Cooperation within team: idea implementation
	Dependency	Depending on external consultant Coimbee
		Depending on external organization: idea implementation
		Depending on other department: idea generation
		Depending on other department: idea development
		Depending on other department: idea implementation
		Different roles have different interests
		Role manager with ideas which cannot be executed by employees
Roles of stakeholders	Role of HR department	HR does not direct managers to involve employees in continuous improvement
		HR involved with Coimbee when improvement suggestion is HR-related
		HR supports managers
		HR trigger by interview to do more with continuous improvement
		HR not directly involved in continuous improvement
		No HR policy for continuous improvement
	Role of specialized employees (improvement team)	Change leader improvement team
		Continuous improvement not laid out wide enough
		Encouragement improvement team
		Encouragement specialized employees
		Improvement team get a lot of freedom
		Improvement team includes employees with different levels of education
		Improvement team needs to be actively involved with improvements
		Improvement team tries to involve employees
		Members for improvement team selected
		Overlap ideas from improvement team and HRM (Arbo)
		Participation in improvement team in addition to own activities
		Perception of improvement team neg.
		Specialized employee takes lead in idea development
		Specialized employees for continuous improvement
		Specialized employees work on implementation
		Toolbox meetings due to Coimbee/improvement team
		Weekly meeting improvement team
	Role of management	Difficult to create support for continuous improvement (suggestion system) within organization
		Encouragement organization: idea generation
		Encouragement organization: idea development
		Encouragement organization: idea implementation
		Improvement projects from management
		Management did not indicate that company should work with Coimbee
		No encouragement organization
	Role of manager	Encouragement manager
		Encouragement manager: idea generation
		Encouragement manager: idea development
		Encouragement manager: idea implementation
		No encouragement manager
		Manager asks critical questions: idea generation
		Manager does not want to punish employees if they do not participate in continuous improvement
		Manager wants to create one working method for continuous improvement for the entire organization

		Meeting manager: idea generation
		Meeting manager: idea development
		Role manager in priotizing an idea: idea implementation
		Role manager with ideas which cannot be executed by work floor employees
		Stance/behavior manager neg.: idea generation
		Stance/behavior manager neg.: idea implementation
		Stance/behavior manager pos.: idea implementation
		Stance/behavior manager: idea generation
		Stance/behavior manager: idea development
		Stance/behavior manager: idea implementation
		Support manager: idea generation
		Support manager: idea development
		Support manager: idea implementation
		Threshold to indicate an idea to management: idea generation
	Employee behavior	Big team: idea implementation
		Employees are intrinsically motivated to work on continuous improvement
		Employees focus on core activities: idea generation
		Employees focus on core activities: idea development
		Employees focus on core activities: idea implementation
		Employees involved in organization: idea generation
		Employees once on the move is contagious
		Employees perceive that they have to take initiative to stay involved
		Employees run into things: idea generation
		Employees who do not participate are drawn along by employees who do
		Employees who do not want to be involved with continuous improvement
		Employees with ideas do not take action to promote and implement idea
		Employees/managers like to continue to work according to the old method
		Fear of the new or consequences: idea generation
		New employees, new insights: idea generation
		New employees, not feeling comfortable/do not know the organization
		Not see the benefit of an improvement
		Perception of improvement team neg.
		Resistance
		Resistance employees who work at the organization for a long time
		Resistance employees: idea implementation
		Smoothly running process: idea implementation
		Threshold to indicate an idea to management: idea generation
	Employee contribution	Ability to use Coimbee
		According to manager every employee may work on continuous improvement
		Active participation employee
		Employees are able to develop their own idea
		Employees can shape a suggestion to a certain extent
		Employees who feel taken seriously: idea development
		Employees come with ideas
		Feeling pressure to work on idea after putting it in the suggestion system: idea development/implementation
		Input employees on the work floor important

		Involving employees in the entire process ensures acceptance
		Involving employees in the entire process: idea development
		Involving employees in the entire process: idea implementation
		Not involving employees in the entire process: idea development
		Not involving employees in the entire process: idea implementation
		Participation depending on whether you are in the project group: idea development/implementation
		Perceived ability employees: idea development
		Perceived ability employees: idea implementation
		Perceived lack of ability employees: idea development
		Perceived lack of ability employees: idea implementation
Added value and/or limitation suggestion system	Functionalities suggestion system	Coimbee is unclear, lots of functions
		High threshold Coimbee
		Suggestion system creates transparency: idea generation
		Low threshold suggestion system: idea generation
		Suggestion system for cooperation within organization
		Suggestion system for overview/structure
		Suggestion system for transparency
		Suggestion system prevents double work
		Suggestion system sends a reminder: idea development
		Suggestion system serves as tool for continuous improvement
		Suggestion system to indicate benefit of idea
		Suggestion system to monitor progress
		Suggestion system with a low threshold
	Use of suggestion system	Bottom-up implementation of Coimbee
		Coimbee not indoctrinated
		Continuous improvement possible without a system
		Develop a structure to work on continuous improvement
		Difficult to work with Coimbee
		Do not use Coimbee
		Good use Coimbee
		Little use Coimbee
		First year effect suggestion system
		Having many different systems makes it unattractive to work with Coimbee
		Limited number of systems should support working with Coimbee
		Does not have someone promote the suggestion system
		Feeling that someone needs to stimulate/coordinate continuous improvement (use of suggestion system)
		Have someone promote the suggestion system
		Management did not indicate that company should work with Coimbee
		No access to a computer ensures less participation
		No knowledge of/about Coimbee
		No specific suggestion system for continuous improvement
		Not everyone has access to Coimbee
		Not motivated to work with Coimbee
		Other teams do not fill in the system
		Manager uses notebook to write down ideas
		Support to work with Coimbee

		Type of suggestion system does not matter
		Use of suggestion system enhances innovativeness
		Use of suggestion system does not promote innovativeness
		Use Trello
Continuous improvement	Platform continuous improvement	Communication through intranet
		Communication through newsletter
		Day start for continuous improvement: idea generation
		Day start for continuous improvement: idea development
		Day start for continuous improvement: idea implementation
		No day start for continuous improvement: idea generation
		Employees without access can tell ideas through other channels: intranet, F2F, e-mail
		Low threshold channel: idea generation
		Toolbox meetings due to Coimbee/improvement team
		No knowledge about a project when not involved in project group
		Physical board with suggestions
		Physical suggestion box in factory
		Team meeting: idea generation
		Weekly meeting project group: idea development
	Process continuous improvement	Department not actively engaged in continuous improvement
		Confusion about responsible person
		Process continuous improvement unclear
		Loss of structure: idea implementation
		Continuous improvement needs attention
		Feeling that someone needs to stimulate/coordinate continuous improvement
		Develop a structure to work on continuous improvement
		Different working method continuous improvement between departments
		Employees are able to develop their own ideas
		Employees can shape a suggestion to a certain extent
		Employees develop idea
		Employees consider meeting structure unnecessary
		Focus on easy to solve ideas: idea implementation
		Good problem description important
		Hear ideas from colleagues around me
		Involving employees in the entire process ensures acceptance
		Involving employees in the entire process: idea development
		Involving employees in the entire process: idea implementation
		Not involving employees in the entire process: idea development
		Not involving employees in the entire process: idea implementation
		Idea (if necessary) in consultation with manager: idea implementation
		Idea in consultation with manager: idea implementation
		Suggestions from department plan
		Manager (management) selects ideas
		Manager does implementation idea
		Specialized employee takes lead in idea development
		Specialized employees for continuous improvement
		Specialized employees work on implementation

		Opportunities to improve
		Limited opportunities to improve
		Project group forming (concerning different levels of motivation)
		Variety of work: idea implementation
	Progress/result continuous improvement	Continuity company motivation of continuous improvement
		Continuous improvement makes work easier
		Feeling that nothing is being done with ideas
		Feeling that nothing is being done with ideas: idea generation
		Feeling that nothing is being done with ideas: idea development
		Selection of ideas takes a long time: idea generation/development
		Result shows that continuous improvement pays off
		Result shows that continuous improvement pays off: idea generation
		Result shows that continuous improvement pays off: idea implementation
	Suggestion types of continuous improvement	Difficult suggestion: idea development
		Difficult suggestion: idea implementation
		Easy, not complex suggestion: idea implementation
		IT-related suggestions
		Not IT-related suggestions
		Faster production process scope of improvement team
		Process improvement

Appendix III: Overview of antecedents affecting participation of work-floor employees in EDI and an online suggestion system

Table 12: Detailed description antecedents within SocialSecure Inc.

Area	Factor	Sample quotes	EDI phase	Mechanism
HR-practices	Assessment	+ *"There is always a part of continuous improvement as a performance. So, you go for example, yes, this year you realize three improvements, quite general. But hey, there is a result objective in it, but we also talk about results competencies. Result is not the right work, but expectations for the competences. So, what behavior and attitude do you show when it comes to continuous improvement." – AAMA01* + *"In the beginning of the year we had to, everyone individually, we had to provide an improvement, with things you thought of 'oh this can improve our process'. And at the end of year, it is checked whether you have done something with it and whether something has come out of it. Look and that it did not work out completely, that is not necessarily bad, but you must have paid attention to it." – ABWE04* +/- *"Those goals you have every year, that you can choose goals. There you can also choose a kind of improvement goals. So that you work on that. But you cannot choose it either." – AAWE03*	Linked with 'monetary reward' + All phases	Creates an expectation and motivation
	Monetary reward	+ *"And at the end of the year you will be scored on your goals. So, then you can either score 80% or you can score 120% or in between. And then you attach your bonus to that." – ABWE04*	Linked with 'assessment' + All phases	Creates an expectation and motivation
	Training	+ *But I will also follow a training for this myself from January, to be able to do that (idea implementation). That is also a motivation, something they invest in the employees, that they are open to offer you that training." – ABWE04*	Depends on: Focus of the training + Idea implementation	Gaining ability and motivation
	Task composition	+ *"But what I get a little from now, let's say, in my current role, that employees are certainly expected to contribute ideas, to come up with ideas." – ADHR01* + *"With some teams, it can indeed be part of your position. So that it (continuous improvement) is expected of you." – ADHR01* +/- *"Of course, I was given the task of keeping up with that (idea development/implementation). Maybe that's why it's a little less because they (other employees) might not really see that as a task. – AAWE03*	+ Idea generation – Idea development and implementation	Included in task composition: Causes an expectation Not included in task composition: Causes demotivation
External context	COVID-19	- *"Well then corona came and yes then that's the is the day start, the day starts have continue, but under a completely different dynamic. Yes, much less involvement in one way or another. Less interaction. And yes, it is also the one I can also count on myself. So, the dynamics of improving, say, yes, has had little place there." – AAMA01*	–– All phases	Causes experiencing impossibilities and working from home creates another dynamic which makes it harder to participate in EDI.
Organizational context	Organizational support	+ *"There is of course a policy that is established from a higher hand. And well, that will usually be that they want to get more customers of course. So yes, in that sense it is encouraged to think about; yes, how can we keep our services up to standard with even more customers." – AAWE01* + *"No really, no and within SocialSecure Inc. they are also very much about stimulating to implement*	+ All phases	Organizational support: Creates an opportunity and expectation

		improvements, actually. So, they are very open to it." – ABWE04		
	Innovative culture	+ *"I do not know how well you know SocialSecure Inc., but SocialSecure Inc. is a company that continuously wants to improve, continuously wants to pick up new things. It is a company that is moving really fast. And what is also required for this is that your employees come along and can go along. And that also means that they sometimes have to go through a certain improvement." – ADHR01* +/- *"And with that you hope in a somewhat smaller context that you hope that yes, there will be a culture of 'oh wait it is cool and here I can provide my input, here I see that my action yield results'. And so, it is sometimes a bit for the form, but yes, I really try to be aware that everyone is going to get moving. – AAMA01*	+ All phases	Creates an opportunity and willingness
	Dependencies	- *"Sometimes you just run into ideas having to do with systems or something like that and then you just have to be very realistic. There are always many more ideas than there is capacity at IT. And yes, and then it might end upon a list." – AAMA01* - *"So, we quite often run into problems with that system. And then we ask to implement an improvement in this. Only some departments have priority to make changes to that system. Which puts us on hold again. And we into that quite a bit. So, then we have an innovation in mind, but then it takes another three months or maybe six months before something is actually adjusted. And that is of course quite demotivating for employees." – AAWE02*	–– Idea development and implementation	Ensures impossibilities, inabilities, and demotivation
	Cooperation	+/- *"What we see in particular, is that if improvements remain within one team, then that is a fairly natural way to talk about it with each other, but you also have improvements that go across teams. And that is much more difficult to orchestrate, so to speak." – ACMAS02* + *"(What made the implementation of such an idea successful?) Yes, I do think the active collaboration with the other teams." – AAWE01*	+ Idea development and implementation	Creates opportunities, abilities, and motivation
	Change of manager	- *"Yes, there are also a few teams that have used the tool, but then you see for example, a change of manager or there is a large project and people have been working on it and then it is lost sight and is no longer being done." – ACMAS02*	– Participation in online suggestion system	Ensures no expectation
	Number of systems present in organization	- *"At SocialSecure Inc. we really work with a lot of different types of systems that do not talk to each other. And not half a year passes without a new system being implemented. So, people are a bit tired too. They are like well I wait a bit and then I will see what we have come up with for something else. So, the interest in understanding it also diminishes a bit." – ABMA03*	– Participation in online suggestion system	Many different systems: Provides resistance to the introduction of a new system and so ensures experiencing unwillingness
Managerial behaviors	Supportive supervision	+ *"I mainly ask a lot of questions. If I never hear someone about improvements, I will ask 'hey what's the reason that I never hear you about it?'. Well, then you also immediately hear the obstruction." – AAMA01* + *"Well, it is often said. That yes, my manager really stimulates it (continuous improvement). He also always indicates; if you have any ideas, let me know." – AAWE02*	++ Idea generation + Idea development and implementation	Supportive supervision: Ensures motivation and ability No supportive supervision: Ensures demotivation and inability
	Feedback	+/- *"What I want to say is that every idea is taken seriously. So, we discuss it. Because I do not want if someone comes with an idea that is immediately*	Getting feedback: + Idea generation Not getting feedback:	Getting feedback: Ensures motivation and ability

		flattened. And yes, such a person will no longer come up with an improvement idea." – AAMA01 + *"For example, I try to ask the kind of questions so that someone eventually comes back with a better idea, instead of us shooting it down completely." – ABMA03*	– Idea generation	Not getting feedback: Ensures demotivation and inability
	Non-monetary appreciation	+ *"And there are also, say, improvements are also discussed in the entire teams. So, if, for example, if you really achieved something with your sub team, then it is said to be praised." – ABWE04*	+ Idea generation	Ensures motivation
Employee attitude	Intrinsic motivation	+ *"I just really enjoy improving things. So yes, I think that's just, yes, I am young, and I can see it for me that everything will of course soon be automated and stuff. And I just really enjoy contributing to that. Yes, I just like to watch. Well, is this efficient and couldn't it be better? And there is always room for improvement. Yes, I just like to do that, that is what motivates me." – AAWE03* +/- *"And for some people this is easier, and they find it very attractive to hear, and another is a bit shocked by it. Well, I don't have to." – AAMA01*	Intrinsic motivation: ++ Idea generation + Idea development and implementation No intrinsic motivation: – Idea generation	Intrinsic motivation: Ensures willingness and motivation No intrinsic motivation: Creates unwillingness
System-related	Accessibility of the online suggestion system	- *"That it is easily accessible because that was sometimes a stumbling block with the toolbox. Because there is also a direct link in teams that we can use for Trello." – AAWE02*	– Participation in online suggestion system	Causes experiencing difficulties which creates unwillingness amongst employees
	Functionalities of Coimbee	- *(High difficulty)* *"No when I really thought 'oh this (Coimbee) is really too much'. While I think if I get it and that I can implement it better, because now I cannot implement something that I do not understand myself." – ABMA03*	– Participation in online suggestion system	High difficulty: Experiencing unwillingness to work with Coimbee
Process-related	Fixed moment of attention	+ *"I believe we also have a kind of general team meeting once a month in which we also discuss these kinds of matters. So, that we really go through the state of affairs for a moment, apart from what the daily state of affairs is, but that we just look at the larger perspective." – AAWE02*	Having a fixed moment of attention: + All phases	Fixed moment of attention: Creates opportunities
	Physical suggestion board	+ *"Yes, ideally you are physically in front of a board, and you note your improvements there. Well, that's not going to happen just yet." – AAMA01*	+ Idea generation	Creates opportunities
	Feeling that nothing is done	- *"We have a statement in our company called 'stop starting, start finishing'. We are a company bursting with ideas and half of those ideas die a clean death. Because we just, then we have another idea and then we get on with it, and then we don't finish it again." – ACMAS02* - *"Because if it does not yield anything, if you do not achieve results in improving, then the enthusiasm will of course decrease." – AAMA01*	– Idea generation	Ensures demotivation
	Seeing result	+ *"And also see that it (idea implementation) pays off. So, with us it (motivation to implement) is very high. – ABWE04*	+ Idea implementation	Creates motivation
	Type of suggestion	+/- *"Well, it depends on whether they are very drastic parts. If it is really something small, yes, we do it ourselves. But if they are really radical process changes, yes, they will go to the team leader." – ABWE04*	Easy suggestion: + Idea development and implementation Difficult suggestion: – Idea development and implementation	Easy suggestion: Ensures the opportunity and ability Difficult suggestion: Ensures impossibility and inability

	Promotion of the online suggestion system	- *"Whoever organized that doesn't work for the domain anymore either, so it becomes a bit of a lost thing." – ABMA03* + *"But it is, you have to constantly pay attention to that. Actually, with everything in a company that you have to return more and more of 'ok what did we agree, what would we do?' And okay let's stick to it." – ACMAS02*	Not having someone promote: – Participation in online suggestion system Having someone promote: + Participation in online suggestion system	Not having someone promote: Causes less attention on the system, which ensures experiencing no expectation Having someone promote: Generates attention for the system, which ensures experiencing expectation
Resources	Time	+/- *"But yes, that is why, for example, that is also the reason that we have been able to make quite a lot of steps. Because we had that time for it. But another team within our department has that a lot less. So yes, that is difficult to say. Because we have, with us it came out just like that. And because we have improved so much, it also creates time." – ABWE04* - *"But in principle we have more work than we can handle properly. As a result, the space is also limited to get started (with idea implementation). – AAWE01*	Having time: + Idea development and implementation Having no time: – Idea development and implementation	Having no time: Ensures impossibilities Having time: Creates opportunities
	Budget	- *"That there is just not always enough budget or space to take up all those ideas. Because they just really go like yes this has a higher priority and then we just have certain capacity that they can do that with." – AAWE03*	– Idea implementation	Ensures demotivation

Table 13: Detailed description antecedents within Machine Inc.

Area	Factor	Sample quotes	EDI phase	Mechanism
HR-practices	Training	+/- *"Yes, you can call it a kind of training. For a number of weeks, we just held a session (with improvement team) once a week in which he (consultant of Coimbee) gave us information to assess, for example, okay this is the problem. At least we discuss this as the problem, but what is the actual problem. And I think that helped a lot to get a certain mindset. – BBWESV02*	Depends on: Focus of the training Training for improvement team member: + Participation in activities of improvement team	Gaining ability and motivation
	Task composition	+ *"So, we have appointed a number of people, within the company, who talk to others about how they might have ideas and not so much to save costs but to see opportunities to simplify, facilitate, relieve your work. Yes, which jobs do you prefer, not to do and how can we approach that." – BAMAV01* - *"Of course, it would be nice if that would eventually come in, say. That you can just spend that much percent of your time on things like that (continuous improvement). But that is not the case yet." – BBWESV02* +/- *"It is not really part of my job responsibilities, but I think you should be open to it." – BAAWE05* + *"Well, I just reported it last Wednesday that I want to see everyone from one proposal from A-to-Z next year and that I will also solve that with them. So, that they are also actively involved in working towards the solution." – BABMA03*	Improvement team responsible for continuous improvement and working with online suggestion system. No expectations (yet) from employees. 0 All phases	Included in task composition: Causes an expectation Not included in task composition: Causes demotivation
External context	COVID-19	- *"It is all a bit distant (due to corona) and there is a certain threshold in it, I notice here. And that you can*	–– All phases	Causes experiencing impossibilities

		do that toolbox (Coimbee), you notice that very well. Because that is actually being pushed a little bit, yes, a little bit to the side now (…). It's not very active." – BAAMA02		and working from home creates another dynamic which makes it harder to participate in EDI.
Organizational context	Organizational support	- *"Actually, not very much from higher up. Actually, from the improvement team." – BCWEV03* - *"Well, that has yet to reveal itself. I have no experience with that yet, let me put it this way." – BABMA03*	– All phases	No organizational support: Ensures impossibilities
	Innovative culture	+ *"We have many loyal committed employees in our company. That's really the majority. And those people want to come up with ideas to ensure that their work or the work of their colleagues or Machine Inc. in general improves or becomes easier or better or faster. They really want that. So, we don't have to add an extra reward or either attract a lot or stimulate it very much. Because that culture is actually already there within Machine Inc." – BEHR01* +/- *"And now I must say we have a very accessible organization. I am responsible for my department, but I can realty go anywhere to discuss something. That is no problem at all." – BAAMA02*	+ All phases	Creates an opportunity and willingness
	Dependencies	- *"Yes, it is not that nothing is done with it, often a start is made. But yes, if you then, for example, someone else, for example, has to deal with another department or something that also has to help or something or someone must be approached, then yes. There is a start, but it is never finished, I have the idea." – BAAWEV04* - *"And sometimes we also sometimes have that it falls under (…), for example, or that it is just about something within the building, you know what is not functioning, so we have to distribute it to other teams. And there you see that it is often not picked up." – BBWESV02*	– Idea development and implementation	Ensures impossibilities, inabilities, and demotivation
	Cooperation	+ *"It is actually the intention that the improvement team works with someone from the company, so that that is an idea, so that comes either from the improvement team itself or from department meetings or work meetings or something like that, an idea comes up. This is submitted to the improvement team and then one member of the improvement team is made responsible for it and he goes to work with the person responsible within the company or with employees to solve it." – BDHR01*	+ Idea development and implementation	Creates opportunities, abilities, and motivation
Managerial behavior	Supportive supervision	+ *"Still, just asking a lot of people to come up with new ideas, just keep encouraging them." – BDWESV01* + *"I want to involve everyone, that would actually be the goal for the coming year, to just implement or give up one improvement proposal to everyone. And also give guidance to it. That they actually just know how it is actually going to improve." – BABMA03* - *"Well, a manager should of course be able to give guidance to the people below him, yes how should I say that, they should be able to lead. But if the manager can't do that, little will happen." – BAAWEV04* - *"The manager has not really fully supported me with continuous improvement from the start. So, it was sometimes difficult to make time for that in the beginning." – BCWEV03*	Supportive supervision: ++ Idea generation + Idea development and implementation No supportive supervision: – Idea generation	Supportive supervision: Ensures motivation and ability No supportive supervision: Ensures demotivation and inability
	Feedback	-	Not getting feedback:	Not getting feedback:

		"The most important thing is, and we sometimes really fall short on that, continue, conclude and, above all, provide feedback on what happened. And again, that may well be that you are not going to do anything with it for such and such reasons. Hey and we don't have the budget, it is too difficult, other things are more important, but also feedback to that person so that the expectation is clear." – BDWESV01 - *"That is registered and for the rest I hear nothing. Because I think, yes if I enter that in the toolbox then I expect a response at some point. Because otherwise I might as well just say it, I can just as easily go to the engineering department and discuss my idea. I have that problem. Then I do it my way as I always did, but then I do it again outside the toolbox." – BAAMA02*	–– Idea generation	Ensures demotivation and inability
	Non-monetary appreciation	+ *"They don't have to be rewarded for that at all, but as long as they are clear and the appreciation is there, and that they (employee with idea) have come up with that idea." – BEHR01* + *"And yet, to show appreciation. This can come in all kinds of forms. To a flower, to a gift voucher or whatever." – BAAWE05*	+ Idea generation	Ensures motivation
Employee attitude	Intrinsic motivation	+/- *Yes, ideas come up very easily, but that does not mean from everyone. There are a number of people who have many ideas or who have a lot of points. But there are also some who have not yet submitted any points at all." – BAMAV01* + *"Yes yes, anyway they want to help, but then actually they come up with an idea and then nothing more is asked of them." – BAAWEV04* - *"Although, the improvement team really tries to involve everyone and tell them why they are doing what they do. It also depends a bit on the people. Not always easy." – BEHR01*	Intrinsic motivation: ++ Idea generation + Idea development and idea implementation No intrinsic motivation: – Idea generation	Intrinsic motivation: Ensures willingness and motivation No intrinsic motivation: Creates unwillingness
System-related	Accessibility of the online suggestion system	- *"But you will see that it is difficult if others do not use the toolbox, for suggestion they need to improve, to record them for someone else. I find that difficult." – BCWEV03*	– Participation in online suggestion system	Causes experiencing difficulties which creates unwillingness amongst employees
	Functionalities of Coimbee	*+ (Overview/structure)* *"I think that toolbox (Coimbee) is easy to collect ideas and that is, yes then you do have a lost where you can hold on to and that might be motivation for others." – BAAWEV04* *- (High difficulty)* *"Well, I think so, at least what I hear from others, it's pretty confusing sometimes. Because there are so many functions that are not used. Or yes, which we haven't really seen the use of yet." – BBWESV02*	+ Participation in online suggestion system – Participation in online suggestion system	Overview and structure: Experiencing willingness to use Coimbee High difficulty: Experiencing unwillingness to work with Coimbee
Process-related	Fixed moment of attention	+ *(How are you involved?) "By having a conversation every week about how or what with the whole group." – BAAWE05* + *"Yes, there are certainly ideas that support at least activities yes, so for example in the factory also the week start." – BCWEV03*	Having a fixed moment of attention: + All phases	Fixed moment of attention: Creates opportunities
	Physical suggestion board	+ *"I think it is really nice to literally hang such a letterbox. That it really becomes very accessible for people. That there is one that you hang there that forms next to it or something, that you can write your ideas on there with your name and the date and that you have put it in." – BEHR01*	+ Idea generation	Creates opportunities

	Feeling that nothing is done	- *"Well, it is also the case, if you indeed have the ideas and you are going to make a list, then you also have to make sure that they remain alive. That there are also just certain things added. That certain things go off. That they also successfully completed. Then people see okay what happens. But if you are indeed going to get a list that nothing will be done with, you say yes let it go, nothing will happen." – BAAMA02* - *"Some people do (come with less ideas). I have heard from someone 'yes, I asked for it three times, now I will not do it anymore'." – BAAWE05*	–– Idea generation	Ensures demotivation
	Seeing result	+ *"When we get things done, it's always, yes, that motivates." – BABWEV06* + *"Finishing things up and that doesn't have to be their own ideas, just that there are results to be seen." – BDWESV01*	+ Idea implementation	Creates motivation
	Type of suggestion	+/- *"Another pitfall is say yes those small improvements that are in it, yes that is nice to do, but that yields very little. And let's say the bigger problem questions, if we pick them up and start with that, that yields a lot more, but it also all takes much longer before that is organized, so yes that is a vicious circle or that its contradiction say that the process does not always simplify." – BAMAV01*	Easy suggestion: + Idea development and implementation Difficult suggestion: – Idea development and implementation	Easy suggestion: Ensures the opportunity and ability Difficult suggestion: Ensures impossibility and inability
	Improvement team	+ *"So, I go through the points with those people and try to guide them in making the choices which points should be dealt with first, of course in consultation with the manager's department, but it is also good to have a different view. A little more overarching about the organization. I try to introduce some structure in that consultation." – BDWESV01* - *"Many people find a meeting structure unnecessary." – BEHR01* - *"Well, I think mainly the improvement group. Think the idea of improving, they like it. But above all, I just think the group, they think 'yes, I don't need such a group for that.' Because there is also a department manager who does not cooperate at all. He also says yes if I need something or if something has to be arranged then I will arrange it, I do not need such a group for that. And in itself yes that is true of course in my opinion." – BAAWEV04*	+ Idea development and implementation – Idea development and implementation – Use of suggestion system	Ensures motivation and unwillingness
	Promotion of the online suggestion system	+ *"So, you have to put someone on it who is going to coordinate and supervise that. You really have to make it a topic." – BEHR01*	Having someone promote: + Participation in online suggestion system	Having someone promote: Generates attention for the system, which ensures experiencing expectation
Resources	Time	+/- *"If it is very busy, it cannot all be done at that time or whatever in order to improve things. Then that has to wait a while. And some understand that, and some don't understand that at all. They want that right a la minute and yes that just isn't possible." – BAAWE05* - *"You are quickly slowed down by people who have a lot of work and who therefore have little time for something. I think I spent six months installing an extractor on a machine that really had to be installed there. But there was just someone who had no time or no sense or no priority." – BDWESV01*	Not having time: –– Idea implementation	Having no time: Ensures impossibilities

	Budget	- *"Sometimes no permission is given from a financial point of view. Because no investments are made, so it stops immediately. Did you get frustration right? Because an employee has a very good idea. And everyone around him thought it was a very good idea, he put it to continuous improvement. They also thought it was a good idea. And then the management says, 'no money'." – BEHR01*	– Idea implementation	Ensures demotivation

Table 14:Detailed description antecedents within Energy Inc.

Area	Factor	Sample quotes	EDI phase	Mechanism
HR-practices	Assessment	+ *"Naturally, they will look at what you have implemented within or in the year. They also look at your attitude and behavior during day starts and meetings and sparring with each other and bringing in ideas, and you name it. So, you don't have to have a bad rating if you haven't made an improvement. But you do have a bad rating if you haven't been able to take a proactive hold and really just play with the team and just take a laxer and more restrained attitude." – CCWE02*	Linked with 'annual team target' and 'monetary reward' + All phases	Creates an expectation and motivation
	Annual team target	+ *"One big incentive was that we included it as a team goal, so that means we had X amount of team goals including so many improvements in Coimbee. Well, and if you did, you would receive a portion of your bonus at the end of the year. So that's the financial incentive." – CCMA03* + *"Well, if of course, it is your team objective or your own objective, well then that is already a bit of stimulation, because with us your bonus depends on that. If team goals are achieved, you will receive a month bonus, so a monthly salary bonus. That is of course very pleasant." – CDHR01*	Linked with 'assessment' and 'monetary reward' + All phases	Creates an expectation and motivation
	Monetary reward	+ *"In any case, if it is included as a team goal, it also means that there is a bonus associated with it." – CCWE02*	Linked with 'assessment' and 'annual team target' + All phases	Creates an expectation and motivation
	Training	+ *"Yes, of course (yellow belt training helped employees participate more in Coimbee), but also because it has helped the employees to actually recognize what you know, how do you go about something you encounter, how do you convert that into an improvement? What should you look at? Is it a one-off thing? Or do several people suffer from it? But you also know how we can work together to make our work better, easier and more fun?" – CCMA03* - *"That we do it with the skills and abilities we already have. And that we are not going to train specifically on this (idea development/ implementation) because that is not our main work." – CCMA03* - *"No training is put on it (idea development/implementation)." – CAWES01*	Depends on: Focus of the training Training: + Idea generation No training: – Idea development and implementation	Training: Gaining ability and motivation No training: Some employees do not have the ability
	Task composition	+ *"Continuous improvement is really part of the work. It is also literally stated in the job description that we expect that if you notice things that you also discuss them and get started yourself." – CBMA02* +/- *"In the operation you have different functions. You also have process experts who are paid to improve processes. They are paid for when there is a fire somewhere to ensure that the problem is identified and that everyone can do their job in a normal way again. They are paid to see the opportunities in processes and how to respond to them. And that's, what is it called,*	Included in task composition: + Idea generation Not included in task composition: – Idea development and implementation	Included in task composition: Causes an expectation Not included in task composition: Causes demotivation

		the project leaders who do that at a cross-team level. So yes, that for the latter two that time is made available for this within the organization, is logical because that is also just part of their duties. That this does not happen at the employee level at the service employee level, is also logical. Because that is simply not part of their job description." – CCMA03		
External context	COVID-19	- *"At the moment it's a bit on hold. Also, because we look at working from home is of course very different from working at the office. So, you notice that the switch has ensured that the Coimbee is now on hold in principle." – CCWE02*	–– All phases	Causes experiencing impossibilities and working from home creates another dynamic which makes it harder to participate in EDI.
Organizational context	Organizational support	+ *"Yes, in any case, the organization is always happy when great ideas are put forward and that they are developed." – CCWE02* - *"I dare not to say whether they (the management) are in favor of us expecting all employees to implement improvement. We've just never talked about that." – CBMA02* - *"But I also really just think mainly that it is because there is not really the emphasis on that we have to put it in here. Things are done without even looking at it. Things are resolved without looking into it. So, then it is very soon that you are not working on it, because it is like oh yes this is extra, this is more for that financial coverage and that we only have it in it." – CBWE03*	Organizational support: + All phases No organizational support: – Idea implementation	Organizational support: Creates an opportunity and expectation No organizational support: Ensures impossibilities
	Innovative culture	+ *"And Energy Inc. is relatively young and flat, you know. Hey, so it is quite easy, yes you know, the first, actually all management layers are very accessible. And the, in general, the employee and the culture is such that yes, the barriers to discussing this with your idea are really just super low at Energy Inc." – CAMA01*	+ All phases	Creates an opportunity and willingness
	Dependencies	- *"What we encounter is that, you know, often for the improvements you need someone else or another team. Nine times out of ten is that IT and that, and IT hours are scarce." – CCMA03* - *"Sometimes it is difficult because you are dependent on someone else's schedule. And they may also have to ask questions to their team leader or the person above them or at least their supervisor. So, you notice that if you work with, the more people you work with, the more difficult it becomes." – CCWE02*	–– Idea development and implementation	Ensures impossibilities, inabilities, and demotivation
	Cooperation	+ *"Linking to, from within myself, linking to the person I know can help them further. That could be a process specialist, that could be a coordinator, or it could just be someone who is responsible for that process that they encounter." – CCMA03* + *"We are quite an open organization, so switching with other teams is very easy with us. So, what you can do if you have multiple teams involved, you also have the option to switch with multiple teams." – CCWE02*	+ Idea development and implementation	Creates opportunities, abilities, and motivation
	Number of systems present in organization	- *"I think that's one because it's just another application that requires separate login credentials. So, it is not made easy for the employee. Just in an existing environment you would that would be easier of course." – CBMA02*	– Participation in online suggestion system	Many different systems: Provides resistance to the introduction of a new system and so ensures experiencing unwillingness

Managerial behavior	Supportive supervision	+ *"Well anyway because I think because I just speak it to employees that I also just expect them to come across something, they just report it." – CBMA02* + *"But also, that we also indicate to our colleagues that we as managers also find it very important that they think along (with idea generation)." – CCWE02*	++ Idea generation + Idea development and implementation	Supportive supervision: Ensures motivation and ability No supportive supervision: Ensures demotivation and inability
	Feedback	+ *"Okay it is not possible, we can understand that, but maybe when feedback is given you also want to know: 'okay it is not possible but what is possible'. And if I put forward such an idea, is it possible in a year or two or what does it take to make it happen? So, I think good feedback is important here." – CCWE02* - *"So, then he runs into something and then what I look for, what I often look for is okay, it crashes (the idea), but then help me as a process expert to perhaps phrase it differently or package it differently or you know. Or maybe make a slightly different problem statement to get it through. But it really just bounces back. And I don't know what to do with it. So, what am I doing? I don't do anything with it." – CAWES01*	Getting feedback: + Idea generation Not getting feedback: – Idea generation	Getting feedback: Ensures motivation and ability Not getting feedback: Ensures demotivation and inability
	Non-monetary appreciation	+ *"In addition, if the organization is happy with an idea, you can also read that in communication within the company itself. So, it could be that there is one that, for example, you end up on the news or in the newsletter with your idea or at least something along those lines. Or intranet, which is a platform where everyone can read all data. So, you do have different ways of making it clear that it is appreciated." – CCWE02* + *"Then donuts are placed every now and then. Why are these donuts laid out? Oh, we have achieved this and this. Ok nice." – CAWES01*	+ Idea development and implementation	Ensures motivation
Employee attitude	Intrinsic motivation	+/- *"I think that it is also important to have employees who have the opportunity, they really like it, and have the skills to do something with it. And other employees don't like it at all. And they like basic work that is expected of them and that's it." – CCWE02* + *"They really like it when you see it for yourself, they also like to stay involved in the follow-up process. And where they can help, they are happy to do so." – CBMA02*	Intrinsic motivation: + Idea generation + Idea development No intrinsic motivation: – Idea generation	Intrinsic motivation: Ensures willingness and motivation No intrinsic motivation: Creates unwillingness
System-related	Accessibility of the online suggestion system	- *"I think that one is because it is yet another application that requires separate login credentials. So, it is not made easy for the employee. Just in an existing environment that would be easier of course." – CBMA02*	– Participation in online suggestion system	Causes experiencing difficulties which creates unwillingness amongst employees
	Functionalities of Coimbee	+ *(Overview/structure)* *"And what I like is that you really have a complete overview of the points for improvement and action points that are taken up within the team. And also, who his name is on." – CCWE02* - *(High difficulty)* *"Coimbee is quite extensive. You can put a lot in it. And actually, where the main thing we used last year is, what improvement is it, the status of the improvements, possibly what will it yield. So not all that other information. I think that also means that people don't like working because there are so many fields, and you end up using three fields or something." – CBMA02*	+ Participation in online suggestion system – Participation in online suggestion system	Overview and structure: Experiencing willingness to use Coimbee High difficulty: Experiencing unwillingness to work with Coimbee
Process-related	Fixed moment of attention	+ *"But furthermore, if I have a bilateral consultation with an employee, I also ask: 'hey, what about your*	Having a fixed moment of attention: + All phases	Fixed moment of attention: Creates opportunities

		improvement idea, what are you up against, let's see something." – CAMA01 +/- *"Last year, we really actively discussed it with the team, say in a meeting. So, we're just going to do as many improvements as we've put in this week, so many have been completed. So, then it was much more alive." – CBMA02*	Not having a fixed moment of attention: – All phases – Participation in online suggestion system	Not having a fixed moment of attention: Ensures impossibilities
	Physical suggestion board	+ *"We had a day start board (…) the other side you had the improvements. All ideas were collected there and from that it was determined okay with this one, we can do something with this or here several people run into it. So, we carry these in Coimbee, and we will also spend energy and time on it." CCMA03*	+ Idea generation	Creates opportunities
	Feeling that nothing is done	- *"Yes, what may also be the case, I sometimes hear of yes, when I raise something, 'nothing is done with it (the idea)." – CBMA02* - *"I think that the longer you sit there and have encountered issues that you have raised more often where, that have been left somewhere. So according to your feeling that nothing has been done with it. That can increase the feeling of why I would put effort into this if nothing were done with it?" – CCMA03* - *"I must say I consciously do not do that now (bring up new ideas). And that also has to do with the fact that I think it will be rejected anyway." – CAWES01*	–– Idea generation	Ensures demotivation
	Seeing result	+ *"And in the end, there is also a very cool result, (…). So that was really motivating for me." – CBMA02*	+ Idea implementation	Creates motivation
	Type of suggestion	+/- *"If it is something very high in difficulty then we have to see if it is worth picking it up. And whether it is possible at all. And if it is something very easy, we just take it up in the team ourselves." – CCWE02*	Easy suggestion: + Idea development and implementation Difficult suggestion: – Idea development and implementation	Easy suggestion: Ensures the opportunity and ability Difficult suggestion: Ensures impossibility and inability
	Promotion of the online suggestion system	+/- *"No yes, that was there, that was the requirement of the person who has now left. But he also left two years ago. And he also said that we are really going to implement it in the day starts. We tasted that for a while, but then came when he left and (…). And now we really limit the day start of the day to just a little chat with each other (…). – CAWES01*	Not having someone promote: – Participation in online suggestion system Having someone promote: + Participation in online suggestion system	Not having someone promote: Causes less attention on the system, which ensures experiencing no expectation Having someone promote: Generates attention for the system, which ensures experiencing expectation
Resources	Time	- *I certainly think in a domain like the operational domain, when it is very busy, we do not always have the capacity to give sufficient hands." – CDHR01* - *"So, if you really say from the organization that we think there is no time for improvements or we think it is important that we just make progress, so targets have been achieved. Then are you going to ensure that employees are not involved at all." – CBMA02* -	Not having time: –– Idea development and implementation Having time: + Idea development	Having no time: Ensures impossibilities Having time: Creates opportunities

		"I sometimes get that back from colleagues. They all have things they really want to get started with, but the time and space is not there at that moment because there are other priorities." – CDHR01 + *"So, someone comes up with an idea and if time is made available for it, as we put it, we put it in the planning. Yes, it does encourage someone to get started with it." – CCMA03*		
	Budget	- *"I really think it has to do with money and time. I think that's really the main reason for not doing something." – CCWE02*	– Idea implementation	Ensures demotivation

Table 15: Detailed description antecedents within Construction Inc.

Area	Factor	Sample quotes	EDI phase	Mechanism
HR-practices	Assessment	+/- *"Look if you are just really rewarded on, assessed on the basis of the improvements you have to make that are not in the tool, or the department plan let me put it that way, yes why would you make all kinds of improvements in the incentive and the drive to implement all kinds of improvements." – DAMA01* + *"When I look at what I am assessed on, there are a number of elements that are important for my position. That I am proactive and that I indeed ensure that I am simply critical on the organization, that I put forward proposals for improvement, that I at least contribute to that continuous improvement process." – DBMA02*	Linked with 'annual team target' and 'monetary reward' + All phases	Creates an expectation and motivation
	Annual team target	+ *"We don't have that yet, but it is the plan. And that is mainly due to the urgency of the management. Soon we will really focus on the purchasing department here. For example, they have to put at least five improvement initiatives in the online suggestion system per year. Well, a number of people are responsible for that. If that doesn't happen then I don't know what will happen." – DWES01*	Linked with 'assessment' and 'monetary reward' + All phases	Creates an expectation and motivation
	Monetary reward	+ *"Does your increase percentage depend on that (individual assessment on continuous improvement)? Hey, because your remuneration and assessment are linked to salary." – DAMA01*	Linked with 'assessment' and 'annual team target' + All phases	Creates an expectation and motivation
	Training	+ *"Well, I think step one is to communicate well; 'what exactly is an improvement?' Because the word improvement is of course still quite broad. So, the Coimbee consultant has given some guidance in this. (...). And you saw that there were quite a few questions about that at the beginning." – DWES01*	Depends on: Focus of the training + Idea generation	Gaining ability and motivation
	Task composition	- *"Yes, that I have been made responsible for a number of improvement initiatives." – DAMA01*	Not included in task composition: 0 Idea development and implementation	Not included in task composition: Causes demotivation
External context	COVID-19	- *"Well, and with corona you can see that it (i.e., EDI) waters down. Everyone had different things to do at one time." – DAMA01*	– All phases	Causes experiencing impossibilities and working from home creates another dynamic which makes it harder to participate in EDI.
Organizational context	Organizational support	- *"Well, not really yet. Because the management doesn't really support it yet. To some extent, but not yet, management is not yet steering, let me put it this way." – DWES01*	No organizational support: – All phases	No organizational support: Ensures impossibilities

	Innovative culture	+ *"And the ultimate goal must be that you as an organization improve and that you just get a flat organization and that you just open yourself up as an organization. That people can help think about how we can improve an organization, process or system." – DBMA02*	+ All phases	Creates an opportunity and willingness
	Cooperation	+ *"So, I have that with, I have that the initiatives that I have put in place, I have done together with those involved. Or say, in advance sparring about how would you handle this or how we split it up? So, do you already have a list of promotions? That's how I approached it." – DAMA01*	+ Idea development and implementation	Creates opportunities, abilities, and motivation
	Number of systems present in organization	- *"On the one hand, it is a new tool. And hey that's something new. So, what you often see in employees is change. And there is, well, people in general quite quickly against it. Especially the fact that we already use about three, four or five tools. Including Relatics, including Teams, including some financial recording tools. So, you did feel that there was some resistance to that." – DWES01*	– Participation in online suggestion system	Provides resistance to the introduction of a new system and so ensures experiencing unwillingness
Managerial behavior	Supportive supervision	+ *"As a (...) manager I am responsible for a specific branch in the organization. So, everything that has to do with (...) and all initiatives that are linked to it, of course I want to monitor a bit on that. And I also want us to be proactive about it. So, from my role I will also encourage people to come up with suggestions for improvement when it comes to safety." – DBMA02* + *"And what (...) now does is just pick up those improvement proposals once a week and then put them in the system and then take the people who have indicated them, say by hand, into the system of 'dude, now you have made a proposal, how can you process that in the system?'" – DBMA02* - *"And as long as we don't hear from our managers, it will be fine, so people hide behind that too. The manager is also important if he does not have a stimulating role, then that will also demotivate. And you also have to be aware of that." – DBMA02*	Supportive supervision: + Idea generation + Idea development and implementation No supportive supervision: – Idea generation	Supportive supervision: Ensures motivation and ability No supportive supervision: Ensures demotivation and inability
	Feedback	+ *"Yes, but I have learned that you have to share with the one who makes a suggestion why you don't take a suggestion. Because it cannot be the case that every suggestion that is put forward is even taken up. There must be some sort of supervision." – DBMA02*	+ Idea generation	Getting feedback: Ensures motivation and ability
	Non-monetary appreciation	+ *"Initiatives are rewarded, there is also an improvement topper per month. Or actually a winner per month. The winner of the month, that is stated in my SharePoint who that is. That usually also goes for improvements." – DAMA01* + *"It may be because he has an interest in that himself. That is possible in the form of look, dear manager, I have saved 5,000 euros. That could be because he has a certain reward. For example, improvement of the month that he wants to achieve." – DWES01*	+ Idea development and implementation	Ensures motivation
System-related	Accessibility of the online suggestion system	- *"So far we really only have the people in the office who have access. And that is also because the people of the construction never actually sit at a computer. So, they are not actually going to spend any time on it." – DWES01*	– Participation in online suggestion system	Causes experiencing difficulties which creates unwillingness amongst employees
	Functionalities of Coimbee	+ *"Yes what I am I now what I experience now is that the very simple version is that it is just a central place where you can record improvements actions." – DAMA01*	+ Participation in online suggestion system	Overview and structure: Experiencing willingness to use Coimbee

Process-related	Physical suggestion board in addition to online suggestion system	+ *"For example, we also have a board in the organization with the option of writing down suggestions for improvement for the teams we have. And in any case to make it so accessible that we can also introduce it for the people who need it, because not everyone is equally easy." – DBMA02*	+ Idea generation	Creates opportunities
	Feeling that nothing is done	- *"Yes, that could be, this is a very broad one I think, there are people who say 'yes, but nothing is done with it'. Or and that thinking, and thinking you file a complaint, if you submit it to someone else when I input something, it will not be picked up anyway." – DAMA01*	– Idea generation	Ensures demotivation
	Seeing result	+ *"See, that's also nice when you see that it has just resulted in an effect. What if you have submitted an improvement suggestion and have successfully rolled it out." – DBMA02*	+ Idea implementation	Creates motivation
	Promotion of the online suggestion system	+/- *"Well, what you see, of course, the tool is continuous improvement, that's the core of the tool. But you also have to continuously make sure that it matters to the user, in this case the people who apply the tool in practice. And how do you do that, especially in the beginning, that is simply by structurally spending half an hour/an hour every week on that. At least that's what our approach has been. Because it must be on the agenda of the employees at the beginning. And that takes a person. In this case I was the one who makes sure that the urgency remains. And at some point, you naturally hope that they will pick it up themselves. But you can't expect your employees, who are also very busy, to suddenly set aside an hour a week out of the blue." – DWES01*	Not having someone promote: – Participation in online suggestion system Having someone promote: + Participation in online suggestion system	Not having someone promote: Causes less attention on the system, which ensures experiencing no expectation Having someone promote: Generates attention for the system, which ensures experiencing expectation
Resources	Time	- *"I think that a lot of people experience that they have too little time for it." – DAMA01*	Having no time: – Idea development and implementation	Having no time: Ensures impossibilities