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Stedin's Collaborative Path to Employee-Driven Innovation

Nikolaos Pahos [*,§], Robert Verburg [*,¶], Martin Sand [*,‖],
Stefan Uitermarkt [†,**] and Joery de Haas [‡,††]
[*]*Department of Values, Technology, & Innovation*
Faculty of Technology, Policy and Management
Delft University of Technology
Jaffalaan 5, 2628 BX Delft, The Netherlands
[†]*Bilfinger Tebodin Netherlands B.V.*
Laan van Nieuw Oost-Indië 25
2593 BJ The Hague, The Netherlands
[‡]*Stedin Group, Blaak 8*
3011 TA Rotterdam, The Netherlands
[§]*N.Pachos-Fokialis@tudelft.nl*
[¶]*r.m.verburg@tudelft.nl*
[‖]*M.Sand@tudelft.nl*
[**]*stefan.uitermarkt@gmail.com*
[††]*joeryhaas@hotmail.com*

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Abstract. Employee-driven innovation (EDI) burgeons as an important mechanism to drive the exploration activities by making the general employees responsible for innovation. However, little is known about the conditions under which EDI is most effective. To get a better understanding of EDI, we examine how Stedin, an established global player within the energy distribution industry based in the Netherlands, involves its general employees in innovation activities. Stedin actively supports EDI through strategic programmes designed to stimulate employee innovation. Our findings highlight that collaboration is a main driver of EDI at Stedin. In the early implementation phases, dynamic, heterogeneous, informal and distant collaborations are essential, while the later phases benefit from more stability and intimacy. The insights from our detailed case study provide actionable guidelines for organising EDI initiatives in practice.

Keywords: Employee-driven innovation; collaboration; development and implementation.

1. Introduction

Traditionally, the responsibility for stimulating and directing innovation within organisations has primarily rested on employees/workers within the R&D departments or specialised business units. These individuals are supposed to make

§ Corresponding author.

decisions about the direction of innovation, while the wider core of employees will then need to carry out these decisions (Kesting and Ulhøi, 2010). Over the years, a growing number of companies moved away from this traditional model of innovation and explored other possible sources of innovation outside the labs and R&D functions (Flocco *et al.*, 2022), highlighting the potential of non-R&D workers (Høyrup, 2012). This reflects an ongoing transition from the conventional top-down approach of organising innovation to a more bottom-up and distributed model that taps into the innovative potential of general employees.

The practice of enabling employees to develop new concepts and solutions has emerged as a crucial component in fostering innovation and driving business growth (Tirabeni and Soderquist, 2019) and is conceptualised under the heading of employee-driven innovation (EDI). EDI is defined as "the creation and execution of concepts, products, and procedures stemming from the interactions of employees who are not specifically tasked with this responsibility" (Høyrup, 2012, p. 8). EDI goes beyond taking occasional inspirations from non-R&D staffers (Smith *et al.*, 2012) and rather emphasises the active participation of employees in both the ideation and implementation stages of the innovation process (Björk and Magnusson, 2009). While there is much EDI evidence on how ordinary employees engage in idea generation (e.g. Axtell *et al.*, 2000), far less is known about the way employees are engaged in the implementation stage (Høyrup, 2012; Smith *et al.*, 2012). At this particular stage, a significant social element is present in innovation activities, highlighting employee interactions as a key unit of analysis due to their role in synthesising a variety of knowledge and skills (Beretta and Søndergaard, 2021).

Collaboration is key to EDI as different actors create or achieve something by sharing resources, information, risks and responsibilities (Dean, 2010). In addition, well-established structures and routines are needed to promote knowledge exchange, skill development and resource sharing (Tirabeni and Soderquist, 2019). Although the overarching relationship between collaboration and innovation seems evident, the specific dynamics still need to be clarified. Also, from a practical standpoint, the way companies may successfully implement EDI remains unclear, due to a lack of detailed case studies and practical examples. In particular, little is known about how employee engagement in various types of collaboration can be organised and facilitated and how successful collaborations can transform novel and comprehensive ideas and solutions into innovative outcomes or products. In this study, we bridge this gap by exploring how collaborative activities drive the implementation phase of EDI initiatives. Specifically, we examine how employees from different job functions and organisational levels contribute to the implementation of innovative ideas by engaging in different types of collaborative efforts. This lack of understanding could have possibly severe consequences. Some warn that such an insufficient understanding of how collaboration functions during the development and implementation phase of EDI could transform it from a driver to a barrier (Smith *et al.*, 2012).

Our study contributes to the literature in different ways while providing valuable recommendations for practitioners. First, we extend the previous work on EDI (Høyrup, 2012) by going beyond the widely investigated ideation phase (e.g. Parjanen *et al.*, 2021), and by focussing on employee participation in all innovative activities within a firm. Second, we contribute to a better understanding of the art and nature of EDI by highlighting the impact of employee collaborations. We address the call for more in-depth investigations of employee involvement in the EDI initiatives as we focus on the interactions across different levels (Flocco *et al.*, 2022). In addition, we provide a detailed illustration of collaborative EDI activities of a global player in the energy distribution industry — Stedin. This particular case offers insights in the development and implementation of EDI in practice and shows the impact on operational effectiveness, sustainability and infrastructure. As such, we respond to previous calls for further investigation of collaboration in the energy sector (Rese *et al.*, 2016). We also offer a number of practical implications that are useful for organisations in other industries or sectors.

Our findings suggest that collaboration is a primary driver of EDI and that the way people work together is contingent on the phase of the innovation process. Early implementation phases require heterogeneous, informal and more distant collaborations, whereas later phases benefit from more stability and intimacy in communication. We also show that EDI is more than just an emergent activity, but should be explicitly supported by the organisation through strategic programmes in order to stimulate innovation among general employees.

The paper is organised as follows: In Sec. 2, we provide the conceptual background of the study and present a synthesis of the existing EDI literature. Then, we present the methodology (Sec. 3), and the results of the case study (Sec. 4). We conclude with a discussion of our findings and provide the theoretical and practical implications of our study, its limitations and future research directions in Sec. 5.

2. Conceptual Background: Collaboration and Innovation

The role of collaboration in driving innovation is crucial (González-Benito *et al.*, 2016). Both internal R&D collaborations (Zhang and Tang, 2017) as well as interactions among the ordinary employees (Chasanidou *et al.*, 2018) associate with innovative outcomes such as increased innovative performance and idea development. Collaboration can be positioned under the umbrella of open innovation (Chesbrough, 2003). Specifically, organisations open their boundaries and seek knowledge internally and externally, through collaborative innovation activities, such as knowledge sourcing, users as innovators, inter-organisational alliances and other collaborations (Tirabeni and Soderquist, 2019).

The existing literature has identified certain key characteristics that appear to be critical for collaboration within innovation processes. For example, collaborations can occur in both the internal and the external organisational environments.

It is a common practice for organisations to seek sources of knowledge externally. Along these lines, establishing collaborations with other organisations and stakeholders can be valuable for innovation, especially in the early phases (Wagner *et al.*, 2021). Inter-organisational collaboration is an important supplement to intra-organisational innovative activities, as evidenced by the work of Powell *et al.* (1996). Organisations can improve their innovative capabilities by developing inter-organisational collaborations with various partners, such as suppliers, customers, universities and lead users (Faems *et al.*, 2005). This applies equally to collaborations within the realm of an organisation. Such intra-organisational collaborations refer to interactions between internal actors to achieve the common goals or objectives (da Silva Meireles *et al.*, 2022) and may support innovation activities.

Also, collaborations can be realised through both formal and informal channels (Apa *et al.*, 2021). For instance, knowledge can be shared within organisations through formal collaborative structures. Such structures enable significant resource sharing and knowledge exchange (Gupta and Govindarajan, 1986). However, informal structures play an equally vital role in encouraging collaboration and facilitating knowledge sharing through personal and professional networks. Informal structures, grounded in social interactions, trust and shared objectives, are crucial for nurturing relationships and fostering a culture of collaboration within organisations (Tsai, 2002). Scholars have previously emphasised the crucial role of informal collaborations at the implementation stage of innovation (Mignon, 2017), while others suggested more formal governance mechanisms at the beginning of a collaboration and a progressive replacement by informal ones as a result of trust-based agreements between partners (Blomqvist *et al.*, 2005).

The likelihood of succeeding with a collaboration can be also affected by the collaborating actors' diversity or homogeneity. Members of homogeneous teams find it easier to communicate and coordinate as they often have similar problem-solving approaches. This may lead to more efficiency, collaboration, innovation and performance (Watson *et al.*, 1993). In contrast, heterogeneous collaboration involves individuals with diverse knowledge backgrounds, experiences, attitudes and personalities (Guzzo and Dickson, 1996). A heterogeneous team can bring unique perspectives, knowledge and experiences to the table, which may increase creativity and problem-solving abilities.

Innovation also depends on the varying degrees of closeness and proximity in working relationships. The extent to which participants openly share core competencies and values in collaborations reflects trust and interdependence (Welborn and Kasten, 2003). This notion is also conceptualised as proximity (e.g. cognitive, technological or geographical) and has been associated with increased learning and innovative outcomes (Enkel and Heil, 2014). More intimate relationships imply a deep mutual understanding, and a willingness to share sensitive information, whereas more distant collaborations may be more transactional and focussed on specific goals. For example, face-to-face interactions are regarded as more intimate

collaborations and are a key determinant for building trust, leading to innovation performance (Wu *et al.*, 2016).

In addition, collaborations can exhibit varying degrees of stability and dynamism within a certain time span. These concepts/ideas refer to the flexibility and adaptability required for collaboration (Welborn and Kasten, 2003). Highly dynamic collaborations may involve rapid changes and frequent adjustments, while less dynamic collaborations are more stable and predictable. Collaborative relationships are seen as more stable when partners work well together as a result of mutual trust and commitment (Wang *et al.*, 2021).

Also, the dynamics and interactions between actors, where one party exercises power over another, may impact innovation outcomes. Such power relations are often depicted through hierarchical structures within an organisation and significantly influence the outcomes of collaborative innovation activities (e.g. Lahiri *et al.*, 2019). Hierarchy is inherently linked to the distribution of power and impacts the governance of information processing and decision-making but may also shape organisational members' behavioural and cognitive dynamics (Keum and See, 2014). For example, leaders in a hierarchical setting hold the power to guide, support and stimulate innovation across various stages, from problem definition to idea generation and evaluation (Smith *et al.*, 2012). Although the notion of power implies a top-down approach, which seems to clash with EDI, such "power agents" are essential for collaboration processes within the context of EDI, given that successful innovation requires the involvement of employees with different roles and decisive relevance (Jønsson and Kähler, 2022).

The current literature provides limited insights regarding the link between EDI and collaboration (e.g. Hansen *et al.*, 2017; Tirabeni and Soderquist, 2019). This lack of evidence is even more pronounced about the later stages of EDI. Examining such characteristics will provide a better understanding of how collaboration drives the development and implementation of EDI initiatives, as they can directly impact the practical realisation of innovative ideas, the collaborative dynamics among employees and the overall success of innovation initiatives within an organisation.

3. Methodology

3.1. *Case study context and selection*

EDI is commonly used across industries, such as IT, consultancy and energy (Flocco *et al.*, 2022). We chose a single qualitative case study to examine how mature companies develop and implement different EDI initiatives. We used a purposive sampling strategy to select a case providing access to empirically relevant and information-rich data (Eisenhardt and Graebner, 2007). We used the following selection criteria: (1) The selected company should be an established firm with a long competitive track record and well-established market, brand and resources; and (2) the company should be actively involved with employee-driven innovation

initiatives. Based on these criteria, we selected Stedin, part of Stedin Group, a leading energy distributor and mainly based in the Netherlands. Stedin Group focusses on constructing, managing and maintaining energy grids, employing 5,520 full-time employees (Stedin Groep, 2024). Stedin Group consists of three business units: Stedin, the grid manager operating in the regulated market and the infra partners NetVerder and DNWG, which handle non-regulated activities and account for 1.6% of the revenue (Stedin Groep, 2024). The tightly regulated environment and a history of government ownership of Stedin add complexity to the organisation's innovation management process.

Our research is particularly relevant for Stedin, which is characterised by collaborative energy innovation projects with a large involvement of stakeholders in both the ideation and the development phases of innovation (Rese *et al.*, 2016). Innovation features more and more as the focal point of strategies in relation to the energy transition. Stedin adopted and activated an EDI strategy in order to encourage its staff to share creative ideas with the ultimate aim to drive business growth and to improve customer satisfaction. Employees are particularly stimulated to think outside the box and to come up with creative solutions. This approach allows employees to demonstrate initiative and to provide suggestions and ideas in order to improve either the processes, the products or the services. Over the last couple of years, this strategy has led to several initiatives and innovations. Collaboration is crucial here, as Stedin maintains alliances and relationships with multiple stakeholders (Stedin Groep, 2024). Overall, Stedin's collaboration and innovation, together with the industry's complexity, make the research context unique for understanding how collaboration might lead to successful EDI initiatives.

3.2. *Research design*

Our research design consisted of the following phases. First, EDI initiatives that were situated within the broader context of Stedin's EDI activities were selected. Based on the previously sketched literature research, we chose to qualify an EDI initiative as a concerted effort or project undertaken by employees with the aim of developing and implementing innovative ideas, solutions or processes. In this study, EDI initiatives encompassed the inclusion of employees in both the initiation and the development and implementation phases. These initiatives were marked by the active participation of employees from various departments and hierarchical levels, as they work together and contribute their unique insights and expertise to foster innovation. Also, Stedin's EDI initiatives would fall into two categories. The first involves grassroots efforts, where employees develop and implement their ideas independently, without formal support. The second includes initiatives created within strategic EDI programmes, where employees receive structured guidance and resources to help bring their ideas to completion. We identified over 25 distinct employee improvement and innovation initiatives within Stedin.

Second, we employed purposive sampling, ensuring that these initiatives would have diverse characteristics and guarantee the most complete representation of the characteristics of EDI initiatives. As a result, we selected EDI initiatives that were classified as incremental product/process innovations, were originated by the employees from various hierarchical levels and were either ongoing or completed. We also selected initiatives that had emerged both through structured EDI programmes and organically from grassroots efforts without organisational structures put into place. We also included initiatives at various stages of implementation, ranging from early-stage concepts to fully implemented solutions, leading to a total of eight EDI initiatives. Examples of such initiatives included, among others, the development of a portable, fully equipped storage container and the implementation of a traineeship programme to solve the organisation's skill shortage. The first initiative involves a product innovation designed to meet the need for on-site availability of essential tools and materials. This solution is a portable, fully equipped container tailored for each project, improving both operational efficiency and safety. The second initiative is the development of a traineeship programme aimed at addressing the skills shortage. This hands-on, practical programme is designed for executive and technical staff, with a curriculum covering key elements of high-voltage technology, including primary components, protections, cables and lines. Following this approach, we ensured the eight initiatives included a mix of process and product innovations, featuring both grassroots efforts and those supported by strategic EDI programmes, with contributions from managers and employees in lower-level positions.

3.3. *Data collection and research instrument*

In order to further study the eight EDI initiatives, we conducted a total of 12 face-to-face semi-structured interviews with both the initiators and collaborators of these EDI initiatives. Interviews were conducted until data saturation was reached, at which point no valuable new insights were obtained from further interviews. Interview participants were selected based on their involvement in the selected EDI initiatives. To ensure a diverse range of perspectives, interviewees from different hierarchical levels, departments and roles within the organisation were included. Initiators directly involved in the EDI initiatives were interviewed and were asked questions focussed on their experiences during the innovation process, particularly the development and implementation stage.

Following the interviews with the EDI initiators, individuals who seemingly played an important collaborative role were interviewed on their experiences and contributions to the development and implementation phase of the selected EDI initiatives. This group included colleagues from the same or different departments, external collaborators and leaders or managers. Collaborators were chosen after the initial interviews with the initiators had been conducted. In that way, we were able to capture a more comprehensive understanding of the factors that influence

the development and implementation of EDI initiatives, as well as the role that collaboration plays in driving the development and implementation process of EDI initiatives. Tables A.1 and A.2 of Appendix A present an overview of our study's EDI initiators and collaborators.

3.4. *Data analysis*

The data from the semi-structured interviews were analysed using thematic analysis. Following the suggestions by Braun and Clarke (2006), the analysis was broken down into the following phases: First, the interview transcripts were thoroughly read in order to capture early impressions through anonymised summaries. Second, the transcripts were then systematically analysed to identify relevant features. At this stage, the initial codes emerged inductively from the data. Other codes were identified on the basis of the research objective and literature findings. This led to a total of 150 codes, which were then grouped into 15 distinct groups, serving as preliminary themes and providing a structured overview of the collected data. As a next step, a total of eight main themes were defined (i.e. definition of EDI and collaboration, balancing autonomy and structure, fluid collaborative characteristics at the exploration phase, structured collaborative characteristics at the exploitation phase, formal collaborative structures driving development and implementation, power relations driving development and implementation, inter- or intra-organisational collaboration and factors influencing collaborative activity) and the findings were integrated into a report, where themes were supported by relevant quotes from the participants. Table A.3 of Appendix A presents an overview of the codes, code groups and main themes used in our study.

4. Findings

4.1. *EDI development and implementation*

Stedin is a leading energy distribution company based in the Netherlands. It provides energy solutions for businesses and households, focussing on sustainability, reliability and customer satisfaction. Innovation has become a focal point in recently developed strategies for the energy transition. Within Stedin, collaboration across departments is strongly encouraged in order to ensure coordinated innovation. Stedin also strongly encourages its staff to share their ideas and creativity to drive business growth and improve customer satisfaction. Stedin's leadership has embraced EDI as a strategic means to encourage employees to think outside the box and to stimulate creative problem solving. EDI within Stedin allows employees to take the initiative and contribute their suggestions and ideas towards improving the organisation's processes, products and services. After operating for several years, the strategy has given rise to several initiatives and currently supports the launch of fresh ones.

The interviews show that the development and implementation stage of EDI can be divided into two distinct phases, namely an early phase of exploration and a later phase of exploitation. Throughout the early phase, the process is primarily led by exploration and organic growth within the organisation. The novelty and uncertainty of the emerging EDI initiative allow for creativity, flexibility and free movement as the employees explore possibilities and shape the initiative's direction as described by one of Stedin's managers: "During the initial stages, you may engage with a diverse group of people... this exploration is essential. You will have discussions, and even if they don't give you what you want, they offer clarity on what you don't want. This knowledge is valuable as you continue to explore all possible avenues."

This exploratory and organic nature gradually transitions into a more structured and stable form as the process advances. Naturally, the further the EDI initiative progresses towards implementation, the less exploratory and organic it becomes, aligning more closely with the existing organisational structures, rules and norms. A project manager of another EDI initiative stated the following: "Ultimately, you have to consider whether your small, creative team can handle it. You also have to wonder whether the operational management is ready for everyone to develop their own initiatives within their areas of responsibility. There is a need for guidance and structure...."

4.2. *Collaboration driving the exploration phase*

Results from the interviews provided four characteristics of collaboration that align with this organic EDI process at the early stage of implementation. Heterogeneous collaboration — defined as collaborative activities comprising individuals with diverse backgrounds, experiences, attitudes, knowledge bases and personalities — plays a pivotal role in the exploration phase of the EDI process. Through heterogeneous collaboration, the initiator can look through the lens of diverse perspectives which allows them to see the bigger picture of the innovative effort. This understanding broadens the scope of exploration and aids in identifying necessary actions, potential collaborators and pathways for later stages of the innovative process, enhancing the effectiveness in targeting specific needs in knowledge and other resources. For example, an operations team leader of a traineeship programme remarked: "We first looked at the exemplary figures, who have shown in the past that 'side-entrants' can successfully enter the organization. These were three people who had already been retrained. We scheduled meetings to ask them about their experiences during their first month at the company."

Simultaneously, this stage presents an opportunity to communicate and network with departments beyond one's homogeneous sphere. This is especially beneficial when those departments are likely to be impacted by the innovative idea and can assume to potentially play a role in the innovation process. A maintenance engineer involved in the development of ultrasound technology outlined, for example:

"Inventory-personnel were vital to the execution because they actually manage the innovation in practice. It is essential that we have a system within Stedin to ensure the product is in the right place and used correctly. If all the responsibility fell to me, I would be the sole point of contact, and I couldn't take up this role."

Our findings demonstrate the important role of informal, dynamic and distant collaboration characteristics in the exploration EDI phase. First, an informal collaborative structure embodies an employee's organic growth trajectory when initiating an EDI effort. In this context, the "informal" collaborative characteristic denotes emergent social interactions, mutual trust and shared objectives among individuals and departments within an organisation, despite not being an "official" organisational structure. These informal structures are not explicitly designed or recognised by higher authorities but emerge organically as individuals and departments build relationships and collaborate to achieve common goals. Additionally, one of Stedin's managers suggested that the add-in of dynamic (short-term, quick interactions) and distant (low interdependence) collaborations within an informal collaborative structure fosters a higher level of exploratory potential: "Well, you start off not knowing much. By engaging in discussions and bouncing ideas off others, you gain knowledge."

According to both a maintenance engineer initiator and a project manager collaborator, the initiator engages in quick, minimal interactions with the collaborator, launching them to gather knowledge or accomplish a specific task. Upon completion, the initiator surfaces again with the collaborator for another quick interaction. This is achieved through continuous yet brief communication, providing momentum to the early phase of the EDI process. Both interviewees mention that communication serves as a significant influential factor in this form of collaboration and that it plays a dual role: informing collaborators about the innovation journey while fostering a sense of community. However, according to one of the maintenance engineers, decision-making power remains confined, preventing a significant fraction of individuals from impacting decisions about specific stages in the process: "If you go to the formal part, then you are going to sail at someone else's pace and at the pace of the organization, whereas in this case, the innovation benefited from maintaining speed."

4.3. *Collaboration driving the exploitation phase*

The EDI implementation phase emerges as a dynamic journey that navigates from a phase of individual freedom and exploration to a more stable and structured collaborative implementation phase. According to a collaborator in a strategic EDI programme, around 15% of tasks in the innovation process can be executed autonomously and without delay. In comparison, for the remaining 85%, active collaboration is required.

A project manager involved in improving the project control manual and a maintenance engineer working on ultrasound technology discuss that the pivot

towards the implementation phase introduces the importance of transferring the different roles that exist within the innovation process. They recognise that the initiator of the innovation is not expected, nor equipped, to assume all these roles alone. Multiple participants refer to the roles in the innovation process as "the ABCDEF-roles" or "the six roles of innovation", meaning: activators, browsers, creators, developers, executors and facilitators. The inevitable emergence of uncertainty and limitations in knowledge or resources underscore the importance of role transfers for seeking guidance, consultation and additional support. This is clearly described by the engineer: "Traditionally, you can identify six roles that are crucial in an innovation process. Many people are excellent initiators, they might have fantastic ideas, but they struggle to transform these ideas into actionable solutions, implement them, communicate about them, or secure their financial sustainability. This is where assistance becomes necessary."

The need for a more structured and integrated approach for successful implementation is necessary during later phases of the EDI implementation. The organic nature of the innovation must give way to a more controlled approach, and the initial flexibility, freedom and non-committal character of EDI evolve into a process with obligations and commitments. A project manager indicates that if this transformation is to be carried out successfully, the distribution of tasks and roles across different individuals becomes a necessity, making the EDI initiative more manageable and less daunting for the initiator. So, the transference of roles is particularly critical at this stage of the process. This point in the innovation process symbolises the transition of the EDI initiative from an individual effort to an organisation-wide innovation. The autonomous character of the EDI initiative cannot be maintained indefinitely and can't remain an EDI forever; it needs to involve a growing team as sketched by an engineer: "For implementation, it is crucial to integrate everything smoothly into the existing processes and possibilities...this could mean aligning with established practices such as the BRP."

According to the initiators from different functions and levels, the delegation of tasks and transference of roles demand a form of collaboration that is both stable and intimate. The intimate (high interdependence) and stable (long-term and reoccurring) collaborative activities seem crucial factors in the execution and implementation stage of the EDI process. The intricate and specialised nature of the initiative cannot be transferred through brief, distant collaborations. Rather, a collaborator must engage over a longer period and with greater intimacy to gain the necessary knowledge and feel to assist in the successful implementation of the initiative. For example, one manager explained: "Taking people with you and involving them in that process, delegating tasks in such a way that the idea will just continue to develop. That is very intensive at the beginning and then at a certain moment, you can just let go."

Our findings also underscore that these collaborative activities, driving role transfer and the delegation of tasks in the implementation process, often occur in

relation to individuals with a similar knowledge base, shared understanding and frequently equivalent hierarchical positions within Stedin. Specifically, according to a systems engineer, the initiators of EDI initiatives often work on innovation as end users themselves. Consequently, the implementation is typically within their team or department, and the process involves their close colleagues who are often similarly matched. In addition, interviews with a team leader and a manager showed that a collaborator must dedicate time and effort in the EDI initiative in order to engage in a stable and intimate collaboration. Therefore, the same interests and goals are often a critical driver of such collaborative characteristics.

4.4. *Formal collaborative structures driving EDI implementation*

Insights from the interviews highlight the criticality of balancing autonomy, collaboration, freedom and structure in the implementation of EDI. As mentioned by an installation manager: "...actually a limited amount of cooperation has resulted in it going quite quickly. Not everyone has to make decisions about everything."

However, organisations should not aim for excessive autonomy and freedom, which can render the development process open-ended and non-committal. Employees might find themselves in unfamiliar roles or daunting tasks without sufficient support or guidance, leading to uncertainty and barriers to taking steps in the innovation process. A strategic EDI programme collaborator said: "Taking on an EDI initiative is voluntary, but it is not non-committal, because you choose to set the bar very high to try it out."

Here, collaboration and structure come into play. The right amount of collaboration and structure creates a sense of accountability and prioritisation for the EDI initiatives. It also supports managing uncertainty and facilitates collaborations to navigate complex or daunting tasks. A systems engineer showed this: "Having a structured approach would certainly have been helpful. It could eliminate the non-binding nature of the project. However, this could also diminish an important element of true innovation: the unexpected outcomes in the innovation process are just as important as the main objective."

In Stedin, formal collaborations can be described as the so-called "strategic EDI programmes". Such programmes are specifically designed to support the EDI initiatives to ensure a higher level of successful EDI initiatives. Strategic EDI programmes span all the phases of the EDI initiative to ensure a more structured EDI process without hindering the organic process and exploratory nature in the early stage of the development and implementation phase, as described by one of Stedin's managers: "I see this strategic EDI program as a means for the organic structure of EDI... it is supportive. It is a mechanism designed to continually increase momentum."

The provision of such strategic programmes can support the EDI process, particularly its exploratory face, in various ways. These include promoting accountability (as mentioned by a team leader and a project manager), establishing consistency (as mentioned by a team leader), enhancing credibility (as mentioned by a team leader and a strategic EDI programme collaborator), providing guidance and consultation

(as mentioned by two managers), establishing goal orientation (as mentioned by two managers), clarifying roles (as mentioned by a maintenance engineer), facilitating managerial support (as mentioned by a manager and a strategic EDI programme collaborator) and increasing motivation and recognition (as mentioned by a strategic EDI programme collaborator and a Business-unit director).

4.5. *Power relations and inter-/intra-collaborations*

Although Stedin is a flat-matrix-type organisation, a definite hierarchical structure exists. Accordingly, our findings show that collaborations between individuals in lower hierarchical positions and those in higher hierarchical positions are important and are often revealed through leadership and management support. Collaboration with management or leaders is often considered dynamic and distant because initiators are frequently uncertain about their importance, priority and the expected time constraints of management. This perception is influenced by the organisation's culture and is contradicted by management as the Business-unit director explained: "But what you see is that people quickly wonder, 'Am I allowed to do this, can I do this, and does he have the time for this?'... I assume the underlying thought is, 'He must be busy'. So, we make assumptions about others and that's why we don't do certain things. Like the idea of, 'Management probably wouldn't allow this.' Well, there is a way to find out; just ask. That is always difficult in an organization."

Our findings identify several managerial support efforts that may contribute to EDI initiatives, including allocating resources (as mentioned by a team leader, two managers and an operations mechanic), offering autonomy (as mentioned by a team leader, a manager, a maintenance engineer and an operations mechanic), delegating decision-making (as mentioned by an operations mechanic and a maintenance engineer), acting as liaisons (as mentioned by an engineer) and creating a sense of accountability (as mentioned by a manager and a systems engineer).

While our findings are primarily linked to intra-organisational collaborations, the dynamics of collaboration with external partners bear strong similarities to those within the organisation, with a few distinct characteristics resulting specifically from inter-organisational collaborations. A maintenance engineer and an installation manager had experiences with inter-organisational collaborations and revealed that this collaborative characteristic can potentially drive the EDI development and implementation process through two primary mechanisms: resource exchanges and the creation of accountability.

Resource exchange is a crucial catalyst for EDI since partners and external firms often possess unique knowledge, technologies or services that may not be available internally. This external influx of resources drive the development or implementation of an EDI initiative. Second, the participants argue that inter-organisational collaborations inherently entail an element of obligation, translating into the creation of accountability. Unlike intra-organisational collaborations, where the shared goals and interests within the firm often drive collaboration, inter-organisational collaborations require a value exchange that underlines their importance.

Despite this slight difference in the potential of inter-organisational collaboration driving the EDI development and implementation process, the overall dynamics of inter-organisational collaborations align closely with those of intra-organisational collaborations. Both the participants indicate that, of course there are differences, but the overall approach to the collaboration is equal, as explained by the maintenance engineer: "One of the most crucial qualities of our innovation team — and I am not sure if this applies to every innovation team — is equality. With this in mind, we consistently shared equal information with everyone around us, including those outside our team. This also applied to external partners."

5. General Discussion

5.1. *Overview of findings and theoretical contribution*

Our study supports the argument that EDI emerges in the process of social relating and that employee participation is centred around the social nature of human interaction (Mosleh *et al.*, 2024). While previous research has acknowledged the importance of collaboration, our case study offers more detailed insights into how collaboration drives the development and implementation phase of EDI in practice. We contribute to the discussion by emphasising that employee involvement in innovation should extend beyond idea generation (Beretta and Søndergaard, 2021), underscoring the critical role of collaboration for realising the EDI initiatives. In doing so, we build on and extend existing literature that links collaboration with EDI (Dean, 2010; Smith *et al.*, 2012).

Our study aligns with previous findings by showing the importance of informal collaborative structures at the earliest stages (Tsai, 2002). We also show the pivotal role of dynamism and intimacy in collaboration (Welborn and Kasten, 2003). Our study indicates that a more dynamic, distant and informal collaboration may be beneficial in the early phase, as it fosters a more flexible and fluid work environment, guiding employees effectively. Avoiding the premature or ill-timed introduction of stable and intimate collaborative traits may prevent potential resistance to change or collective decision-making, thereby averting slowdowns in the process. In this regard, organisations should encourage a culture of open communication for idea exchange (e.g. create platforms or collaboration spaces), as well as a more agile philosophy that would allow for swift responses to the industry's evolving dynamics. Also, given the importance of heterogeneous collaborations at this stage, organisations in the energy sector should facilitate the formation of cross-functional teams and collaborations with external partners.

However, the exploitation phase, which comes later and is often more specialised and complex, benefits from more stable, intimate and homogeneous collaboration patterns. As the process progresses, role transfers become vital. Recognising that an initiator cannot assume all roles throughout the innovation process, the need for collaborations to fulfil the roles of activators, browsers, creators, developers, executors and facilitators arises. Collaboration becomes more stable and intimate when

individuals share similar knowledge base, understanding and hierarchical position. This alignment enhances knowledge sharing, which in turn facilitates task delegation and role transitions. As a result, organisations should ensure that systematic assessments and reviews take place throughout the collaborative projects. In addition, diverse teams should be replaced by more specialised teams with a deep understanding of the project requirements. Our findings expand on the notion that heterogeneity plays a crucial role during the idea generation phase (Smith *et al.*, 2012), by showing that homogeneity becomes vital closer to the development and implementation phase.

Our study strengthens the conceptual underpinnings of EDI by using an interactionist perspective (Woodman and Schoenfeldt, 1990) as a theoretical lens to explain this form of innovation. While previous research has used interactionist theory to examine how personal and situational factors influence individual innovative behaviours (Wu *et al.*, 2014; Al-Ghazali, 2023), our study extends this theory to explain the impact of EDI. We show that interactions between individuals and their working conditions at various organisational levels (individual, group and organisation) foster creative behaviours essential to EDI. EDI is uniquely shaped by the active involvement of employees across multiple phases of the innovation process, requiring ongoing, adaptable collaboration as ideas progress towards implementation. This dynamic interplay between personal and contextual factors drives employee creativity (Zhang *et al.*, 2018) and ultimately enhances innovation outcomes (Fan *et al.*, 2020). Specifically, our findings show that EDI depends on a balance between informal and formal structures (Tsai, 2002) and the alignment of employee autonomy with organisational structure (Smith *et al.*, 2012). Also, the adaptability of EDI within specific industry demands and organisational structures, emphasise that the interactionist theory should account for industry-specific and structural constraints to fully understand innovation processes (Flocco *et al.*, 2022). This goes beyond prior theoretical works by showing that EDI's success depends not only on individual contributions but also on the alignment of industry context, organisational structures and multi-level leadership dynamics.

5.2. *Implications and future research*

Overall, for practitioners, management support and collaborative structures are the cornerstone of a successful EDI trajectory. Organisations in the energy sector should ensure that such collaborative activities are accessible and culturally accepted. Also, managers and leaders should foster a supportive environment that encourages employee's innovative behaviours (Lim *et al.*, 2024), leveraging employees' knowledge, skills and experiences in the workplace (Bäckström and Bengtsson, 2019). Specifically, managers need to be active facilitators of innovation by allocating resources, actively supporting new ideas and granting autonomy. An efficient balance between autonomy and structure can be achieved by integrating formal collaborative structures like the strategic EDI programmes. Our findings support the notion that interactions between employees and managers constitute a significant unit of analysis for EDI as being a social and collaborative process (Bäckström

and Lindberg, 2019). Our study indicates that strategic EDI programmes are vital for EDI development and implementation and embody both formal collaboration structures and mitigation of power relations. This insight might prompt organisations to re-evaluate their current structures and better support EDI initiatives through the incorporation of strategic EDI programmes and formal structures, while not interfering with the organic pathway of these EDI initiatives.

This paper is not without limitations. Our research focussed on a single case study within a single organisation in the energy distribution sector. This raises concerns about the generalisability of our results. Also, the relatively small number of selected initiatives and the lack of focus on inter-organisational collaborations limit the robustness of our findings. Future research could be enriched by more qualitative inquiries across multiple firms and industries to enhance our findings' generalisability and establish possible contextual differences. Also, future ideas could focus on implementing specific management practices with a collaborative nature [for instance, Collaborative HRM practices, see Hong *et al.* (2019)] or on how digital collaboration tools (Opland *et al.*, 2022) may drive the execution of EDI initiatives.

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Appendix A

Table A.1. Overview of EDI initiatives and initiators.

Initiator	EDI initiative	Status	Type of innovation	Level of EDI
Team leader, operations	Traineeship as a new talent pipeline	Complete	Process	Strategic EDI programme
Manager	Establishing an in-company training and learning facility	Complete	Process	Grassroots level
Systems engineer	SA-System improvement	Complete	Process	Strategic EDI programme
Project manager	Improving the project control manual	Current	Process	Strategic EDI programme
Operations mechanic	Storage containers/workplace containers	Complete	Product	Grassroots level
Maintenance engineer	Ultrasound technology	Complete	Product	Strategic EDI programme
Installation manager	Investigating magnetic coating to reduce energy loss	Current	Product	Strategic EDI programme
Engineer	HoloLens integration	Complete	Product	Strategic EDI programme

Table A.2. Overview of collaborators in EDI initiatives.

Collaborator	Role in the EDI process
Project manager	Involved in the development and implementation of the storage/workplace container initiative
Trainee	Involved in the development and implementation of the HoloLens initiative
Strategic EDI programme collaborator	Involved in various EDI initiatives coming from a strategic EDI programme
Business-unit director	Involved as a managing director in various EDI initiatives

Table A.3. Overview of codes and themes.

Codes	Code groups	Main themes
Work-related, accessibility for collaboration, acting as a client, action-driven idea implementation, adaptability and flexibility, anticipation on change, autonomy, available capacity, avoid ignorance, bottom-up, building blocks, channelling thoughts, collaborative structure, collaborative tools, commitment, communication, complexity, confidence in idea, conflicting goals, cooperation, creating accountability, creating consistency, creating goodwill, creating support, creation of value, culture of innovation, deadlines, decision-making power, decision-making structures, definition of collaboration, task delegation, determination, development process, distant collaboration, task division, dynamic collaboration, engineer, enhanced credibility, enthusiasm, equal treatment, evolving collaboration, expected outcome, experience, exploration, external confidence for idea, external partner, focus, formal collaboration, freedom, guidance and consultation, heterogeneous collaboration, homogeneous collaboration, honesty, idea, idea generation, implementation and innovation, implementation process, increasing efficiency, incremental innovation, indecisiveness, individual hierarchy, individual traits, informal collaboration, innovation as a process, insufficient involvement, inter-departmental collaboration, inter-organisational collaboration, intimate collaboration, intrinsic motivation, knowledge transfer, learning effects, liaison, management support, mandate, mentor, minimal collaboration, motivating, necessity for change, network effects, new ideas, no business case, no concrete goals or tasks, organisational vision and goals, operational, opportunity recognition, organic growth path, organisational chart, organisational	Barriers of collaboration Barriers of EDI implementation and development Collaborative characteristics Definition of collaboration Definition of EDI Drivers of collaboration Drivers of EDI implementation and development Essence of idea Individual characteristics for collaboration Individual characteristics for EDI development and implementation Innovation process Mediator for collaborative activity	Definition of EDI and collaboration in the context of the organisation Balancing autonomy and structure Fluid collaborative characteristics driving the exploration phase Structured collaborative characteristics driving the exploitation phase Formal collaborative structures driving EDI development and implementation Power relations driving development and implementation

(*Continued*)

Table A.3. (*Continued*)

Codes	Code groups	Main themes
structure, organisational priorities, organisational responsibilities, participation, persistency, personal awareness and limitation recognition, personal work limits, potential recognition, power relations, power relations (same hierarchy), power relations as barrier, practical users, problem emergence, problem resolution, process innovation, promoting, providing feedback, radical innovation, realisation of the benefits, remove barriers, resistance to change, resource allocation, resource exchange, result and action-driven, result-based interactions, role ambiguities, role responsibility, roles in the innovation process, seeking support and guidance, sense of community, sense of responsibility, shared goals and interest, significance of the company, slowing down, small process steps, smooth integration, speed, sponsorship, stable collaboration, stage gate process, stakeholder management, status, strategic collaboration selection, strategic EDI programme, structured development and implementation process, successful implementation, taking initiative, team leader, tenacity, thinking ahead, time, trial and error, transfer of roles, transfer of roles — definition of EDI, trust, uncertainty, value recognition, willingness	Mediator for EDI implementation and development Role in organisation Type of innovation	Inter- or intra-organisational collaboration for EDI Factors influencing collaborative activity in the EDI process

ORCID

Nikolaos Pahos https://orcid.org/0000-0003-1418-5627
Robert Verburg https://orcid.org/0000-0002-5805-8737
Martin Sand https://orcid.org/0000-0001-8167-4581

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