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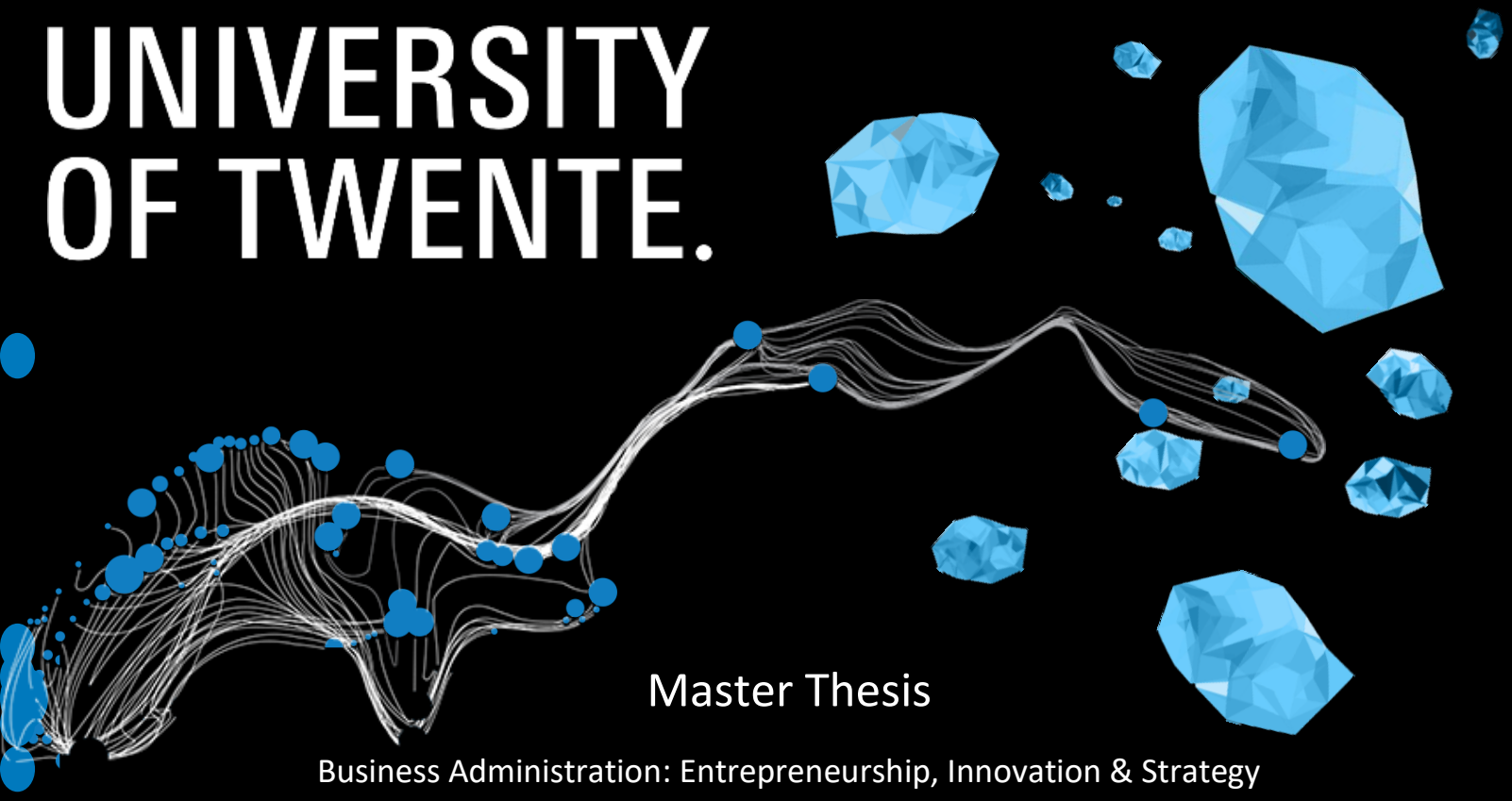
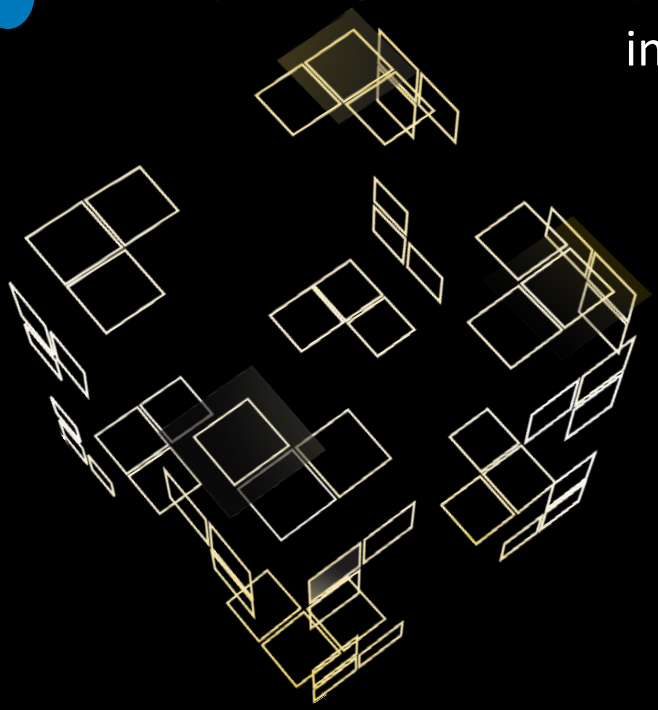
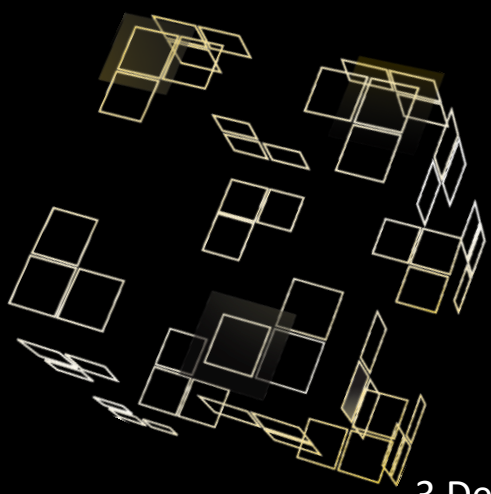


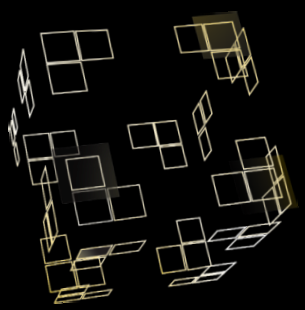
Master Thesis

Business Administration: Entrepreneurship, Innovation & Strategy

# Improving innovation performance through employee-driven innovation routes







Koen Boertien, s1749854

3 December 2019

**Colophon**

MASTER THESIS

# Improving innovation performance through employee-driven innovation routes

A Thesis in the Field of Employee-Driven Innovation

for the Degree of Master of Science of Business Administration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Enschede, The Netherlands December 2019

# Abstract

**Purpose** – Recent research on employee-driven innovation (EDI) has tried to explain how EDI emerges through innovation routes. However, there is little knowledge on which instruments can be used to support radical innovations through EDI routes in the aim for innovative performance of organizations. Therefore, the purpose of this research is to explore how EDI routes emerge and taken together with the abilities, motivation, and opportunities (AMO) framework investigate which instruments can influence EDI routes towards enhanced innovative performance.

**Design/methodology/approach** – In this qualitative research, an in-depth case study at a Dutch housing association is conducted based on 17 interviews from a multi-actor perspective, documents on innovative strategy, and observations.

**Findings** – The results provide insights on how EDI routes emerge at the housing association through three phases consisting of activities that shape those phases, and illustrate which ability, motivational, and opportunity enhancing instruments have influence on the phases within such EDI routes.

**Practical implications** – The results of this research provide practice with information for (HRM) professionals that aim to improve the innovative performance driven by employees.

**Originality/value** – An aggregated model is presented to clarify propositions and which instruments can be used to stimulate work-floor employees to contribute to innovative performance through EDI routes.



**Keywords** – Employee driven innovation, innovative performance, AMO framework, work-floor employees, EDI routes, innovation routes, instruments for stimulating employees

# Preface

This master's thesis is the result of 7 months of research at the University of Twente. With this report, the studies of Entrepreneurship, Innovation and Strategy has come to an end. A study which has really broadened my paradigm on the world and a journey which helped me to look with a more holistic view to Business Administration related topics in practice.

The time in which I did my research has been a great but also a frustrating experience as it took a lot more time and energy than I had calculated from the start. I came across myself in practices I was not good at which resulted in time-losses and a master thesis project I was not able to finish at first. On the other hand, through these 'failures' I learned to accept my deficiencies and search for help and going back to relevance once a while, which problems otherwise may have crossed in a later stage in my career at greater losses. The research topic EDI has become a part of my passion on the way in which it has shown new opportunities on entrepreneurship and how it could help the world to be a better place. Since the start, I have studied this topic diligently and quickly found opportunities to inspire people during conversations with all sorts of organizations to give more attention to 'ordinary' employees who can help organizations grow so much.

I am truly grateful that trust and freedom was given to me during the process of conducting research. I have learned of my time during my masters in what I am capable of, what I want to do, and also important what I don't want to do. I have experienced a lot of help and support from counseling staff of the BMS faculty as well as from my parents and my brother for which I want to thank them very much. Furthermore, I want to thank my girlfriend Nienke for being so supportive and facilitating while I was struggling with motivation and planning.

My special thanks go out to my supervisor from the University of Twente. Maarten Renkema, you helped finding my confidence on my abilities back. Thank you for your endless patience and the almost unhuman quick but qualitative feedback you provided. You motivated me with emphasizing the importance of this topic and opened up for personal bonding which helped me to finish the thesis for which I thank you. Also, I thank Anna Bos-Nehles for making time to be the second examiner and making my day at our first encounter.

I would also thank the case-study organization contact person for giving the opportunity and facilitating whatever I needed to complete this thesis. Interviewees, thank you for your warm welcome and openness during the conversations. I appreciated that I was able to execute my interviews with a fast pace. I could not have done this without your help and fast response.

To the reader, I hope that you will enjoy reading the thesis which lies before you. I wish that this thesis may inspire you.

Enschede, December 2019

# Table of Contents

# List of Tables

# List of Figures

# 1. Introduction

In the world of today, innovation is an inseparable term in all fields of business research. More specifically, innovation performance is crucial for organizations to achieve long-term performance and secure their existence (Anderson, Potočnik, & Zhou, 2014). Innovation mostly refers to the development of new technologies or the work of research and development (R&D) departments. Among other innovation sources, a relatively understudied source of innovation emphasizes the use of firms' most important assets: their own employees (Høyrup, 2010; Maselkowski & Grottenthaler, 2014). Researchers increasingly investigate the contribution of employees as driving factor for innovation performance of organizations (Bos-Nehles, Renkema, & Janssen, 2017; Jiménez-Jiménez & Sanz-Valle, 2008; Mumford, 2000; Shipton, West, Dawson, Birdi, & Patterson, 2006). Employees' innovative behaviors are the cornerstone of the innovativeness of organizations and can be stimulated by HRM to gain such employee involvement in organizational innovation processes (De Leede & Looise, 2005; Kesting & Ulhøi, 2010).

Till now, a variety of employee innovative behavior concepts are studied. For instance, innovative work-behavior (IWB), high-involvement innovation, and employee-driven innovation (EDI). Despite for some fundamental differences, these concepts are closely linked with each other (Kesting & Ulhøi, 2010). IWB is based on the work of Scott & Bruce (1994) 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). The IWB literature has provided insight on how innovative behavior of individual employees transforms into innovation; how this behavior can be stimulated; and that innovative behavior is indeed positively related to organization-level innovation outcomes through innovative idea generation (Fu, Flood, Bosak, Morris, & O'Regan, 2015). However, IWB literature lacks information on the innovation content and activities itself. The literature of EDI covers a broader definition of activities regarding innovations. IWB is an important component which is used as input in the EDI literature. Renkema, Meijerink, & Bondarouk (2018) describe the EDI concept as "*[…] the generation and implementation, across organizational levels, of new ideas, products, services, and/or processes originating from work-floor employees who are not overtly required to be active in these activities"*. This definition emphasizes the bottom-up development of innovations strongly. Furthermore, EDI is stressed as a concept that can bridge IWB at the individual level with innovative outcomes at the organizational level. Although, researchers have studied both IWB and EDI constructs extensively, there is no sound explanation how innovative ideas at an individual level channel through innovation processes into collective innovative performance.

Previous research has served current knowledge with widespread insights (Bos-nehles, Bondarouk, & Nijenhuis, 2016; Jiang, Lepak, Hu, & Baer, 2012; Mowbray, Wilkinson, & Tse, 2015; Shipton et al., 2006; Zhou & Fan, 2019). First, employees potentially complement the information deficit of managers. Decisions on innovations are stressed to be imperfect as managers often possess wrong or incomplete information about current routines at the operational level and are usually not part of the informal socialized day-to-day business with internal staff, customers and/or suppliers (Garicano & Rayo, 2016; Reber & Lewis, 1977). It is emphasized by Kesting & Ulhøi

(2010) that employees are endowed with in-depth and highly context dependent knowledge on day-to-day operations; have the same potential to be creative individuals as anyone else; and possess relevant network contacts for potential sources of knowledge and ideas. Through utilizing these factors correctly, organizations can benefit from the information supplements in the decision making of innovation processes. Second, by providing employees with time and resources, innovation opportunities which are worth spending management capacities on will be identified. Third, employee participation in innovation processes requires a certain framework including management support, the creation of an environment for idea creation, a well-defined decision structure, a reward system and incentives, etc. (Amabile, Conti, Coon, Lazenby, & Herron, 1996; Amabile, Schatzel, Moneta, & Kramer, 2004; Madsen & Ulhøi, 2005; McLean, 2005; Perry-Smith & Shalley, 2003). Furthermore, it is generally accepted that human resource management policies and practices positively affects the overall level of innovation in organizations (Bos-Nehles et al., 2017; Jiménez-Jiménez & Sanz-Valle, 2008). Nevertheless, the question of how employees can contribute to innovation across organizational levels remains understudied.

Recent studies have tried to explain how idea generation at the individual level develops towards organizational-level innovation. To describe this phenomenon, scholars have studied the emergence of EDI through enabling processes. An EDI emergence model is proposed in which the assumption is made that HRM, as a part of the EDI construct, enhances the emergence of innovation (Renkema et al., 2018). In line with this model, it becomes clear that for example, innovation channels, project teams, and frontline leadership are important for defining innovation routes. The inductive model of HRM and EDI emergence by Renkema et al. (2018) also shows that innovation routes are important because they help increase the chance of successful developments of innovations. However, there is little knowledge on which instruments can be used to influence innovation routes such that the chance of successful innovation development can be increased. Recent work implies that combinations of static constructs such as IWB, EDI, and HRM lack a clear dynamical framework (Fulmer & Ostroff, 2016; Kozlowski & Chao, 2012; Kozlowski & Klein, 2000). By investigating which instruments influence innovation routes within such a dynamical framework, we enable to find which instruments influence organizational innovative performance. Furthermore, although research has focused predominantly on determinants that influence the innovative behavior to engage employees in innovation processes (Bos-Nehles et al., 2017; Kesting & Ulhøi, 2010; Malhotra et al., 2019), there is insignificant understanding about how contextual factors influence work-floor employees to actively bring their innovations forward. For example, Bos-nehles et al. (2016) identified that workplaces that stimulate innovative behavior often find difficulties in engaging employees in the realization of innovative ideas. Another relevant research gap is the unfamiliarity of how radical innovations influence employee-driven innovation routes because existing studies on employee involvement in innovations are more related to incremental innovations (e.g. Bos-nehles et al., 2016; Renkema et al., 2018). For this reason, research should focus more on the implementation phase of employee-driven innovations and on the more radical nature of innovations.

This study aims to explore how employee-driven innovation routes can be influenced for improved innovation performance. In doing so, the concept of innovation routes is combined with the ideas of EDI emergence

and the ability, motivation, and opportunity (AMO) framework. Also, we include employees from all hierarchical levels, especially work-floor employees who have no particular task for innovation. This study is conducted through an in-depth single case study in an explorative qualitative research design at a Dutch housing association. To achieve the abovementioned the following research question arises: '*Which instruments do organizations use to stimulate work-floor employees to contribute to innovative performance through employee-driven innovation routes?'*

The thesis starts with a theory chapter conceptualizing EDI emergence and innovation routes in the context of work-floor employees. Second, the methodology in chapter three sets out the research design where it is described how the research is set and the methods used to obtain all information for answering the research question. Third, the results of a single case-study at a Dutch housing association are presented, to gain knowledge on EDI emergence through innovation routes and the supportive instruments through which innovation routes are successful. The thesis is finalized with a discussion and conclusion part on the theoretical and practical implications.

# 2. Theoretical background

In this section the theoretical background of this research is discussed. First, we describe the concepts of Innovative Work Behavior (IWB) and Employee-Driven Innovation (EDI). Next, further development of EDI in the form of an emergent process is introduced as well as innovation routes within EDI emergence are explained. Finally, the result of this section is a theoretical lens which defines the framework of this research.

## 2.1. Innovative Work Behavior (IWB) and Employee-Driven Innovation (EDI)

So far, scholars have investigated IWB in different contexts which resulted in different definitions of IWB. Table 1 shows descriptions on and main differences between several IWB definitions. The definitions particularly deviate on the basis of 'behavior' and 'action'. *Behavior* is viewed as an automatic, subconscious and reflexive activity while *action* is rather defined as an intentional, conscious, purposive and subjectively meaningful activity (Von Mises, 1949). When looking into the meaning of IWB, 'behavior' implies that employees should behave innovatively in a more or less automatic and subconscious way. However, when employees are acting more consciously in the aim for innovative behavior, there is a various of stimuli and inputs which can over time alternate innovative 'action' through learning to form innovative employee 'behavior' (Montag, Maertz, & Baer, 2012; Shipton, Sparrow, Budhwar, & Brown, 2017).

IWB is a necessary yet not sufficient variable for explaining the collective-level organizational innovation output. A direct effect of IWB is idea generation as employees are motivated to share knowledge on their ideas (Andreeva, Vanhala, Sergeeva, Ritala, & Kianto, 2017; Kuvaas, Buch, & Dysvik, 2012). However, idea generation may not transform into innovations necessarily (Baer, 2012; Høyrup, 2010). Idea generation is considered an innovation phase driven by creativity which is more related to individual employees whereas later phases such as the implementation phase involves a collective effort of a group (Axtell et al., 2000; Shipton, Lin, Sanders, & Yang, 2017). Therefore, IWB is rather an individual-level construct (Bos-nehles et al., 2016; Damanpour, 1991; De Jong & Den Hartog, 2010; Montag et al., 2012; Scott & Bruce, 1994a). Furthermore, IWB is a 'variance theory' that explains phenomena in terms of relationships of dependent and independent variables. However, we aim for a better understanding how innovations emerge in this research. Therefore, a 'process approach' is more valid as it provides explanations in terms of the sequence of events leading to the collective-level innovations (Langley, 1999; Mohr, 1982). EDI is such a process approach in which IWB is only a part of the EDI process towards innovation. Bos-Nehles et al. (2017) addressed that future research needs to focus on how individual IWB affect the collective-level innovation output at the organizational level. Therefore, EDI is a well-suited alternative or even a supplementary construct that goes well-beyond the limitations of the IWB construct.

| Definition | Main differences | Reference |
|---|---|---|
| "All individual actions directed at the generation, processing and application/implementation of new ideas regarding ways of doing things, including new product ideas, technologies, procedures or work processes with the goal of increasing the organizational effectiveness and success". | Benefits to the 'individual, group or organization' is contradictory as outputs which are fully beneficial to the organization, may have a chance of prejudice against the individual or the group and vice versa.<br><br>This definition includes, in contrast to the second definition, three dimensions under which: idea generation, processing of the ideas, and idea implementation. | (Bos-Nehles et al., 2017) inspired by Kleysen & Street (2001) and Yuan & Woodman (2010) |
| "The intentional behaviors of individuals to produce and implement new and useful ideas explicitly intended to benefit the individual, group or organization". | The definition is broader than the first definition in the sense that 'to benefit the individual, group or organization' is a less explicit goal than 'increasing the organizational effectiveness and success'.<br><br>the former definition consists of an emphasis of individual actions in the aim for a collective goal, where in the latter also behavior of individuals towards their own interest may be included. | (Bos-Nehles et al., 2017) |
| the actions of individual employees focused 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" | This definition is very close to the second definition despite for the inclusion of the dimension of 'introduction' as the aforementioned 'processing of ideas' into the definition. The authors indicate the importance of the follow-up phase after the creation of the idea itself as introducing the idea or promoting the idea before the implementation process starts. | (Renkema et al., 2018) inspired by Janssen (2000) and Scott & Bruce (1994) |
| "all employee behavior directed at the generation, introduction and/or application (within a role, group or organization) of ideas, processes, products or procedures, new to the relevant unit of adoption that are meant to significantly benefit the relevant unit of adoption". | emphasized by this definition is that it covers both incremental and radical innovations. However, this definition especially comprises the collective effort of 'all employees' while previous definitions mentioned the importance of the innovative behavior on the 'individual' level to describe IWB. | (De Spiegelaere et al., 2012) |

*Table 1: Definitions of IWB and main differences of IWB definitions*

The concept of EDI exists when employees are the key driver behind innovations from a bottom-up perspective. The field of research elaborates on the assumption that every single employee can be a source of innovation (Evans & Waite, 2010). Moreover, work-floor level employees have knowledge and experience from the day-to-day working environment which means that they are actually crucial to get involved in new solutions towards technology, markets, and the organization (Axtell et al., 2000; Ellström, 2001; Wihlman, Hoppe, Wihlman, & Sandmark, 2014). To utilize this source of knowledge, EDI requires employees to engage more actively and systematically in change processes (Høyrup, 2010; Kesting & Ulhøi, 2010; Kristensen, 2013; Rocha, 2010; P. Smith, Ulhøi, & Kesting, 2012).

Based on the definition of Kesting & Ulhøi (2010) and Høyrup (2010) EDI is defined 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"* (Renkema et al., 2018). The definition includes the idea generation and idea implementation dimensions in line with the research of Dorenbosch, Engen, & Verhagen (2005). However, what especially is of great importance from the definition by Renkema et al. (2018) is the inseparability of these dimensions. The EDI concept can best be viewed from the perspective where EDIs are the actual innovations that are the result of an idea emerging from an employee who

is not considered to have specific innovation related tasks. Simultaneously, this means that ideas from ordinary employees which are not eventually converted into innovations are not considered EDIs. This indicates that EDI goes well beyond the idea generation alone and even has a larger emphasis on the implementation of novel ideas. We point at the fundamental difference between the concept of IWB and EDI. IWB is a behavioral construct focused on the idea-generating phase as well as it emphasizes the importance of considering execution of follow-up phases. In contrast, EDI views innovation as direct output whereas IWB is the input.

Furthermore, EDI goes beyond the regular job description of regular employees. Scholars use many names when referring to 'employees', such as 'normal', 'ordinary', 'regular' employees. Often, the distinction of managers and employees is indicated with decision making authority. More specifically, Kesting & Ulhøi (2010) defines the authority on innovation as *"the right and duty, to make decisions about innovations"*. This authority is typically assigned to a small fraction of employees with specific job functions within the organization. The majority of individuals within an organization are excluded from decision making on innovation (Kesting & Ulhøi, 2010). Individuals who have been assigned to make decisions on innovations are further referred to as managers, and those who do not have this kind of decision-making authority are referred to as employees. Furthermore, individuals can be either strategic in top management, administrative as a manager, or operational on the shop-floor which also holds for service organizations (Hartman, Tower, & Sebora, 1994). As service organizations typically do not have a shop, the name of work-floor employees suffices better. Work-floor employees are ideally positioned as they face complex issues providing them with insights on what the organization can improve which in turn can be transformed in innovative solutions (Skaggs & Youndt, 2004; Wihlman et al., 2014). The knowledge and resources of work-floor employees are in-depth, dependent on context, and technically detailed which is often lacking at the management level (Høyrup, 2012; Kesting & Ulhøi, 2010). Mixed with the creative potential, individual work-floor employees make a well-fitting potential driving force behind innovation.

## 2.2. EDI emergence

In line with Høyrup (2012), we see EDI as a process of emergence in which individual characteristics merge into a higher-level collective outcome (Sundbo, 2003). Nevertheless, innovation cannot emerge without conversation, sharing of ideas, and collaboration (P. Smith et al., 2012). Individual characteristics such as affections, (innovative) behavior, and cognitions are amplified through social interaction and coordination (Allport, 1954; Katz & Kahn, 1978; Renkema et al., 2018). As such, IWB on the individual level can deliver high quality innovations on the organizational level through social interaction. However, the emergence of an idea into an innovation is a rather complex and dynamic process. In line with Kozlowski & Klein (2000), EDI is argued to have emergent properties as when individuals interact, share and exchange knowledge, it manifests into the collective phenomenon: innovation (Renkema et al., 2018). The emergent characteristics of EDI allow this research to leave the static nature of the IWB and EDI construct and start viewing EDI as a holistic and dynamic process (Kozlowski & Chao, 2012).

Emergent processes have long been researched to describe how a higher-level phenomenon derive from lower-level elements (Fulmer & Ostroff, 2016; Zohar & Luria, 2004). Now the investigation of emergent processes finds its ways to the topic of bottom-up innovation (Renkema et al., 2018; Shipton, Sparrow, et al., 2017). Emergence has first been reviewed as 'a whole that is more than the sum of the parts', where a combination of entities or parts create new entities which are composed more complex with new qualities due to the coalescence of the parts (Ablowitz, 1939). As numerous definitions of emergence have been developed since, there are four commonalities to be found according to Fulmer & Ostroff (2016). First, the process of emergence creates a higher-level 'whole' deriving from individual 'parts' in a social system. Second, there is a certain level of interaction between the individual 'parts' in the system. Third, interaction fosters new patterns or forms to emerge from the individual elements of the system to a collective-level phenomenon. Lastly, emergence is stressed as a dynamic process occurring over time. From the emergent theory, Fulmer & Ostroff (2016) distinguish three foci: (1) the lower-level elements and their content related areas such as cognition and learning, perceptions, affect, attitudes, and behaviors; (2) emergent factors facilitating the convergence such as structure, leaders, social processes, and homogeneity; and (3) the emergent property target which can be the self, the other, or the context such as a task, a team, or the organization.

Applying EDI on the emergent theory of Fulmer & Ostroff (2016) outlines a framework for EDI emergence. Freely interpreted, EDI as an emergent process comprises that the content areas of the individual work-floor employees as the lower-level elements coalesce through emergent factors towards the collective-level emergent property which is innovation as outcome. This interpretation is further elaborated by Renkema et al. (2018) who identify three features specifically for the emergence of EDI namely content, process and structure. First, the content is described as the outcome of the content areas forming the innovative ideas at the individual employee-level. This phenomenon of the content areas of the lower-level element can also be seen as the IWB construct which has innovative ideas directed to organizational-level innovation as outcome (Ostroff, Kinicki, & Muhammad, 2013). Second, the process of EDI emergence stresses the dynamic interaction process among individual employees and patterns which occurs over time that is required for the implementation and coalescence towards the higher-level innovative outcome (Kozlowski & Klein, 2000; Ployhart & Moliterno, 2011). Third, the EDI structure is considered to be contextual factors such as formalization and HRM practices that form both the process and the content of EDI (Renkema et al., 2018). In line with this research of Renkema et al. (2018), we suggest that the process feature of EDI emergence consist of different routes through which employee-driven innovations emerge.

## 2.3. Innovation routes and EDI

EDI emergence represents a continuous interplay of interaction between actors of an innovation process. Innovation routes could help structure and support the innovation process from a bottom-up perspective.

Innovation routes is a topic that is not extensively researched yet. Especially, in the EDI topic this phenomenon is rarely mentioned as well as EDI emergence is still in its infancy.

Innovation routes are structures through which innovations are developed from idea generation to idea realization. Every innovation emerges through such an innovation route. However, when the concept of EDI is introduced, innovation routes occur in the form of a bottom-up approach. Organizations do usually use several innovation routes which are embedded in the overall innovation process. Whereas the innovation process is a standardized process, innovation routes may run different each time dependent on the context of the innovation. Renkema et al. (2018) identified three key innovation routes that represent the bottom-up emergence of innovations: the organizational route, the formalized-system route and the project-initiative route.

From the point of view that EDI routes are dynamic, we suggest that it is not desirable to specify all contingent EDI routes, but use process theorizing instead to penetrate the logic beyond normative innovation-process models (van de Ven, 1992). EDI routes consist of a sequence of events leading to innovation that is rather complex. Understanding patterns of ordering and interaction in such a sequence of events are important (Mohr, 1982). The most common identified pattern in literature is the linear sequence of 'phases' that describes events at a certain time following up on each other (e.g. Burgelman, 1983; Langley, 1999; Rogers, 2003). However, other authors stress that organizational processes often show divergences from the main route as changing contexts, feedback loops, and non-linear relationships exist in these processes (Mintzberg, Raisinghani, & Theoret, 1976; Nutt, 1984; Schroeder, Van de Ven, Scudder, & Polley, 1989). As such, the sequence of events is no longer linear, but is cycling through phases and parallel processes. Therefore, we use routes to identify how non-linear relationships of phases in a bottom-up innovation process emerge in different contexts.

Renkema et al. (2018) emphasize that innovations emerge through different EDI routes dependent on the elemental type and content of the idea of an employee. However, the emergence of EDI through innovation routes can be supported and constrained by mechanisms such as HRM policies and underlying HRM practices. It is stressed that specific HRM practices affect the content of EDI emergence and the process of EDI emergence or both. For example, the HRM practice 'reward' is a top-down stimulation factor that affect the content of EDI emergence as it increases the likelihood that new ideas are being generated by employees. Also, 'feedback' is an HRM practice that enables the process of EDI emergence by bottom-up championing. We aim to investigate which contextual factors influence how EDI routes are structured throughout EDI emergence.

## 2.4. Contextual factors influencing EDI emergence

Scholars have extensively investigated the factors which influence IWB and EDI (Bos-Nehles et al., 2017; Kesting & Ulhøi, 2010; Malhotra et al., 2019). Especially HRM research has provided insight in how to influence employees to engage in innovative processes. Renkema et al. (2018) stress that HRM activities are contextual factors that influence EDI emergence. Indeed, these contextual factors are broad and are assumed to have lots of

smaller contextual elements underlying which may be identified throughout the empirical results of this research. Therefore, the contextual factors will be categorized as HRM policies functioning as support mechanisms in the aim for finding underlying support instruments.

It is largely been accepted to use the ability, motivation, and opportunity (AMO) framework by Appelbaum, Bailey, Berg, Kalleberg, & Cornell (2000) to explain the linkage between HRM and organizational performance (Bello-Pintado, 2015; Boselie, Dietz, & Boon, 2005; Ehrnrooth & Björkman, 2012a; Marin-Garcia & Tomas, 2016). Bos-Nehles et al. (2017) and Shipton et al. (2017) identify these three HRM policy-areas of the AMO framework that enable employees to engage in innovative processes. The AMO framework is based on the assumption that discretionary effort of employees requires necessary skills, appropriate motivation, and the opportunity to participate in order to enhance employee performance (Bailey, 1993). We identify that performance is influenced by practices underlying the AMO framework. Such practices may be used and bundled in various configurations dependent on the context and on the subjective perceptions of employees (Boxall & MacKy, 2009; Ehrnrooth & Björkman, 2012; Lepak, Liao, Chung, & Harden, 2006). First, the ability dimension of the AMO framework is usually defined by knowledge, skills, and abilities of an employee (Fu, Flood, Bosak, Morris, & O'Regan, 2013). More specifically, an ability directed policy-area aims to improve the knowledge, skills, and abilities of individual employees. For example, using instruments such as learning and training as well as recruitment techniques organizations could influence the overall abilities of their human resources (Evans & Waite, 2010; Knol & Van Linge, 2009; Kroon, Van De Voorde, & Timmers, 2013; Pratoom & Savatsomboon, 2012; Raidén, Dainty, & Neale, 2006; Zhang & Begley, 2011). Second, the motivation dimension is about enhancing performance through influencing extrinsic or intrinsic motivation of employees such that they may feel obliged to reciprocate through discretionary effort. Examples of instruments that are used for this are financial and non-financial rewards (Bakker & Demerouti, 2007; Bommer & Jalajas, 1999; Bos-Nehles et al., 2017; Bysted & Jespersen, 2014; Janssen, 2000; Ramamoorthy, Flood, Slattery, & Sardessai, 2005). Third, the opportunity dimension is indispensable in the AMO framework as it gives means to the ability and motivation dimension. For instance, instruments such as autonomy, job design, involvement, and knowledge sharing may be used to enable opportunities for employees who are motivated to use their abilities (Blau, 1964; Bysted & Jespersen, 2014; Deci & Ryan, 1985; Gagné & Deci, 2005; Gerhart, 2005; Janssen, 2005; Kroon et al., 2013; Napier & Nilsson, 2006; Ohly, Sonnentag, & Pluntke, 2006).

Particularly interesting in this framework is the cohesiveness between those three policy-areas. That is, abilities, motivation, and opportunities are all required to some extent as the lack of any implies that high performance becomes unfeasible (Bos-Nehles, Van Riemsdijk, & Kees Looise, 2013; Pringle & Blumberg, 1982; Siemsen, Roth, & Balasubramanian, 2008; Uyargil & Ozcelik, 2015). More specifically, in such cases it could be more likely that work-floor employees' participation in innovation processes will be poor. In the case of EDI emergence, it is expected that the full collective innovative performance through EDI will not or poorly be effectuated if one or more AMO policy-areas are absent in an organization.

We believe that these contextual factors together can help to structure innovation routes such that all work-floor employees can participate in innovative processes and improve innovation performance. We investigate innovation routes within EDI to further substantiate contextual factors and their effect on such innovation routes.

## 2.5. Theoretical framework

Based on the abovementioned insights from the literature, we have developed a theoretical lens that helps to empirically examine how work-floor employees contribute to employee-driven innovation routes (see Figure 1).

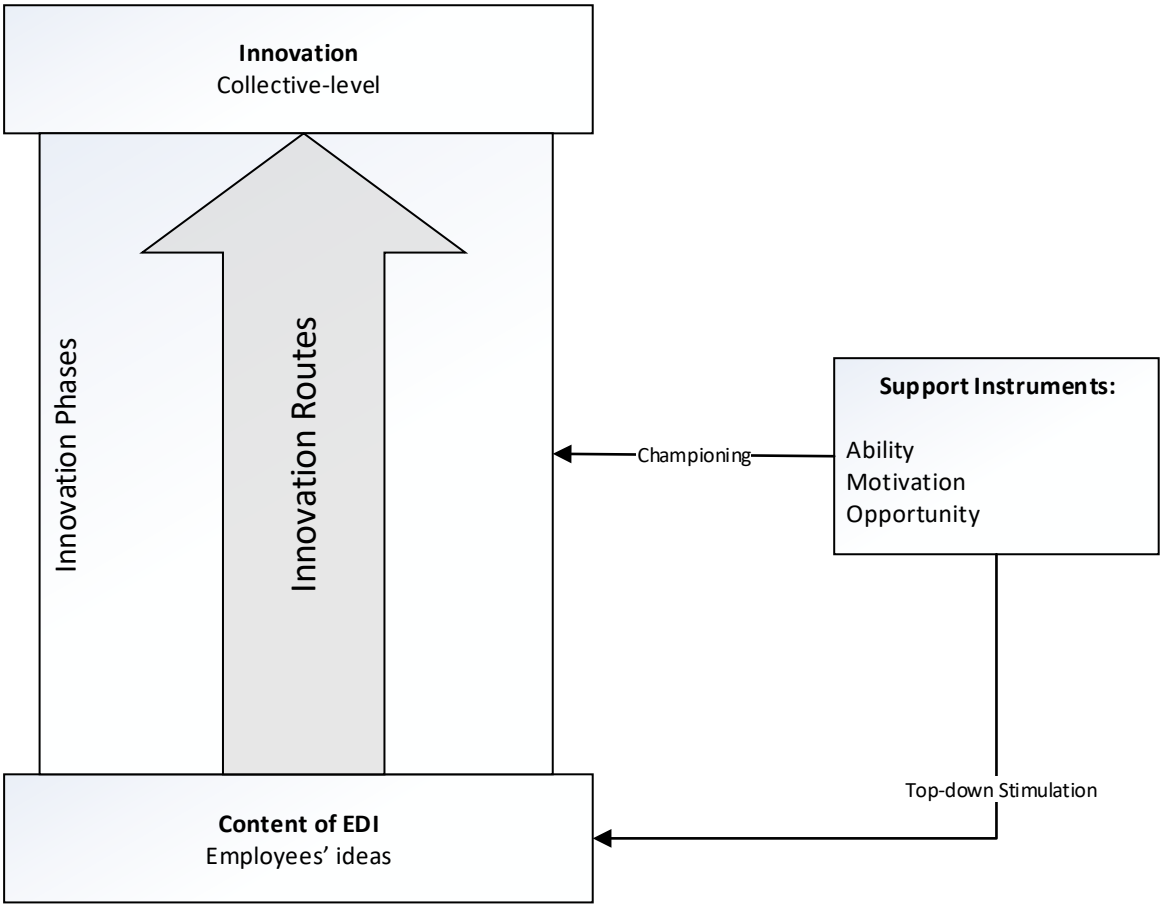


*Figure 1: Theoretical framework of EDI emergence through innovation routes inspired by Renkema et al. (2018)*

# 3. Methodology

## 3.1. Research approach

Because of the explorative nature of this study, the research methodology executed in this report is qualitative. The approach of qualitative research is to observe non-numerical data, is rather focused on 'why' and 'how' a certain phenomenon may occur (Alasuutari, 2010; Bogdan & Taylor, 1990). Qualitative research tries to understand the interpretation of reality at a particular point in time from a specific context (Creswell, 2007). Due to the execution of the research within one single organization, this research is considered a case-study (Yin, 2014). The case-study reviews in-depth characteristics of innovative behavior, active participation in innovation of employees and existing (employee-driven) innovation structures at The Residence in Enschede.

The goal of the case-study is to uncover how work-floor employees contribute to EDI routes, and how HRM instruments influence EDI routes towards collective-level innovative performance. As bottom-up innovation routes and EDI emergence has not been studied extensively, an in-depth explorative study of a single case is a justified approach for further knowledge development on these topics (Strauss & Corbin, 1990). It is further appropriate to use a case study design because it helps uncover and describe the dynamics behind EDI emergence and innovation routes from a process perspective. We use a process theorizing approach combining inductive and deductive strategies to take both the context and theory into account (Langley, 1999; Pettigrew, 1992; Yin, 2014). Process theory is making sense out of how and why events happen over time (Langley, 1999; Mintzberg, 1979).

The case study company is a Dutch Housing association, in this research referred to as 'The Residence'. The Residence is a particularly appropriate organization for this research as innovation is currently highly valuated within the organization. Technological pressures such as retrofitting, hydrogen energy sources, and information technology (IT) necessitate innovation to hold on to a steady return on investments of sustainable building projects initiated by The Residence. Furthermore, The Residence is a specifically interesting research object because it is highly focused on innovative behavior of employees. The idea behind this is to develop innovations with more radical nature of innovation to help reducing costs and creating sustainable value. To support these innovations, The Residence initiated a platform, specifically established for employees to help develop innovative ideas into innovations. Through investigation within this context, we expect to gain new knowledge on the phases of the innovation process which particularly have to do with the less researched topic of 'idea implementation'.

## 3.2. Data collection

The case study took place between the months July and September of 2019. We have gathered data using semi-structured interviews, observations, and document analysis. A total of 17 semi-structured interviews are held

across the hierarchical levels of the Real-Estate division as well as the Customer and Districts division of the organization. Since the research is about innovations driven by work-floor employees, the most important group of interviewees are the work-floor employees. In this group, both work-floor employees who have been or are active in innovative processes as well as work-floor employees who have not been involved in innovative processes are interviewed. Also work-floor supervisors, team leaders, human resources managers, and innovation managers are interviewed to ensure that the whole EDI emergence process is mapped.

### 3.2.1. Data sampling, sources and procedure

The first phase of the research functions as an orientation phase in which an open informal conversation with the innovation manager will be held to understand the organizational culture broadly and to gain information about the role of innovation at the organization of The Residence. This allowed to view some examples of employees' ideas that transformed in real innovations. As this research focus on the implementation of innovative initiatives of employees, these examples are included in the semi-structured interviews as well as the involved employees of these examples were selected in the sample. The data provided from this first phase is mostly informative to have background information on the organization and the role of innovation. In close collaboration with the innovation manager, participants for the semi-structured interviews were selected based on their involvement in innovative initiatives and based on their functions and level in the organizational hierarchy. The sampling procedure started with choosing two divisions that deal differently with innovations. Within the different divisions, we focused on selecting more work-floor employees who are involved with innovations than work-floor employees who are not involved with innovations and selecting evenly from the divisions. Among the work-floor employee selection, we also aimed for the inclusion of employees that represent different parts of the process. For example, we purposely included an IT and a financial employee in the sample selection. Next, we selected individuals that have a more supervisory role as well as team leaders to view the topics from different hierarchical perspective. In addition, we selected employees and managers from staff functions such as HR and innovation. Based on this selection, an invitation was sent to employees with the request to participate. Furthermore, two employees were selected as well based on snowball-sampling throughout the interviews with selected participants.

This in turn led us to the second phase, which consisted of conducting semi-structured interviews by asking work-floor employees about their involvement in innovative initiatives, and what these innovative employees drove to participate. Most importantly, the interview for innovative employees included questions about the process of the innovation in which employees can participate to identify characteristics of existing innovation routes. Furthermore, work-floor employees who are not necessarily involved in innovative initiatives were asked which factors play a role that they are not involved.

The third phase includes the investigation of the support mechanisms towards the innovation process by asking work-floor supervisors or seniors, team leaders, human resources managers, and innovation managers how

they are involved in bottom-up innovation processes, what their role in supporting these processes is, and how they support these processes. The full semi-structured interview protocol is shown in Appendix A.

The interviews lasted approximately 45-60 minutes and are conducted in a closed room at the office building of The Residence to eliminate the risk of being overheard. Before the interview started, the interviewees were informed about audiotaping of the interview and were guaranteed of anonymity and confidentiality. After the semi-structured interviews took place, the audio files were fully transcribed, and verified by the interviewees to enhance the credibility and validity of the results (Yin, 2014). In total, 17 interviews are taken at The Residence. The composition of participants is shown in table 2.

| **Informants** | **Gender** | **# interviews** | **Length** |
|---|---|---|---|
| ***Involved work-floor employees*** | | ***5*** | ***269 minutes*** |
| *Customer service agent1* | *Female* | | *60 minutes* |
| *Real-estate sustainability employee* | *Male* | | *57 minutes* |
| *Project lead of Real-estate projects* | *Male* | | *48 minutes* |
| *Financial controller* | *Male* | | *54 minutes* |
| *Internal data consultant* | *Male* | | *50 minutes* |
| ***Non-involved work-floor employees*** | | ***3*** | ***110 minutes*** |
| *Customer service agent2* | *Female* | | *27 minutes* |
| *Home-finder and desk agent* | *Female* | | *35 minutes* |
| *Real-estate developer* | *Male* | | *48 minutes* |
| ***Work-floor supervisors*** | | ***3*** | ***144 minutes*** |
| *Supervisor/senior project lead* | *Male* | | *42 minutes* |
| *Supervisor/senior RES* | *Male* | | *48 minutes* |
| *Supervisor/senior building manager* | *Male* | | *54 minutes* |
| ***Team-leaders*** | | ***2*** | ***87 minutes*** |
| *Team leader REP* | *Female* | | *44 minutes* |
| *Team leader M* | *Male* | | *43 minutes* |
| ***HR managers*** | | ***2*** | ***78 minutes*** |
| *Team Leader HRM* | *Female* | | *37 minutes* |
| *HR Advisor* | *Female* | | *41 minutes* |
| ***Innovation manager*** | | ***1*** | ***61 minutes*** |
| *Information/innovation manager & Team leader of Financial Control* | *Male* | | *61 minutes* |
| ***Innovation team members*** | | ***1*** | ***48 minutes*** |
| *Innovation team chair* | *Female* | | *48 minutes* |
| | | ***17*** | ***12.3 hours*** |

*Table 2: Overview of conducted interviews at The Residence*

## 3.3. Data analysis

After the verbatim transcription of the interviews, all raw data was inserted in data analysis software 'ATLAS.ti' which data subsequently was analyzed using a hybrid approach of inductive and deductive analysis (Dubois & Gadde, 2002; Fereday & Muir-Cochrane, 2006). We have analyzed the inductive part of the analysis by using the sequential series of coding strategies from Strauss & Corbin (1990). First, the raw data was read and re-read to classify thematic concepts accordingly the 'open coding' strategy. These codes are the first-order codes. As this research is explorative, open coding enables to find aspects in the transcripts that is not accounted for from

the researched theory of bottom-up innovation routes. We identified 399 first-order codes which are characterized by literal themes that interviewees point out. For example, the first-order code 'creating support' is mentioned to make clear that a support base on multiple hierarchical levels increase awareness and the chance of successful success. Also, 'creating support' is stipulated as an output of sharing innovative ideas. First-order codes are telling individual stories that link to a larger phenomenon. Second, we read the data again to identify such interconnections between first-order codes and categorize these codes as second-order codes with the 'axial coding' strategy. For example, first-order codes 'sharing successes', 'start the conversation around innovation', and 'creating urgency' explained partially how awareness on innovation topics was created within the organization. Such interconnections among others, defined the second-order codes. As a result, we grouped the first-order codes in 45 groups through which we identified second-order codes.

Next, we categorized third-order codes both inductively and deductively, meaning that the third-order codes derive from the theoretical framework as well as from second-order codes (see figure 2). To explain this, we use the theoretical framework for more clarity. The theoretical framework is composed of aggregated dimensions (e.g. support policies and innovation phases). As such, we deducted third-order codes as theoretical categories (e.g. in case of support policies: ability, motivation, and opportunity). However, some of these third-order codes are rather abductive where it can be identified from the data that there are more explanatory categories underlying the aggregated dimensions which are not accounted for in the theoretical framework (Dubois & Gadde, 2002). For example, we identified three innovation phases (e.g. idea generation, idea development, and idea implementation) for this research context, where our theoretical framework claims that there are five innovation phases. We identified the third-order codes inductively with the axial coding strategy which allowed us to find interconnections between second-order codes. We used abovementioned strategy to consider if our theoretical model can be complemented with additional understanding of the dynamics of bottom-up EDI emergence. Furthermore, we use the temporal bracketing sensemaking strategy of Giddens (1984) as it fits the nonlinear dynamic perspective on the innovation processes of The Residence well. We use this strategy to describe and visualize phases and their underlying activities. Temporal bracketing is a way of structuring that decompose data into consecutive adjacent periods to examine how actions in one period influence actions in subsequent periods (Langley & Truax, 1994). This allows us to analyze patterns as well as identifying factors that influence actions and behavior within a context that is characterized by multiple involved levels and actors, changing relationships, thoughts and feelings (Langley, 1999). We identify three phases through which innovation routes emerge dependent on factors of influence.

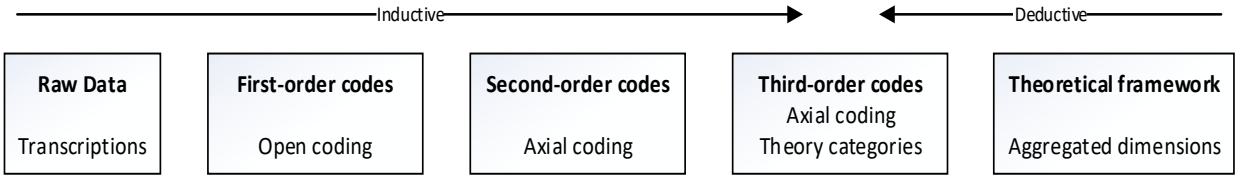


*Figure 2: Analysis coding strategy*

The results derive from the coding strategy. As such, we identified that EDI routes (aggregated dimension) consist of three EDI phases (third-order codes), and each phase is subdivided in activities (second-order codes). Also, we find that factors of influence (aggregated dimension) divides three categories of factors (third-order codes) which consist of factors (second-order codes). Nevertheless, we still had to adjust the initial codebook to fit the research question. For example, the second-order codes which derived from the first-order codes through axial coding identified factors of influence whereas our research question requires instruments that influence work-floor employees to contribute to EDI-routes. Therefore, we revised the factors of influence by examining the first-order codes in the transcripts to identify instruments that are applicable. Due to the focus of this research we present the codebook as shown in table 3 without the first-order codes.

| **Second-order code** Category | **Third-order code** Category | **Aggregated Dimensions** |
|---|---|---|
| *Raising innovation awareness among employees* | *Idea generation* | *EDI phases* |
| *Gaining and creation of ideas* | | |
| *Collecting, presenting and the onset of ideas* | | |
| *Group creation* | *Idea development* | |
| *Unauthenticated development of ideas* | | |
| *Establishing and officially finalizing ideas* | | |
| *Group creation* | *Idea implementation* | |
| *Implementation and evaluation of idea* | | |
| *Routinization and adopting the innovation* | | |
| *Utilize existing knowledge from employees* | *Ability enhancing instruments* | *Factors of influence* |
| *Developing knowledge and extending skills* | | |
| *Gaining skills and knowledge through recruitment* | | |
| *Long-term strategy radiation* | | |
| *Non-financial rewards* | *Motivation enhancing instruments* | |
| *Sharing successes and setting examples* | | |
| *Using electronic platforms for creating enthusiasm* | | |
| *Building a mutual feeling of trust* | | |
| *Providing a free to spend innovation budget* | *Opportunity enhancing instruments* | |
| *Facilitating employees' needs to innovate and serving* | | |
| *Creating a physical place for innovation purposes* | | |
| *Inducing a central function and policy for innovation* | | |
| *Changing job designs with sustainable employability* | | |
| *Installing multidisciplinary teams* | | |
| *Providing slack time for improvement and innovation* | | |

*Table 3: Codebook*

# 4. Findings

This section describes the results that derived from the analysis of the semi-structured interviews and documents collected during the case-study. The case-study highlights that employee-driven innovation routes are indeed existing in various dynamic forms. Moreover, we saw that support instruments influenced how employees acted throughout various phases towards innovations and that it influences collective level innovation success. First, we describe the case-study organization and the place of innovation within the organization. Second, the phases are delineated. Finally, we structure the support instruments corresponding the linkage between third- and fourth-order codes from the data-analysis as shown in the codebook in table 3.

## 4.1. Case-study organization and innovation context

### 4.1.1.Case-study organization – The Residence

The case study within this research is performed at a medium to large Dutch housing association in the eastern part of the Netherlands. The Residence owns over 18.000 rentable houses, commercial real-estate, and parking space for which the organization is held accountable of performing its core task: *'Sustainable living pleasure: living well and affordably in a pleasant neighborhood, for everyone who qualifies for social housing'* (Management, 2015). Housing associations are semi-public organizations and provide social housing where they are be held responsible to allocate housing to older people, people with a disability, manage the living environment, maintaining property and the immediate surroundings, and selling rented properties. The Residence carries out its activities with the effort of 200 FTE and results an annual turnover of about 100-120 million euro. The Residence has multiple hierarchical levels with on the highest level a managing director, with underneath a management team divided over four different divisions (i.e. 'Customer & Districts', 'Finance', 'Real Estate', and 'Policy & Organization'). Each division consists of various teams with a team-leader installed to cover the specific disciplines of operation. Communication between these teams is mainly horizontal meaning that communications between two work-floor employees from different teams happens directly without intermediaries.

The Residence is currently changing from a control culture towards an innovative culture. This organically changing culture is due to recent changes in the board of directors, letting go of a control strategy and tightened legislation for housing associations forcing innovation to meet new requirements from the government. Semi-public organizations such as housing associations are typically characterized by hierarchy, slow developments, and having difficulties with change and innovations (Borova, 2016). A high average age of employees and the high percentage of employees that are employed for ten years or longer is partly responsible to this phenomenon (Aedes, 2015; Christensen & Lægreid, 2006). However, the case-study organization tries to breach this apologue

with radical changes in how the organization handles innovation and with cultural change programs to shape every employee with the core values of 'Involvement', 'Professionalism', 'Responsibility', and 'Integrity'. Strategic documents address that the organization plans to focus more on sustainable employability of current employees while making room for automation and computerization. As a result, organizational change is now a less negative topic amongst employees, creating opportunities for employees to actively being part of the innovativeness of the organization.

### 4.1.2. Innovation at The Residence

To comply with the plans from the strategic documents, The Residence opened a vacancy for staff function to superintend the way how the organization handles their data and information. Quickly, it was noticed that innovation is inherently linked to this function. Subsequently, more attention shifted towards innovation. Two years ago, a team-manager dedicated a few hours in a week to fill this vacancy as information manager/ innovation manager. The role of the innovation manager is to strategically work out the role of innovation at The Residence. In line with the plans for innovation, an innovation team was founded as multidisciplinary staff team to work out information innovations. Recently, the innovation team has started to become a more general innovation function.

Innovations are currently originating from three groups: the innovation team, the real-estate sustainability team, and the tactical real-estate workgroup. An innovation emerges from these groups, dependent on the content of the innovation. An innovative idea concerning data and information is often allocated and redirected to the innovation team. Ideas towards maintenance and real-estate sustainability are directed towards the real-estate sustainability team or the innovation team. The broader strategic real estate and management innovations are handled by the tactical real estate and policy group. The tactical real estate workgroup is an entity that review real estate assets to determine if real estate should be sold, bought, demolished, our build. This group initiates innovations normally in a top-down manner and employees from other departments are involved based on their knowledge and the impact of the innovation on their tasks and job. Nevertheless, the innovation team is the only official group by whom innovations for the whole organization are handled. In contrast, the real-estate sustainability team and the tactical real-estate workgroup are in fact teams of the real-estate division that handle innovations that are required to achieve organizational goals concerning real estate assets.

From the interviews we identified 17 innovations which are radical in the context of The Residence (see table 3) and are found to be unique processes. The interviews show that these innovations emerge differently dependent on several factors. Such factors are the department and size, the scope of the project, the project topic, the size of the project and investment costs, and the personalities of the people involved. These factors play a role in how innovations emerge bottom-up. We observed that most innovations at The Residence emerge bottom-up, as explained by the HR manager:

> *"I think that we are the perfect example of employee-driven innovation as we have not explicitly set goals for innovation, but it emerges anyway since there is a need for innovation to keep existing" (Team leader HRM).*

In other words, innovations arise from the bottom-up while innovative behavior is not expected per se.

| # | Innovation | Content of innovation |
|---|---|---|
| ***1*** | *Circular construction* | *Building new houses with renewable materials and from used materials* |
| ***2*** | *Blockchain technology* | *Securing and automation of financial administrative processes* |
| ***3*** | *Robotization and automation* | *RPA software that employees can use to automize administrative tasks* |
| ***4*** | *High temperature heat pump* | *A state-of-the-art heat pump which can reach temperatures over °C 60* |
| ***5*** | *House checker software* | *Self-written XML-software to integrate different databases and use google* |
| ***6*** | *Housing allocation software* | *Saving time that administrative employees use to check applicant's status* |
| ***7*** | *Hydrogen boiler* | *A hydrogen electrolysis system to produce hydrogen for use in a boiler* |
| ***8*** | *Integrated contracting* | *Long-term collaboration contracts to use expertise of third parties better* |
| ***9*** | *Social return on investment model* | *A model such that there are handles to socially responsibility* |
| ***10*** | *Sustainability prototyping* | *Prototyping of houses to standardize sustainability measures* |
| ***11*** | *Sustainable employability* | *Opening up job descriptions and reorganizing what is best for employees* |
| ***12*** | *Tender renewal* | *Simplifying tenders and let the contractor define the details of projects* |
| ***13*** | *Tikkie* | *Using Tikkie to accelerate payment processes and collect late payments* |
| ***14*** | *Document upload tool for home seekers* | *An integrated collaborative software to simplify enrollment and signing up* |
| ***15*** | *Bathroom wall renovation* | *Installing a prefab wall with tiles instead of tiling the whole bathroom* |
| ***16*** | *Computerization* | *Shifting a focus towards data and less on documents* |
| ***17*** | *Energy transition* | *Becoming carbon neutral in 2050, and have all houses on label B by 2025* |

*Table 4: Overview of identified innovations at The Residence*

EDI manifests itself through the contributions of individual work-floor employees. Most interviewees indicate that there is plenty of room to suggest ideas regarding innovations or to get involved with ongoing innovation projects. We suggest that EDI routes start when a work-floor employee helps drive the innovative idea into an innovation. Work-floor employees drive innovations with their countless insights and ideas based on their knowledge, creativity and networks. When innovations are developed at The Residence, they are mostly part of a small group of people. Often, such an innovative idea has consequences to other disciplines in the organization. For example, that a technical workgroup uses high-tech solutions which are hard to comprehend to our target audience for whom social support is necessary, as mentioned by a work-floor supervisor of the real-estate projects team:

> *"It is hard to get involved in real-estate projects when you are not part of our team. The question is if they even are aware of the things that are going on. I have never experienced a moment that an employee of Customer & Districts wanted to contribute a specific insight. This is very logical as they are more concerned with the target audience and the 'figural' distance between our departments is very big. If I look to our goal of becoming energy neutral, it would be very helpful to have the insights and ideas of employees who are closer to our target audience. This is because we often tend to develop highly technical solutions which are way too complicated to our target group" (Senior Real-estate project lead).*

Abovementioned indicates that including other members of the organization is necessary to complement skills and information that are very useful for the further development and implementation of innovative ideas. Thus, we state that employees can contribute to innovation routes in the very beginning of the innovative idea generation as well as in later stages of the innovation routes.

Most interviewees indicate that they can contribute to innovation but explicitly state that they do not have expertise in certain topic areas and therefore they feel not suitable to contribute to some innovations. An IT work-

floor employee emphasizes that this feeling is unjustifiable and that contribution with day-to-day task related knowledge can be used in ongoing innovation projects as:

> *"Normally I would say to not ask me help developing heat pump systems for our real-estate. Heat pump systems are a topic with which we reach many trade magazines. To further develop heat pump systems, I have some insights to handle computerization, monitoring sensors and automation. I always discuss these kinds of ideas with the initiator of such an innovative hardware idea" (Internal data consultant).*

Subsequently, we see that if innovative ideas are not shared within the organization, there is no contribution of work-floor employees possible. Furthermore, we state that ideas that are generated, developed and implemented within a specific group without the contribution of the countless insights and ideas of work-floor employees are a missed chance of potentially reaching higher innovative success levels. This is identified from the interviews with supervisory employees and team-leaders who state that some innovative projects were failed under circumstances of criticism. This criticism is due to people being stuck in daily work routines. A senior of the real-estate sustainability team suggests that creativity helps to breach current thinking patterns which opens innovation possibilities as creativity of work-floor employees can offer solutions where criticism repulse innovations.

## 4.2. EDI phases

In this section, we show that innovation routes exist of different phases. These phases explain how employees at The Residence can contribute to collective level innovative success. Throughout the analysis, we identified 3 EDI phases, namely: idea generation, idea development, and idea implementation. The phases fit our theoretical framework and each of these phases are found to consist of different activities. Furthermore, we see that EDI routes do not follow a standardized sequence throughout such activities. Throughout this section we view examples on how EDIs have emerged throughout the different EDI phases and we analyze patterns. A total overview of an EDI route pattern is illustrated in Appendix B.

### 4.2.1. Idea generation

Idea generation is a phase where ideas are formed and created within cognitive processes or while interacting with other people and has a suggested idea as output of the process. The idea generation phase consists of three activities: awareness creation, idea creation, and idea onset.

*Awareness creation* – In the analysis on innovation routes that employees may wander, we find an interesting aspect before ideas are formed and created. A continuously active pre-phase that creates awareness on the topic of innovation is identified. As The Residence is increasingly interested in innovation, there is a need for stimulation that is top-down directed. Interviewees indicate that this stimulation is necessary for them to be more active with suggesting ideas and offering involvement during existing innovation projects:

*"I think that innovation should be promoted more, you never hear that management or team-leaders search for innovative suggestions. I will not suggest ideas if I do not know if that is expected or desirable behavior" (Non-involved customer service agent).*

One of the HR-advisors states that employees must not forget to include other employees since there are employees who are willingly to contribute to innovation, but do not have a clue how they can help and have little energy left for additional tasks. The first activity within the idea generation phase is to create awareness and support among work-floor employees on how they are needed to create innovative success. This first activity is initiated by the key innovative players within The Residence as they persuade team leaders to discuss innovative behavior with their employees. Subsequently, team leaders continuously speak with their employees about innovations and if the employees have ideas to suggest. This is particularly the case during team meetings. In the meantime, the key innovative players at The Residence share previous successes of innovations via electronic platforms to induce enthusiasm, create support and call for innovative input. As a result, work-floor employees address each other on eventual pessimistic behavior caused by a continuous exposure of positivity towards the innovation topic. A financial controller explains this pattern of awareness creation as:

*"To create support for innovation at The Residence, the first need was, and I think still is, to make people conscious about innovation. When every employee has a positive attitude towards innovation, it will be a lot easier to innovate. This is done by sharing innovative successes on SharePoint by people who are active with current innovations. Especially discussions during team meetings have effect as the team leader challenges employees to search for improvements. During a release of new software, I saw that employees tend to collaborate to get familiar with the new software where these kind of releases in the past caused a lot of criticism" (involved financial controller).*

We illustrate the first activity in figure 3. In some cases, interviewees stated that their team leader is oriented towards innovativeness. These team leaders are often part of the key innovative players of The Residence.

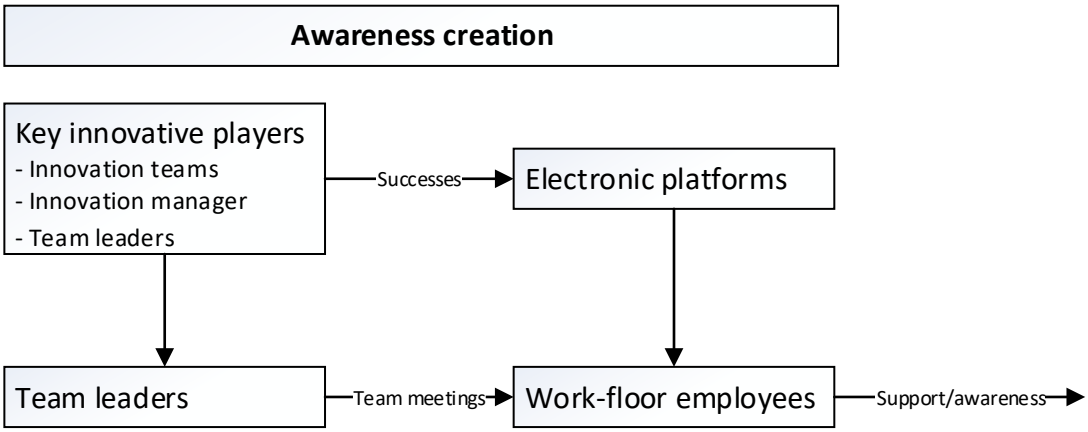


*Figure 3: Awareness creation and support*

*Idea creation* – The second activity is the creation of ideas. We see that this activity exists of a part in which information is gained by individual employees, and that a second part is the creation of the idea. From the interviews, we see that information gains are twofold. They are either unconsciously gained by the employee or indirectly pushed by the team leader. Team leaders play a strategic role during this activity. Team leaders trigger

different resources such as employees and network contacts to come up with ideas. Often, this means that external consultants are hired, third parties are approached, and employees are stimulated to look beyond their daily activities and going external to gain ideas:

> *"I always receive a lot of emails and invitations of symposia, lectures, meetings and congresses. You are stimulated and free to attend to such things. With a group of people, we go to the construction congress for fun. Unconsciously, we see new things on the market which gives us ideas to use with our organization. That stimulation and freedom is important. After that, you are responsible to move the organization to get things off the ground" (Involved real estate project lead)*

In this stage, employees' creativity is triggered as they hear about innovations and receive a lot of information. As the information is processed within the employees' mind, the idea creation part is activated. We suggest that this is a cognitive transformation process that turns information into ideas. Team leaders help shape this cognitive transformation by discussing problems that needs solving and asking employees to find alternatives for current ways of working as stated by the senior real-estate sustainability. We show this activity in figure 4.

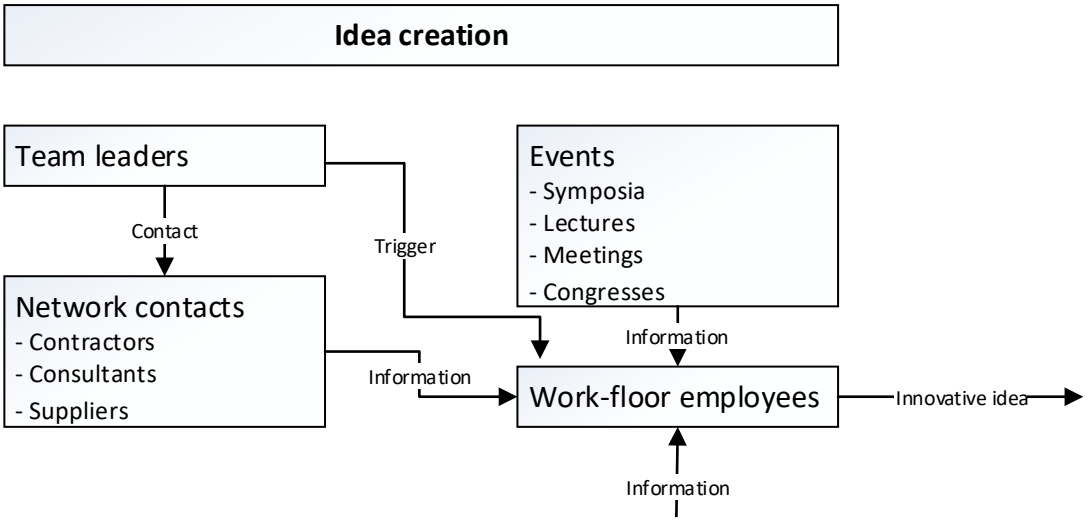


*Figure 4: Idea creation*

In some cases, we saw an altered pattern with work-floor employees that already show innovative behavior do not require a trigger from the team leader to transform information into innovative ideas. In this case, the team leaders no longer play a large role within the activity of idea creation.

*Idea onset* – After ideas are created, they may be suggested by the employees, collected from the employees or withheld by the employees. We identify idea onset as the third activity of the idea generation phase. The idea onset activity consists of two parts where ideas can emerge bottom-up or ideas could be collected from a top-down perspective. Both forms of idea onset include a form of presentation of the idea. An advantage of collecting ideas is that one can search for focused ideas to apply on specific problem-areas and functions as an idea filter. Idea collection is explained by the process agent of the leasing team as:

*"We have seen a lot of messages on SharePoint in which the improvement team demonstrated what they are busy with and what they have done so far. In these messages, the improvement team asks specifically for ideas from all employees" (Involved customer service agent).*

However, we have found that the collection of ideas occurs at different places. We see from the quote that it is the innovation team who collects ideas via SharePoint. A member of this innovation team addresses that there is an idea box for ideas that concern innovations and improvements. However, these ideas are selected based on their relationship with the topic of 'information'. A project leader of real estate projects argues that there is no such thing as an idea box, but that idea collection happens within the different teams and especially during coffee breaks in the pantry or during team meetings with the team leader. In one particular team, the real-estate sustainability team, we identified a hybrid solution that collects ideas and functions as central document for work-floor employees of that team to suggest ideas where both available innovations as well as current problems are written. We see different cases where employees have suggested innovations. Either they communicated these ideas first with direct colleagues or they go directly to their team leader. In all cases, ideas emerging from employees go by the team leader to discuss how the idea may be put into motion. We illustrate the pattern of the idea onset activity in figure 5.

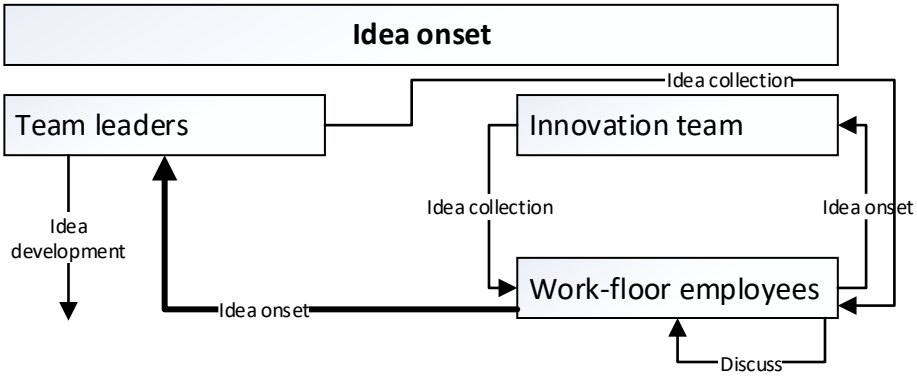


*Figure 5: Idea onset towards idea development*

### 4.2.2. Idea development

Idea development is the phase in which a suggested idea is developed and established by a group of employees with a well-defined implementation plan as result. The idea development phase is subdivided in three activities: group creation; unauthenticated idea development; and idea finalization, establishment, and proposal.

*Group creation* – When the idea emerged from work-floor employees, it is discussed with the team leader. Next, the team leader discusses with the work-floor employee how to put this idea further into motion. The most common pattern is that the team leader communicates the idea with other team leaders and asks for assistance

from other (specific) work-floor employees of other teams one by one. This activity is characterized by the creation of a group as explained by a senior building manager:

> *"After the idea was consulted with the team leader we sought for a broad selective working group. I have been part of that group. The team leader arranged this group to ensure that existing proceedings are continued. We cannot just decide who is going to be put in the working group. Every working group member was asked individually based on competences and of course with permission of their own team leader. The working group existed of two construction supervisors, someone from customer and districts, a social worker, a financial controller to monitor the process and an external advisor. These working groups are often set up multidisciplinary to create a large support base" (Senior building manager).*

In some cases, we saw that employees who show a higher level of innovative behavior are authorized by the team-leader to form their own group. In this case, work-floor employees ask other work-floor employees from other teams to join a workgroup to develop an innovative idea. Subsequently, the work-floor employees consult their team leaders on their request to join this group and asks for permission as this may have consequences for existing tasks. We found also that it is dependent on the content of innovation and how a working group is put together. For example, a project leader of real estate projects points out that construction innovations are handled with a few internal work-floor employees, team leaders and managers, but is more focused on co-creation with third parties formed by a consortium. Furthermore, we find that in some cases work-floor employees are deliberately excluded for participating in a working group as well as employees indicate that it is not that easy to get involved during the development of ideas. The main reason that some work-floor employees are not involved till the end, is because the employee is not part of the usual suspects that are always connected to innovation projects. The first activity of idea development is thus group creation which is illustrated in figure 6.

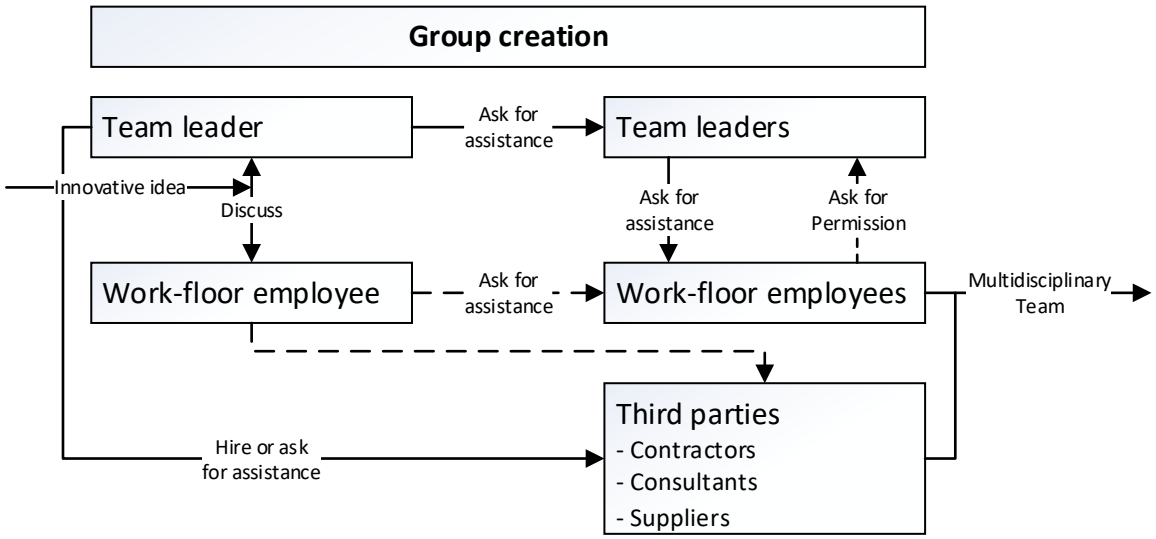


*Figure 6: Group creation*

*Unauthenticated idea development* – The second activity during idea development is developing the idea discretely and creating a support base by sharing the idea within the organization. We found that as, what employees call, a bureaucratic structure exists within The Residence, working groups are advised by the team leaders and idea

supervisors to create support among other teams and divisions before the innovative project is authenticated via official structures. It is emphasized by team leaders that a large support base is necessary before officially proposing innovative ideas to the decision makers in the management team. Ideas are thus first developed in a working group under the radar of the management team. To create a large support base, an idea is revised by the working group for which they combine other ideas, filter ideas, search for alternatives, and look beyond the daily activities. After the working group have finished a draft of the innovation, it is shared with direct colleagues of working group members and thereafter with whom the innovation might affect their daily activities. The innovation team chair explains the above mentioned as:

> *"After we included some people in our team, we researched and captured how we can successfully implement the innovation. Of course, this is just a scratch for what we are about to develop. After this, we talked a lot, with individual managers, team leaders and work-floor employees just to convince them of this idea. But initially, we do not do anything via the official channel yet. We handle everything such that no one can say anything about it until everyone is informed and convinced that it is a good idea. Only then, we submit a request by the official route" (Innovation team chair).*

Communications during this activity are mostly done by face-to-face contact since this may give more of a feeling with the innovative idea as indicated by interviewees. Some interviewees mentioned that waiting for the right timing and having the right people on the right places is necessary to increase the chance of successful innovation and receiving official permission from the management team. The HR manager argues that this is needed to get everyone on board with the idea. We stipulate this idea development activity as 'unauthenticated idea development' and illustrate the general pattern in figure 7.

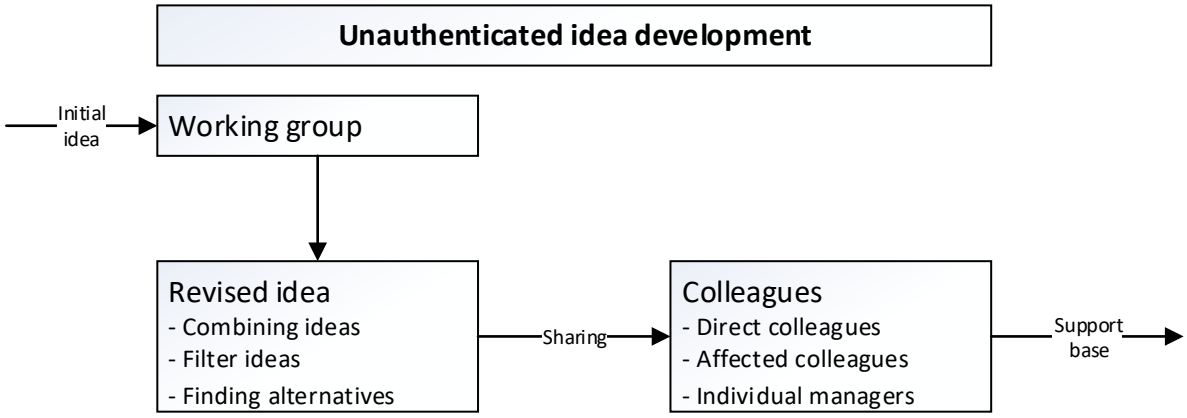


*Figure 7: Unauthenticated idea development*

*Idea finalization, establishment and proposal* – The third activity during the idea development is the official development and proposal stage of the innovative idea. In other words, the idea is extensively thought through, analyzed, finalized, established and documented towards a management proposal. The management proposal is the first official step in the innovation process. Nevertheless, everything hinges on this management proposal as the management team allocates financial and capacity resources to innovative projects. The formal route for innovative ideas is subdivided in four steps at The Residence as indicated by the team leader of real estate projects.

These steps are denoted with a Startnote, a request for research budget in the case of a very large project, DO-1, a request for budget on pilot projects and feasibility studies; DO-2, a request for budget to purchase and routinize a pilot project; and DO-3, an evaluation on the implemented innovation and create a financial balance sheet. Before the DO-1 proposal is submitted and presented to the management team, an extensive analysis is done first by the working group to create a management proposal document. This document contains preliminary research, a feasibility research, financial consequences, alternative solutions, key figures, a cost-benefit analysis, scenario calculations, and a risk analysis. This document may be revised several times as individual managers and experienced innovators within The Residence are asked to give feedback. The order of the formal route is repeatedly mentioned by the interviewees. Second, the management proposal is submitted by mail towards the management team. In some very exceptional cases, the management team give feedback on the content of the proposal document which then can be revised. Third, a member of the working group is asked to present an implementation plan and explain the proposal document in a meeting with the management team. Often, the work-floor employee who initially submitted the idea is asked to do this as this individual can transfer the innovative idea with the most enthusiasm and background knowledge. In the end, either budget for a pilot project is granted or rejected. We show the activity of idea finalization, establishment and proposal in figure 8.

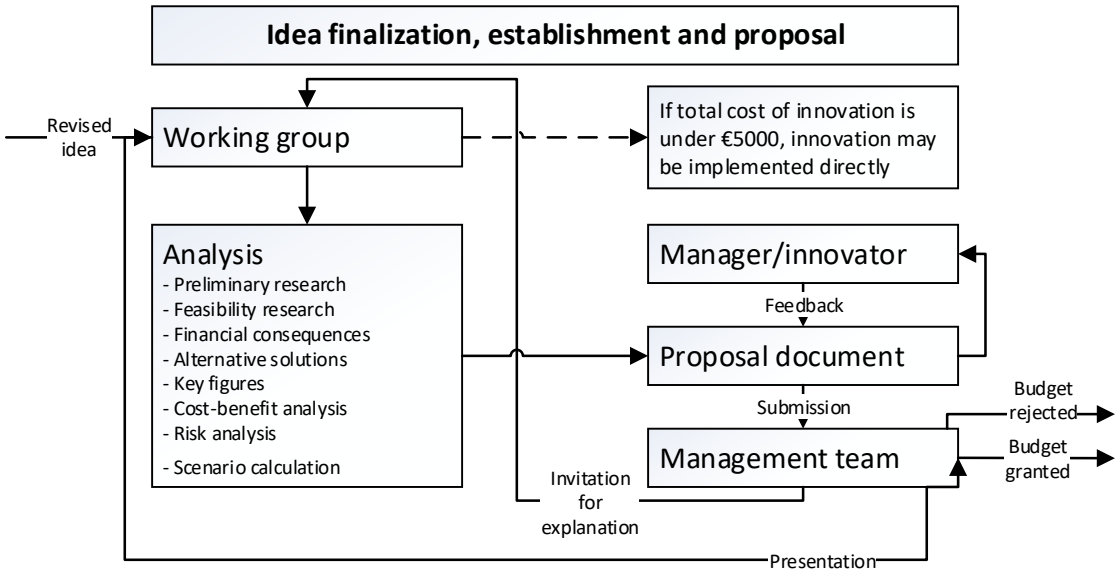


*Figure 8: Idea finalization, establishment and proposal*

### 4.2.3. Idea implementation

The idea implementation phase is the final phase of innovation routes. If permission and eventual resources are granted by the management team, the innovative idea will be implemented. As such, at the end of

the idea implementation phase we speak of an innovation. The idea implementation phase is characterized by three activities: group creation, the pilot project, and routinization.

*Group creation* – The existing working group who have established the innovative idea may subsequently be complemented, changed or entire replaced with new individuals, as we found from the interviews. The first activity within the idea implementation phase is thus once again the creation of a working group. However, according to the innovation manager there are normally few changes in an innovation working group, meaning that the group often remains the same as during the idea development phase.

*Pilot project* – The second activity of the idea implementation phase is a continuous process which alternates the execution of the implementation plan with evaluation and feedback during a pilot project. In principal, all radical innovations are tested throughout a pilot project. Smaller incremental innovations such as minor software updates or sending emails instead of physical letters are not tested with such a pilot project. A pilot project is implementing the full innovation in small to test if the innovation reaches the intended results. For example, the team leader of maintenance explained that the idea of the hydrogen boiler is implemented for a large building complex to monitor if the theoretical numbers matches the practical results. To date, this innovation is still in the pilot project phase to improve this innovation such that it could be used for all real estate. The senior of real estate sustainability explains how pilot projects work at The Residence as:

> *"Well, just do it sometimes. (…) We use preliminary research and the analysis towards the management proposal, then you need to execute it according to the plan. Often, we use a pilot project for innovations. But then all kinds of question arise (…) What I see is that we have lots of ideas, it is developed, but may be never implemented. With implementation, I do not mean that this is a quick meeting with a presentation on we are doing this. No, implementation is to just begin with the plan you had and evaluate in a few weeks how it went. Thereafter, we again evaluate to see if we must adjust or optimize anything in the plan. When you do not test it in such a pilot project, you never know how this initial idea will work-out and if the risks are too high to implement new ideas into the organization as a whole" (Senior RES).*

Depending on the content of the innovation, the intensity of a pilot project is different. For example, real estate construction innovations are more time and cost intensive then adding an existing application to make it easier to collect overdue rent. Furthermore, the team leader of maintenance indicated that sometimes they can shift in budgets such that financial resources are available for pilot projects without any necessary permission of the management team. Comparable is the approach of the innovation manager, who is also the team leader of financial control. As a result, the innovation manager knows where budgets are available, how much resources are left in each budget and allocates these in consultation with the management team to realize pilot projects. We illustrate the pilot project activity in figure 9.

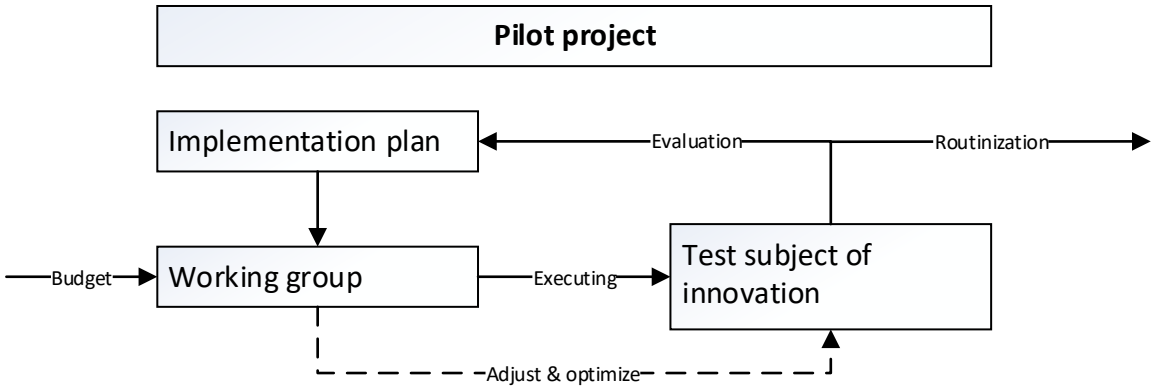


*Figure 9: Pilot project*

*Idea routinization* – Finally, the last activity of the idea implementation phase and as well of innovation routes is the routinization of the innovation in the organization. Routinization means becoming a routine (Collins English Dictionary, 2019). Routinizing innovations is reconstructing action patterns such that innovations become part of the existing routines and regular processes (Bos-nehles et al., 2016; De Jong & Den Hartog, 2010; Høyrup, 2010, 2012; Kleysen & Street, 2001). According to the innovation manager, a common lead time for innovations are 1,5 year. This is the time that is required to integrate innovations in a current work routine at The Residence. In the end of this period, every work-floor employee is familiar with the innovation and errors are identified and fixed as far as possible. Nevertheless, the working group may have encountered several difficulties during the implementation of the pilot project. These are important results from the pilot project that can be used when the innovation is routinized. For most innovations at The Residence, a request for budget to purchase and routinize a pilot project and a documented evaluation on the implemented innovation is required to implement the innovation within the organization as stated by the team leader of real estate projects. In other words, the management team requires working groups to evaluate and document results of the pilot projects before a decision is made on purchases and contracts regarding the innovation. If the pilot project showed improvements and future-proof results, the innovation is considered as a success at The Residence. Subsequently, the process for routinization activity is the same as for pilot projects but is scaled up. Interviewees indicate that this activity is lacking as indicated by a real estate project leader:

> *"I think that we are always trying to walk in front with each other in the area of innovation. But it mostly stays an idea. Sometimes, we are too quick and do not give the innovation the time which is needed. As a result, we do not evaluate that thoroughly since we frequently start with new projects and ideas of innovations. I see that if an innovation is proved that we tend to discover even newer technologies to test out. Thus, a lot of innovations that are tested and proved are never routinized in the organization. I think, that it has something to do with an existing fear of innovations at a certain group at The Residence" (Real estate project lead).*

Nevertheless, the routinization activity of an innovation is considered a continuous improvement process by many interviewees. The tasks of the initial working group who was in charge for the development and pilot project are now passed through to the work-floor employees who are affected by and have to work with the innovation. This

indicates that a significant part of the routinization activity consists of courses and learning for employees. We show routinization in figure 10.

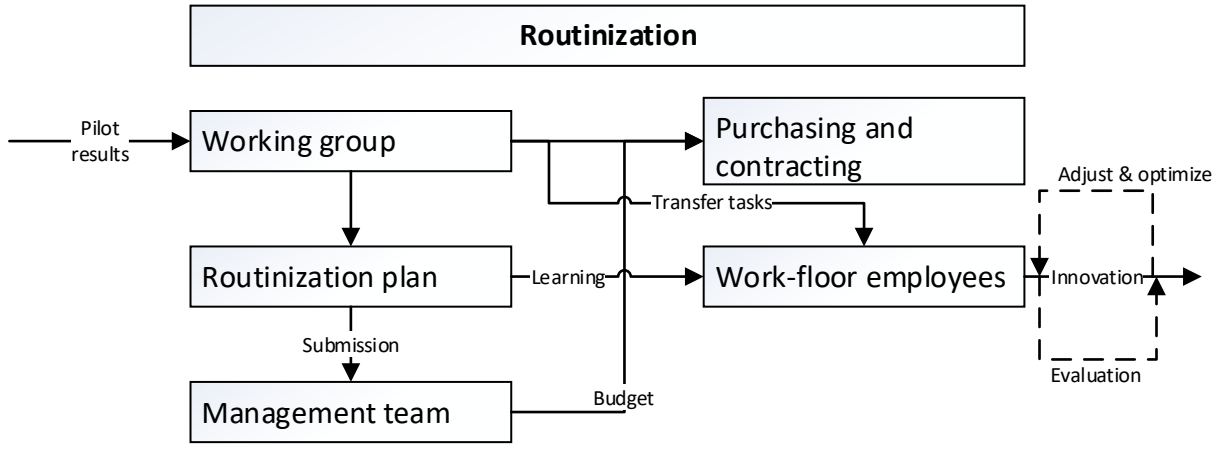


*Figure 10: Routinization*

## 4.3. Factors of influence and AMO framework

From the data analysis, we identified 399 factors that have influence on how EDI routes lead to innovative success. These factors are clustered into 15 instruments that have effects on the abilities and the motivation of the work-floor employee group to successfully innovate, as well as on the opportunities that work-floor employees could take to contribute to the collective level innovation. Most instruments have specific connections with certain phases which we will emphasize.

### 4.3.1. Ability enhancing instruments

*Knowledge utilization* - Work-floor employees at The Residence contribute with task-specific knowledge as well as knowledge from non-work-related interests and hobbies. Most interviewees indicate that there is a lot of knowledge in the organization and that employees are concerned with the organization. As a result, knowledge is utilized and available for the whole organization increasing the overall ability level of the workforce as expressed by a senior building manager:

> *"I think that it is the involvement of the organization that shows innovative power. From recent research initiated by management is concluded that there is a great scale of in-depth knowledge among work-floor employees. Where knowledge is, there is the key to success of innovations. You have to utilize knowledge as much as possible and empower people as much as they can to keep on looking for more efficient solutions" (Senior building manager).*

A small fraction of interviews from the non-involved work-floor employees state the opposite and that it is a big waste that the knowledge within the specific team of customer service is not used for innovation purposes. It thus indicates that knowledge is an important instrument that work-floor employees could offer if the organization subtracts this knowledge. Furthermore, former employers and colleagues, family, friends and acquaintances are a

source in which hide possibilities to innovate and even more knowledge. Utilizing the knowledge and networks of all employees creates an immense ability boost within the workforce to test and pioneer certain innovative areas.

*Knowledge development* – Almost all interviewees stated that The Residence have widespread possibilities to develop competences, knowledge and skills through education, courses, and training. Either a work-floor employee can consult the team leader that they want to sign-up for education, courses or training as well as The Residence initiate mandatory team-courses and training programs. Also, it is stimulated that work-floor employees develop their knowledge and skills as explained by a real estate developer:

> *"We already had personal development and performance meetings with our supervisor related to our job activities. Employees were asked what they wanted in the future, what they find interesting and where they would like to develop themselves in. People who liked innovation and improving processes and who were enthusiastic were motivated to follow courses on innovation. Further, in every department there are development programs as well. Once a year, we choose another topic, something that we think we need to do our jobs better. The team spend a whole day on that specific topic. There is plenty of freedom and budget for this" (Real estate developer).*

Furthermore, as indicated in a quote from a real-estate project leader, work-floor employees are encouraged and stimulated to visit symposia, external meetings, congresses, and lectures. Work-floor employees are constantly exposed to new knowledge and may gain new skills as well during these events. The Residence uses stimulation and possibilities for education, courses, training, and events to gain an overall abilities level of the workforce. The HR advisor explains how The Residence enhances abilities of work-floor employees:

> *"Since a year, we see a significant shift in the number of tasks that employees take over from other functions. We need education, courses and training for that. The intensity of developing competences will increase in the near future since more and more employees are motivated to develop their skills. Particularly peculiar is that people who never wanted to develop themselves are now interested in signing up for courses and training. At The Residence, employees can always look behind the scenes of other organizations. Further, we work on three phases. First, there is general professional knowledge which is for every team member the same, such as asbestos training. Second, teams enroll as a whole in team development courses and training. Third, we distinguish individual competence development" (HR advisor).*

Thus, development of the overall abilities at The Residence is enhanced through the instrument of education, courses, training, and events on a team level as well as on an individual level. We see that the development of such abilities influences the innovative performance of The Residence positively throughout all phases of an EDI route.

*Recruiting for the future* – From the interviews it became clear that recruitment is an instrument to increase the overall abilities of an organization. We found that several employees mentioned an example that indicated that recruiting employees gained innovative success. The innovation manager emphasized that this is due to factors that new employees could bring to the organization such as competences and knowledge as well as a new and fresh view on the current course of events. A work-floor employee of the real estate sustainability team agrees:

> *"One of the reasons that we have founded a central organization regarding real-estate sustainability with new people from elsewhere is to have a fresh perspective at the matter. So, having a fresh wind and that we just look at the current processes and ask ourselves: 'does it even make sense that we do things this way?' and 'can we do it better?'" (Real estate sustainability employee).*

Furthermore, we see that innovative ideas particularly come from a younger group of employees. The team leader of maintenance argues the innovative behavior impulse that younger age employees bring as:

> *"Since we have recruited new people, we saw that more innovations emerged. Other team-leaders are increasingly convinced of the method to select and recruit younger employees with other competences. Thus, with the inflow of new employees, one has to specifically focus on future-proof work capital" (Team leader M).*

The argument that employee age influences innovative capability of individual employees is too generalized. We saw that not purely age, but also self-reliance and a proactive attitude are competences that played a role during recruitment. Employees of an older age at the case-study organization mostly worked at the organization for 10-35 years and are tired of change or have given up their hopes for change due to negative events from the past. Most interviewees address that when one has an idea, proactivity is expected as most team-leaders do not take employees by the hand when they suggest innovative ideas. The instrument of recruiting is especially applicable on the idea generation phase as new employees see current events from another perspective then existing employees. We see from the interviews that new employees have a lot of new ideas that they share within this idea generation phase.

*Long-term strategy radiation* – When work-floor employees have more sight on where the organization intends to go and what others within the organization are doing, it becomes more clear what work-floor employees can contribute and how they can do it. The senior of real estate sustainability explains this as follows:

> *"I think that there is a lack on long-term vision with some team leaders. This originates from the management level where there are no clear goals. Let us look at it in the organization's perspective. So, we have a certain vision on the management level where is asked: 'Where do we stand as housing association?' and 'which tasks do we have?'. After that, every division has also a vision (…). That does tell where we stand, where we are going as organization and as a team. If that is clear, the next step is that work-floor employees have the room to reflect on how we can reach that and what we actually need. If there is no vision, then you cannot expect people to contribute to innovation. If there is a vision, but the vision is not shared or is not visible, well… that does not work either. There is much need from employees to discuss on why we make certain choices as organization. This certainly contribute to the fact that work-floor employees suggest more ideas since they know where we have to go" (Senior RES).*

In other words, by having a clear long-term vision of the organization and the division, work-floor employees can contribute with innovative ideas to help realize this vision. However, we found that certain employees benefit from the lack of vision as they experience much leeway to develop their ideas and bringing them forward:

> *"Our vision is sustainable living pleasure, without any aim for goals or innovativeness. So, you tell me, what should we do now? Personally, I find much advantage as you can easily work any interesting innovation and development into a frame such that it fit the vision of sustainable living pleasure. But, for many employees this is just unclear, (to management) 'just express what you want'" (Senior RES).*

On the other hand, even a larger group of employees sees this lack of a vision, especially towards innovation, as an indicator that innovations are not expected from them. We see that the group of employees who experience freedom to be involved in innovation processes, has in general the loudest voice within the organization and have better relationships with their supervisors and higher-level managers. Furthermore, by having more information

about current events, activities and what is going on at different teams, employees may have more relevant ideas to suggest. Most interviewees indicate that a high level of compartmentalization exists between teams. As a result, the wheel is reinvented several times within The Residence. Also, employees may not always oversee the consequences of their well-meant actions. A real estate developer stressed that sometimes colleagues do not know what they are doing in their team and that they thus do not come to them with things that may concern them. Radiating the long-term strategy and vision and connecting individual work-floor employees with activities of other teams is indicated by interviewees to have a positive impact on the abilities and thus the quality of the suggested ideas during the idea generation phase.

### 4.3.2. Motivation enhancing instruments

*Non-financial rewards* – Work-floor employees at The Residence are mostly intrinsically motivated to contribute to innovation as there is no defined reward system. Innovation is not expected to come from work-floor employees. Yet, innovations do emerge from work-floor employees. We found that there are non-financial rewards that are awarded to show gratitude towards work-floor employees. Although these rewards are not intended to motivate employees directly, motivation is an indirect positive side effect. Work-floor employees gain a feeling of being appreciated by the organization and are more comfortable within the organization through non-financial rewards. As a result, employees reciprocate by putting this positive energy back into the organization. This is explained by the innovation manager as:

> *"We see that enthusiasm on innovations spread like an oil slick. So, what is most important is that people are appreciated for their effort. You will notice that it has impact when you appreciate employees. From the 200 employees, there are 40 people always ready to accelerate innovations. These people do not do this because they may make more money. (…) What I see is for example, employees that build robots regarding an innovation get flowers and the project Tikkie is rewarded with a treat after 15 Tikkies for overdue rent. Once other work-floor employees start seeing this and if six people have gotten flowers, the seventh one wants that too" (Innovation manager).*

However, most employees state that receiving honest credits for contributions is the most important way of motivation. Non-financial rewards that are mentioned throughout the interviews are: taking credit, appreciation, education, flowers, more autonomy, treats, beverages and going out to dinner with colleagues. Furthermore, employees at The Residence are sometimes compensated with financial rewards such as allowance for hourly effort and a gift card with a small amount of money. In highly exceptional cases, employees receive bonusses for their contributions. Although some interviewees have indicated that they would not mind financial rewards, most of them explicitly stated that it would not influence the way how they contribute to innovation. We recognize non-financial rewards as an instrument that have influence on the involvement of work-floor employees during all phases of innovation routes.

*Sharing successes and setting examples* – The interviews show that sharing examples of successful contributes to the motivation and stimulation of work-floor employees to be involved with innovations. There are two reasons for

this. First, conversations on innovation are started through sharing success. Some employees at The Residence fear innovations to some extent as they fear for losing their job. Indeed, certain parts of existing jobs may be automized or cut back. However, the team leader of maintenance states that especially by showing results of innovations, a conversation is started about the opportunities that these automized tasks give for their job instead of looking at the losses. The interviews indicate that since more innovations are shared within the organization, employees who were skeptical towards innovation have come around and even have joined innovative projects. Second, setting examples and sharing successes serves as a promotion instrument to make more work-floor employees enthusiastic on innovation. Work-floor employees support employee-driven innovations more as it originates from the same hierarchical level as they work at. Also, employees that drive innovations are usually very passionate about their suggestions, which causes other employees to be more easily convinced to work along. The innovation team chair argues that sharing successes and setting examples is a good instrument to motivate people to get involved with innovations.

> *"I think that there is more potency of innovation at The Residence and that there is still a group that can be involved more. We influence this group by talking, giving examples, and implementing a small innovation successfully with these employees such that they can have a taste of success. My main task is also to ensure that people are feeling connected with innovation and to create support. If I am enthusiastic about something, I can transfer that. With these enthusiasm and examples of other innovations, I convince colleagues to come forward with ideas as well" (Innovation team chair).*

*Electronic platforms* – In order to motivate work-floor employees to be involved in the organization's innovativeness, The Residence uses electronic platforms as a channel to communicate activities around innovations. Most work-floor employees indicated that they have seen messages on SharePoint about recent innovative ideas or successful innovations. These messages are often a tribute to involved employees with a picture of them holding flowers. However, it is recognized by some employees that there is no clear call for them to suggest new ideas or to be involved in ongoing innovation projects. A call-center agent emphasizes this as:

> *"I guess that the opportunities to suggest ideas are possible with the innovation team. In the past, we saw many messages on SharePoint on what they did and if you have ideas, that you can message the innovation team. In my experience, it is a long time ago that such a message was published on SharePoint. But you need to keep reminding employees of ongoing and implemented innovations as well as asking employees to suggest ideas if you have any ideas" (involved call-center agent).*

There are other electronic platforms at The Residence as well such as Email, Dashboards, Shared documents, LinkedIn and even Facebook. Electronic platforms are commonly used at The Residence to create awareness on innovation practices and keep work-floor employees updated as this is meant to increase employee involvement. However, in some cases we see that work-floor employees are aware of these messages on electronic platforms and read them as well. Yet, these employees do not feel the urge for suggesting ideas or signing up for ongoing innovation projects. Some of these employees that have ideas indicate that they are more comfortable with communicating these ideas with the team leader. We find that especially awareness on innovation is created and

that it motivates and stimulates work-floor employees to think of possibilities regarding innovation that can help them improve the organization. Electronic platforms are particularly instruments that help generate ideas.

*Trust* – Many interviewees indicate that they feel trust as a motivational factor to suggest ideas and to drive innovations. However, trust is a complicated and broad concept. In some cases, interviewees indicate that they feel sufficiently being trusted as a person such that they are motivated to reciprocate discretionary effort. Other interviewees state that there is a lack of trust from the majority in the organization on less tangible innovative ideas and that it becomes a barrier to innovate. Since less tangible innovative ideas are harder to express in quantitative data, especially management team members and team leaders fear the risk of paying a high price for nothing in the end. Also, work-floor employees may distrust some innovative ideas as they threaten to take over their job activities. We underline these findings with quotes from interviewees.

> *"I have seen that it motivates work-floor employees to work on innovative ideas when I give them my trust. What is most important is that they feel free to discover and that they are not judged by anything. This is growing trust. I recently had a conversation with the managing director where I stated that I have never summoned anyone for something he or she had done. If you do this, an employee might never put extra effort in innovations and improvements again. If there is no trust, you walk on eggshells around each other. Real communication and sharing of ideas will decrease as a result" (Team leader M).*

In abovementioned example we see that trust is represented by giving employees freedom to do things and not judge them for what they do. The team leader of the maintenance team elaborated on this with an explanation that trust requires growth and that growth can be reached through collaboration, conversations, openness, transparency and convincing each other of the best intentions. Another interviewee indicated that it is important that employees are trusted on their expertise and that managers and other employees need to set loose from their opinions as this slows down innovations. This is explained by a real estate sustainability employee as:

> *"The project Robotizing is a good example of trust. So, that own employees are offered a training to analyze processes and build robots to perform repeating tasks. My team leader gave me room and trust to do this. If I have an idea, I usually think it through very well and develop a plan of action. The first thing that my team leader says when reading the first paragraph is: 'you have thought this through, I trust you'. Well, that stimulates and motivates enormously to take things regarding innovation to a next level" (Real estate sustainability employee).*

Thus, when work-floor employees, their abilities as well as the innovative ideas are trusted by the organization, innovative success will increase. This instrument especially supports the idea development and idea implementation phases of EDI routes.

### 4.3.3. Opportunity enhancing instruments

*Free innovation budget* – The Residence offers a free innovation budget to teams to fund small improvements, innovations, or research projects that lead to bigger innovation projects. This instrument lowers the barrier for employees to suggest ideas. There is room for experimenting with innovative ideas before heavy analysis is required for a management proposal. Management must approve innovative ideas before given budget for further developing and implementing ideas. Proposing such an idea for management decision making is a very time-

consuming activity that preferably is avoided by work-floor employees. Therefore, employees can make use of 5000 euro to start small with a pilot project as explained by the internal data consultant as:

> *"First, you discuss your ideas with your team leader. Every team has budget for researching such ideas. I believe we are free to spend 5000 euro per project without informing management. So, if I have ideas, I go to my team leader and ask if this is interesting to research. If my team leader is convinced as well, we can freely spend till 5000 euro on a pilot project. Otherwise, you need to ask budget from management. I think that many ideas are rejected here" (Internal data consultant).*

Of course, not all pilot projects can be funded as there are simply not enough resources to cover this. Therefore, the team leader function as a central collecting point and filter for ideas. In collaboration with the team leader, a work-floor employee gets verbal consent to work-out a pilot project or research either individually or with a group. Work-floor employees are found to be convinced of their innovative ideas. However, the management team at The Residence is less easily convinced of innovative ideas unless it is proved with an excessive analysis on the innovative ideas. Work-floor employees at The Residence are not motivated to work on such analysis and prefer to just test the ideas as they are convinced on its effectiveness. With a free innovation budget, both management and work-floor employees get what they wish. This instrument accelerates innovations in the development phase and gives work-floor employees the opportunity to prove their belief of innovative ideas.

*Facilitating and servant leadership* – Work-floor employees require leadership that can provide them with anything they need to put an innovative idea further in motion within the organization. We identified that facilitating leadership is used at The Residence as an instrument to use work-floor employees' abilities for successful innovations. Work-floor employees may have excellent innovative ideas and may be very passionate about these ideas to create support with direct colleagues. Yet, employees do not possess all the resources to put an idea further in motion. Team leaders and managers often do have access to those resources as they are in direct contact with other teams and divisions. This facilitating leadership is used by the innovation manager as explained:

> *"Because I have only 18 hours to execute my task as innovation manager, I encourage employees to develop these ideas by themselves. In fact, it is better that employees develop and implement innovative ideas themselves. An employee sees the advantages that maybe others cannot see yet. The employee is more capable of convincing direct colleagues on the innovation than I am. I can clear the road for these employees and ensure that the idea is supported in the organization as well as how we can provide resources for employees. Also, I make appointments with work-floor employees to check is everything is going according to plan. If it is not going well, I can provide solutions or facilitate help such that the employee can proceed. I know about the suggested innovative ideas broadly where employees know more in technical detail on the content. This is how innovative success comes about" (Innovation manager).*

Some interviewees mention that it is important that the employee who came up with the innovative idea, should be given ownership of the idea. In some examples of innovations, the employee stayed the owner of the idea till the innovation was successfully implemented. Furthermore, we found that servant leadership benefits innovative success. Servant leadership is defined as: *"a holistic approach to leadership that encompasses the rational, relational, emotional, moral, and spiritual dimensions of leader–follower relationships such that followers enhance and grow their capabilities, as well as develop a greater sense of their own worth as a result"* (Yoshida, Sendjaya, Hirst, & Cooper, 2014). In other words, servant leaders use their power for a means to serve others by placing the

well-being for the greater good of the team and organization over self-interest (Kark & Carmeli, 2009; van Dierendonck, 2011). We revealed that servant leadership is expressed by creating a safe space for employees to discover themselves. Interviewees with a supervisory role all argue for servant leadership and carry this out by being aware that they are there for all work-floor employees and by taking a coaching role. Work-floor employees indicated that they experience coaching as mental support as well as it opens the possibilities for them to be involved in innovation activities. The instrument of facilitating and servant leadership is used through building on relationships between the employee and team leaders. Facilitating and servant leadership influences all innovation route phases towards higher innovative performance.

*Physical place for innovation meetings* – We found that a physical reserved place that is specifically set-up for innovation purposes influences the involvement of work-floor employees with innovation. It is emphasized by supervisory employees that creating a place where innovative topics are discussed, unlocks creativity of work-floor employees. This is emphasized by the senior real estate sustainability as:

> *"I think that we need other kinds of meetings. Then you should think of sparring sessions and brainstorm sessions. So, you need a place where people are triggered to think outside of the box. Employees should look beyond the daily job activities they perform. I do not believe that this could be engaged by sitting in a meeting room at the office. No, I think we should go to an unfamiliar place where people have minimum work associations and ask each other questions and conversate on innovative topics. Within this group you should particularly spend attention on the feeling of social safety such that employees have a feeling that they could do and say anything without being judged" (Senior RES).*

Nevertheless, The Residence have not set-up such a place as the interviewee mentioned. The Residence neither has a place for work-floor employees specifically for innovation. However, the findings come from a recent event where all teams of The Residence separately went to a place outside of the office and had brainstorm and sparring sessions. As a result, a lot of innovation initiatives derived from work-floor employees. Nevertheless, interviewees indicate that a place for innovation is currently lacking and that they wish for a day focused on innovation, a place for innovative purposes, or an innovation café. Therefore, we indicate that a physical reserved place for innovation meetings is an instrument that contributes to the idea generation phase during innovation routes.

*Central function and policy for innovation* – From the interviews we see that having a central function within the organization contributes to innovative performance. The main reason for this is to maintain awareness regarding innovation and projecting that innovation is important within the organization. Also, it is helpful to have a central innovation function when innovation emerges from work-floor employees as they may have questions or need help to put their ideas further into motion. In line with these findings, it is particularly important to have a system or a policy with goals concerning innovation. Many interviewees indicate that this is currently lacking at The Residence as explained by a senior real estate project leader:

> *"There is no such thing as an idea box, this may be a simple idea for centralizing innovation. Since there is no clear policy for innovation, I wonder if the management team wants innovation. Sure, we are very open to innovative ideas. But I think that we can open the doors even further for innovation to stimulate work-floor employees. Innovation is not enough supported from the management team in general. We at least need*

*someone who coordinates innovations and have a specific role for innovation or even a group of people who helps with innovations. We have no such thing" (Senior real estate project leader).*

Thus, it is important that the management team sheds a light on the importance of innovation as it otherwise may be experienced as if the organization does not have room for developing innovations. Although it is mentioned many times by interviewees that a policy on innovation is lacking, there actually is a central function for innovations at The Residence. Nevertheless, some interviewees are not aware that there is indeed an innovation team within the organization. The task of the innovation team is to facilitate and manage all innovations in the organization. This means that employees and teams can handle innovations by themselves but can use the innovation team for support. However, from the interviews becomes clear that the opinions are divided regards this innovation team and that it is not clear for every employee what the innovation team does and that it even exists as a central innovation function. A small group of the interviewees address their feeling that the innovation team steals ideas and that once an employee suggests an idea, they might develop this idea without including the individuals that came up with the idea as explained by a senior building manager:

*"The idea of having an innovation team is very good. However, it feels like not everybody is included within the innovation team. You must ensure that everyone is connected to this team to some extent otherwise you will not reach your goal. The innovation team does not empower employees. To do this, employees which suggest ideas must be included from the beginning till the end of the process and should receive credits for this in any form whatsoever" (Senior building manager).*

As a result, some employees tend to withhold their ideas till they find a better and more suitable way of putting their innovative ideas forward. In contrast, the innovation manager and innovation team chair state explicitly that they are not taking ideas from employees but that they facilitate everything such that an employee can suggest an idea and putting it forward into motion. We argue that a central function for innovation is a good instrument for positively influencing innovative performance throughout all the phases of EDI routes. Simultaneously, such a central function for innovation cannot effectively exist without a well-defined innovation policy with innovation goals provided by management.

*Sustainable employability* – We have seen from the interviews that sustainable employability positively influences the innovation performance of The Residence as opportunities arise for work-floor employees to be involved with innovation projects. Sustainable employability is deploying work-floor employees based on what they are good at and what they want in the long run rather than forcing employees to comply to a job description. Although the actual sustainable employability program has yet to come, team leaders are encouraged to already start conversations and adjust employees' job activities based on their competences. An example of such a sustainable employability change is explained by an internal data consultant as:

*"IT departments have changed a lot over the years and so have we. We are not a classic IT department with system administrators only. We have suggested that our job profiles could use a recalibration as it originates from 2005 and it contained only 25% of what we are doing currently. We did extra activities than was expected from us. Yet, nobody saw what we were really doing as IT department. We have had plenty of freedom to develop new job descriptions, if you can call it job descriptions. (…) More importantly, other employees are more aware of the things that we do as a team. Further, we have discussed extensively on*

*where people gain energy or where they lose work energy. This has resulted in a fresh new set-up team as we are now. Even the name of our team has changed" (Internal data consultant).*

Sustainable employability works at two levels. First, administrative tasks of work-floor employees are more and more replaced by automation solutions which may result in fear of losing jobs. Through conversations between team leaders and work-floor employees, the opportunity arose for employees to focus more on the activities they excel at. Second, giving employees the possibilities of doing tasks that give them energy, increases the enthusiasm of the employee during their job. It is emphasized by interviewees that they feel more appreciated and involved with the organization through this enthusiasm. As a result, work-floor employees suggest more ideas and are more involved with innovation projects.

*Multidisciplinary teams* – We identified that The Residence has a lot of projects and working groups that consist of employees of multiple teams, divisions and even third parties. This instrument is used to counteract on the compartmentalization that has developed at The Residence over the years. By including work-floor employees in a project group, expertise of individual employees is bundled for collective level results and altogether creative innovative ideas emerge. In other words, through such groups, individual work-floor employees get the opportunity to contribute to innovation. This is emphasized by a home finder and desk agent as:

*"I think that you need to have the right people on the right places. Recently, there was a project on how to improve customer satisfaction. I was not in it. But the working group existed of work-floor employees, team leaders and managers from several teams. The results were very good and primarily came from the work-floor employees in the working group. Through that project, that other teams are more aware of what we do in our daily work and I experience that we can do a lot more for the customer than before" (front-desk agent).*

The example shows an incidental multidisciplinary project group where The Residence have installed static multidisciplinary teams as well. Work-floor employees have the possibility of being part of such multidisciplinary teams. Through such teams, work-floor employees gain better relationships with employees from other teams and divisions. As a result, work-floor employees have access to more resources. Multidisciplinary teams are used as an instrument to gain more and qualitative better ideas. In contrast, interviewees argue that multidisciplinary compositions may obstruct idea development and idea implementation phases within EDI routes.

*Slack Time* – Finally, from the interviews we see that slack time is an instrument that influences innovative performance through EDI routes. Although the organization offers a lot of freedom to suggest innovative ideas and to participate in innovation projects, most interviewees indicated a lack of time to dedicate to innovation projects as their own tasks are already under a time pressure. There is no system that anticipates on this time problem during the development of innovations. In some cases, the team-leader provides time to certain employees to be involved in these projects as the original tasks are subdivided over direct colleagues. The HR manager and an HR advisor state that there is a possibility to receive slack time whereas this is not the case in view of work-floor employees and team leaders. Since recently, work-floor employees have the opportunity to submit overtime for

compensation if they are active in innovative projects. Nevertheless, this means that EDIs often emerge in the own time of employees. Despite for the drive to innovate from some work-floor employees, others may only be involved when time is provided by the team leader as explained by a customer service agent:

> *"If I really receive the freedom and time to participate in innovation projects without the hassle of arranging replacement for my tasks, I would participate. We are from a team which requires a certain occupancy rate. Our team is therefore sometimes excluded for participation in working groups while we have a lot of knowledge and ideas to bring in. I am not willing to give my free time up to participate in these projects" (non-involved customer service agent).*

Furthermore, we have identified a phenomenon we call a 'time paradox'. A time paradox means lacking time because existing tasks require more than an employees' time. At the same time, there are innovations that will reduce time of that daily tasks. However, there is time needed to develop such innovations. A senior real estate sustainability emphasizes this example as:

> *"You need to make time. I find OneNote an excellent example. I see a lot of advantages in relation to time reduction and I have tried working with that program. At a certain moment you end up at a point that it costs time to learn how the program can work for your benefit. If you do not have that time, you will never reach success of reducing time. The same holds for some innovation projects that lack time capacity to implement, which implementation is necessary for improving current processes" (Senior RES).*

Slack time is an instrument that influence how actively employees can be involved in EDI routes. A lack of time negatively influences innovative performance whereas slack time positively influences innovative performance of The Residence.

# 5. Discussion and conclusion

In this chapter we discuss our main findings in relation to the research question. Based on the case study at The Residence, the results revealed that employees contribute to EDI routes that follow a pattern through three phases characterized by idea generation, idea development and idea implementation. Each phase consists of multiple activities that shape the innovative outcome of each phase. Furthermore, our research shows that there are specific instruments that influence the abilities, the motivation and the opportunities of work-floor employees to better be able to contribute to EDI routes. An overview of these instruments and its relation to EDI routes is shown in table 4. Below, we first discuss the theoretical implications of this research in the context of our research model and existing literature. Secondly, we acknowledge the limitations that were encountered during the research supported by recommendations concerning future research. Finally, we state our recommendations for practical implementation of instruments for positively influencing innovative performance through EDI routes.

## 5.1. Theoretical implications

*Idea generation* - An innovative idea from an employee at The Residence is usually generated when awareness on innovation is created, thereafter ideas are created, and the possibility of idea onset is given. The idea generation phase is particularly a top-down initiated phase. As such, managers and supervisory employees influence how people feel and think about innovation before an innovative idea is suggested. These findings show that it is important to take the cognitive process of individuals into account when discussing EDI routes. In the investigation on idea generation it was understood that ideas did not emerge magically out of nowhere. Before an idea is generated, work-floor employees transubstantiate a process of incoming information that eventually forms an idea. We suggest that this is a continuous interplay of subconscious cultural influences and conscious influences where work-floor employees are exposed to. In an organizational context that is less focused on innovation, the subconscious cultural influences are less aimed towards innovation, a lower IWB is expected and thus work-floor employees will show less contribution in idea generation. Therefore, a more conscious way of top-down awareness creation and triggering idea creation may enhance idea generation. We interpret idea onset as the last activity of idea generation. During this activity we observed that most ideas are generated through interactions between team leaders and employees. The innovation team who consciously collect ideas and explicitly asks work-floor employees if they have ideas, gain less ideas. It is likely to think that ideas are more easily generated while conversating with leaders who are closer than submitting ideas in an innovation team who are not considered as direct colleagues.

Our theoretical explanation behind this finding derives from the understanding that employees who are showing IWB are motivated to share knowledge on their ideas (Andreeva et al., 2017). From our results, we agree this understanding. However, awareness on innovation, and idea creation on the individual employee-level requires

social interaction to generate ideas that are within individuals as indicated by Smith et al. (2012). We find such a social mechanism behind the idea onset activity that works as a so-called amplifier step to convert individual employees' ideas into a collective good in line with the emergent theory of Fulmer & Ostroff (2016). At The Residence, the team leader is especially an effective factor that produces social interaction through which ideas are suggested. We propose that high quality ideas are generated when single work-floor employees are continuously aware of the role that innovation plays, what they may contribute, and when they are constantly fed with external information and more importantly when leadership functions as social interaction mechanism that amplifies ideas from an individual employee-level to a multi employee-level.

**Proposition 1:** *A larger number and more high-quality ideas are generated when team-leaders or managers consciously and subtly feed work-floor employees with information regarding the organization's openness towards employee input and constantly suggest the possibilities of going to external events.*

**Proposition 2:** *Team leaders or managers function as a mechanism to help employees suggest ideas and amplify ideas further into the organization.*

*Idea development* – An innovative idea within an EDI route is ordinarily developed through the creation of a working group by whom subsequently a support base for the idea is laid which thereafter is established and submitted for official approval. The results demonstrate that it is of great importance to create support among employees and managers within the organization to provide the innovative ideas with more strength. There is still a lot of criticism by a group of older employees and the management team as they tend to fear innovations as indicated by the results. In line with this, innovations are particularly emerging and developed by younger work-floor employees and team leaders at The Residence based on self-initiative and drive. We also find that employees who participate in the development phase of innovation projects, require much patience as some employees and managers do not share the same belief in such innovative ideas. As a result, the idea development is characterized by a long time-cycle wherein extensive research and analysis is done to convince direct colleagues and managers on innovative ideas. This is a barrier for EDI routes to continue in the direction of implementing the innovative idea since much ideas are threatened to cease to exist as well as positive energy drains from motivated work-floor employees. The results highlight that employees who are showing unnecessary critical attitude need comforting to temper existing fears that may cause such critical attitude and that a prove of concept is required to convince managers.

We interpret from the study that groups are created first to prevent that innovative ideas are neglected. In a group, employees have common goals and use the group structure to keep each other accountable for reaching such goals (Han, Han, & Brass, 2014). Particularly, multidisciplinary teams help reaching goals collectively as many competences and knowledge becomes available within such a working group. However, this is slightly contradictory to team composition theories of Cox, Lobel, & McLeod, (1991); Smith et al. (2012); and Williams, O'Reilly, & O'Reilly

III (1998) by whom is implied that heterogeneity in a group does not advance idea implementation and development. In the extension of this argument, this is explained as groups preferably focus on experiences that they have in common rather than sharing their unique perspective (Paulus & Yang, 2000). We oppose this by arguing that multidisciplinary teams, which are often heterogeneous, do advance idea development as showed from our results. We identify that the activities within the idea development phase are closely linked as group creation influences the development of innovative ideas through creating support by employees and management. Furthermore, it is noticeable that we include idea development as a phase of EDI where other researchers focused more on the idea generation and idea implementation phase. Although development may be interpreted as a part of implementation, our results led us to focus more on idea development as a phase on its own.

**Proposition 3:** *The development of ideas enhances greater innovative success by multidisciplinary teams as they create support among employees within the organization for innovative initiatives. Moreover, multidisciplinary teams have more knowledge and motivational resources to complete extensive analysis to convince the decision makers to grant financial resources for idea implementation.*

*Idea implementation* – An idea that is implemented within an EDI route is first tested with a pilot project and next routinized in the organization. As a result, an innovation emerges as output of the EDI route. The implementation phase shows the importance of routinizing only after the innovation has proved itself on its test subject (De Jong & Den Hartog, 2010). The results highlight that every radical innovation is tested by a pilot project that represents the implementation of the innovation for a smaller and representative entity of the organization. The idea implementation phase is continuously exposed to evaluation, adjusting and optimizing the pilot project till the intended results as proposed to management are reached for the test subject (Ciriello, Richter, & Schwabe, 2016).

Many interviewees indicated that innovations that were tested through a pilot project, are rarely routinized even if the innovation proved success. We indicate that the lack of routinization has to do with the fear factor that becomes larger as the consequences for employees in the organization becomes more visible. Job security is a common terminology that is identified from the interviews. In a research of Bos-Nehles et al. (2017), job security is discussed as a understudied HRM practice and suggests that fear of being laid off is a key driver of job insecurity. However, from our results we argue that job insecurity also is caused by the fear of not being able to adjust to innovations, which is often showed with the older aged employees.

The results also show that the official settlement of innovations is a barrier as well. The routinization phase is the last decision-making moment for management and often is associated with high expenditures to purchase software or to close contracts. The fear of spending money at the management team is expressed by the high-quality evaluation documents that are required. We interpret that this fear of employees and management influences how the working group is also feared by judgement of the organization and that they may feel that success or failure rests on their shoulder. At least the requirement of a heavily substantiated evaluation document

is an indicator for a lack of trust in the working group. This has a negative effect on idea routinization. Conversely, if employees and management show support, this is very conducive for making the innovation successful. We believe that trust is the key to overcome such problems. We rely our findings on Agarwal (2014) who imply that two-way trust positively influence IWB. Furthermore, the results highlight that implemented innovations are continuously evaluated and optimized. We believe that EDIs boost such optimization processes of implemented innovations as employees feel more related to EDIs than to innovations that are implemented top-down. In the other direction, top-down implemented innovations showed a lower acceptance by work-floor employees whereas managers tend to trust top-down implemented innovations more. Our results imply that managers have more trust in ideas from other managers or hierarchical higher individuals where work-floor employees should perform overly extensive analysis to win the same trust of managers. Although EDIs are slightly more trusted by work-floor employees than by managers, still a fear and distrust exist throughout our findings.

**Proposition 4:** *Fears from employees and fears from management towards innovations withhold the routinization of EDIs as these innovations are not fully trusted as well as the employee-innovators are not fully trusted.*

*Ability enhancing support instruments* – The case-study resulted in identifying support instruments that influence the innovative performance of an organization through enhancing abilities of the workforce. Abilities of work-floor employees can either be utilized and enhanced. Within this study, knowledge appeared to be a factor that may already exist within individual work-floor employees. Nevertheless, employees are often stuck in their day-to-day business and do not use specific knowledge which may be very relevant to the organization regarding contents of innovation. In the case study, we identified that this knowledge is utilized by the team leader who encourage and empower employees to keep looking for more efficient ways of working. Susanty, Yuningsih, & Anggadwita (2019) emphasize the importance of knowledge utilization of employee knowledge and suggest that leaders should provide work satisfaction and welfare for all employees as well as leaders should improve bottom-up communication and knowledge exchange to lower barriers for knowledge sharing.

Enhancing knowledge is stimulated by offering freedom to work-floor employees to look beyond their daily tasks and to look outside the organization. Work-floor employees make use of these possibilities by signing up for education, courses, training, and events individually and in a group context. In line with existing literature, we suggest that enhancing knowledge helps to increase individual work-employee's abilities, that increases IWB and in turn as well influences idea generation (Bos-Nehles et al., 2017; Knol & Van Linge, 2009; Pratoom & Savatsomboon, 2012). However, we add events to the classical view on training and development as examples of our results show that when work-floor employees go to external events such as lectures and congresses, they engage more in the idea generation phase and thus influence EDI routes. We also interpret this phenomenon of commitment in idea generation in line with social exchange theory of Blau (1964) wherein work-floor employees reciprocate gratitude in the form of participation (Sanders, Moorkamp, Torka, Groeneveld, & Groeneveld, 2010).

We see that work-floor employees who have enhanced their abilities significantly have a team leader who give much personal attention to each of the team members. Additionally, we found that an increase of participation in idea generation emerges when the team leader is focused on innovations during interactions with team members.

| Instrument | AMO Category | Mediators | Influence on EDI phase |
|---|---|---|---|
| *Knowledge utilization* | *Ability enhancing* | *Work satisfaction, welfare, bottom-up communication, and leader-member relationships* | *Idea generation; idea development; idea implementation* |
| *Knowledge development* | *Ability enhancing* | *Individual attention towards team members, stimulate to attend events* | *Idea generation* |
| *Recruiting for the future* | *Ability enhancing* | *Younger age employees with abilities* | *Idea generation* |
| *Long-term strategy radiation* | *Ability enhancing* | *High visibility of organizational long-term strategy and vision* | *Idea generation* |
| *Non-financial rewards* | *Motivation enhancing* | *Continuous appreciation and recognition of intrinsically motivated employees* | *Idea generation; idea development; idea implementation* |
| *Sharing successes and setting examples* | *Motivation enhancing* | *Continuously exposing employees to innovation successes through face-to-face and electronic sources* | *Idea generation; idea development; idea implementation* |
| *Electronic platforms* | *Motivation enhancing* | *Dialogue enhancing communication and innovation planning platform* | *Idea generation* |
| *Trust* | *Motivation enhancing* | *Leader-member relationships, few interferences by leaders* | *idea development; idea implementation* |
| *Free innovation budget* | *Opportunity enhancing* | *Granting free budget, lowering barriers, shorten lead times* | *Development phase* |
| *Facilitating and servant leadership* | *Opportunity enhancing* | *Safe space, coaching and mental support, leader-member relationships,* | *Idea generation; idea development; idea implementation* |
| *Physical place for innovation meetings* | *Opportunity enhancing* | *Places that have no relations to daily work activities* | *Idea generation* |
| *Central function and policy for innovation* | *Opportunity enhancing* | *Electronic platform, clear view of innovation landscape* | *Idea generation; idea development; idea implementation* |
| *Sustainable employability* | *Opportunity enhancing* | *Enriching and changing job design towards the interests of individual employees* | *Idea generation; idea development; idea implementation* |
| *Multidisciplinary teams* | *Opportunity enhancing* | *Competence and expertise bundles* | *Idea generation; idea development; idea implementation* |
| *Slack Time* | *Opportunity enhancing* | *Top-down provided time* | *Idea development; idea implementation* |

*Table 5: Instruments and their effect on EDI phases*

Another way to enhance abilities is through attracting and recruiting employees (Liu, Gong, Zhou, & Huang, 2017; Susanty et al., 2019). One particular team at The Residence showed a lot of innovative successes after employees were recruited. Especially peculiar is that these new employees were at least 10 years below the average age of all existing employees of the organization. It is not generalizable that older age employees or employees that are employed for a longer time are less innovative (Innocenti, Profili, & Sammarra, 2013). This point is opposed by

Pfeifer & Wagner (2014) by whom is stated that employees over 50 years old significantly negatively influence innovative firm performance. We view this finding as a combination of innovation fatigue through negative experiences regarding innovation projects and the actual resourcefulness of older age employees. Also, recruitment of employees showed a positive effect on the IWB of existing employees as they were taken along in the enthusiasm of the new employees. Another assertion is that the overall abilities of the workforce grows as new employees are selected and recruited for the missing abilities of the current workforce (Goll, Johnson, & Rasheed, 2007). We interpret these findings that above-mentioned arguments of recruitment are closely linked to each other and increases the overall abilities and thus has a positive effect on innovative performance.

Furthermore, the results highlight that the lack of visibility of the long-term strategy of the organization negatively affects the work-floor employees' ability to be innovative. Work-floor employees may have no idea what and how they can contribute to innovation when there is no clear vision for innovation. The case-study point out that the lack of knowledge on current events and strategy of the organization causes high compartmentalization such that 'reinventing the wheel' projects emerge. Inversely, we suggest that a visible long-term strategy concerning innovation, trigger the abilities of work-floor employees to suggest ideas in line with this strategy and to be involved with innovation projects (Nwachukwu, Chladkova, & Fadeyi, 2018). Nevertheless, the organizational strategy on innovation practices may still not be understood by all employees (Rexhepi, Ibraimi, & Veseli, 2013).

A key finding from the results is that abilities indeed influences innovative performance through EDI routes. More specifically, we interpret with our findings that knowledge utilization, knowledge enhancing, relational contracts and a visible top-down focus on innovation influences the overall abilities of the workforce to contribute to innovation practices. These findings are consistent with knowledge capability literature of (K. G. Smith, Collins, & Clark, 2005).

**Proposition 5:** *Abilities are mainly knowledge-driven and are enhanced through utilizing existing knowledge, giving freedom to work-floor employees to gain and develop their knowledge. Combining this with the clear radiation of the innovative themes that are part of the long-term organizational strategy influences innovative performance.*

**Proposition 6:** *Abilities are enhanced when leader-member relational contracts are closer. Through such relationships, discussing innovation topics influences idea generation positively.*

**Proposition 7:** *Recruiting skilled and younger age employees increases the innovative abilities. Increasing abilities of the workforce has a positive influence on innovative performance through EDI routes.*

*Motivational enhancing support instruments* – Results from our research indicate that motivational instruments can be used in order to involve work-floor employees in innovation practices. The case-study highlight the intrinsic motivation that exists at a large part of the work-floor employees. Despite for the intrinsic motivation, work-floor

employees still receive non-financial rewards. The results show that continuous appreciation and recognition from direct colleagues and supervisors for effort is the most effective instrument to keep and gain employee involvement during innovation activities. However, in line with Janssen (2000) we found that effort-reward fairness is required to involve work-floor employees during ongoing innovation projects for two reasons. First, employees who are not compensated financially for their capability potential develop a resentment towards the organization for not seeing their potential. Such work-floor employees might not share valuable input as a result. Second, work-floor employees whose innovative ideas are developed and implemented show more intrinsic motivation to put full effort into the project than colleagues who did not suggest any ideas or whose ideas are not chosen to develop (Zhang & Begley, 2011). Other employees may be intrinsically motivated, yet at another level which requires to be compensated with financial resources for their hourly effort. Generally, we support the theoretical understanding that financial rewards reduces employees' motivation for engaging in innovation projects if existing motivation is from intrinsic nature (Bos-Nehles et al., 2017; Sanders et al., 2010).

Another instrument that is found to support EDI routes by motivating work-floor employees is to constantly share innovative successes and show examples of innovations. The results highlight that creating enthusiasm is a key factor behind such sharing of innovative success that motivates work-floor employees extrinsically to be involved with innovation projects (Antikainen, Mäkipää, & Ahonen, 2010). We interpret from the findings that it is important to expose all employees to the innovative activities that are being undertaken. By continuously feeding work-floor employees with news on successful innovations and the involved employees, an example is set for what is appreciated from employees. The Residence uses electronic platforms to share such innovative successes. Highly positive messages and appreciation are expressed throughout social media and SharePoint for example. We found that this positivity motivates other employees to participate in innovation activities. An interesting point from Gressgård, Amundsen, Aasen, & Hansen (2014) is that electronic platforms such as intranet often lack possibilities for debate of dissent. The content is often generated by a small group whereas internal social media may increase such possibilities for communication (McAfee, 2006). We suggest that organizations should use electronic platforms that support two-way communication to create a dialogue between the innovators and the work-floor employees that are not yet involved in innovation projects.

Work-floor employees are found to be motivated by the feeling that they are being trusted and in turn reciprocate discretionary effort through suggesting innovative ideas and participate in innovation projects. From our results we see a lot of similarities between the projected trust which interviewees speak about and autonomy (Bos-nehles et al., 2016). Autonomy is the extent of freedom, independence, and discretion that an individual employee has to schedule work and to execute this (Hackman & Oldham, 1980). We interpret that the trust that is felt expresses the extent of autonomy that is given. In line with Bäckström & Lindberg (2019) we suggest that if work-floor employees feel trusted, it exposes the extent of autonomy that is socially accepted. Nevertheless, the results highlight that autonomy cannot be granted with the same extent to every single employee as trust requires growth over time through a leader-member relational contract. Collaboration, conversation, openness, and

transparency can help such relationships to grow. We indicate not only that the person requires to be trusted but as well the capabilities of individuals needs to be trusted. Trust as an instrument requires a longer-term effort from as well leaders as from employees. From our findings we suggest that leaders should not interfere too much with the tasks of employees in order to get a feeling of being trusted which will positively influence idea development and idea implementation phases of EDI routes (Marane, 2012).

**Proposition 8:** *Motivating employees to be involved in innovative projects requires particularly non-financial rewards which represent a gesture of appreciation and recognition. Non-financial rewards influence how work-floor employees keep or gain involvement in innovative activities and thus positively affects innovative performance.*

**Proposition 9:** *Organizations should expose all employees continuously to recent achieved innovative successes both face-to-face as through two-way electronic communication platforms to start the conversation on innovation to create enthusiasm and motivate employees to participate and keep participating in innovation activities.*

**Proposition 10:** *Employees require being trusted by supervisors and managers to untroubled contribute to idea development and idea implementation. Trust develops through relationships, collaboration, conversation, openness, and transparency and grows over time. When trust is precepted by work-floor employees, the extent of autonomy that may be utilized is clearer to such employees and will be used with more confidence in advance of innovative performance.*

*Opportunity enhancing support instruments* – Results of the study show critical opportunity ingredients that are necessary for work-floor employees to influence innovative performance through EDI routes. Work-floor employees who are able and motivated to contribute to innovative success of an organization, still require the possibilities to contribute. Also, it would be a waste if abilities and motivation were not used for the sake of innovative performance (Maselkowski & Grottenthaler, 2014). From the results we identify that offering a free innovation budget to teams accelerates innovations and influence the innovative performance of the organization. This instrument lowers barriers for work-floor employees for idea suggesting, avoid time-consuming management decision making, and exorbitant research. These results are in line with existing trust issues that withhold employees from participating in innovation activities. If top-down budget is given for the purpose of innovation in general per team, work-floor employees start to feel trusted if the budget holder manages this budget wisely. Such authorization below a certain amount is new to EDI theory.

Facilitating and servant leadership is identified within the research as instruments that facilitate work-floor employees to put any innovative ideas into motion. As abilities and motivation may be expressed by IWB, work-floor employees still require other resources to develop and implement ideas. The case study shows that facilitating leadership is offered by the team leader or the innovation team where the employee has the choice to

stay the owner of the innovative idea. Additionally, servant leadership has found to influence EDI routes. It is important for work-floor employees to work at a safe space, where there is room to be open and vulnerable provided by leaders (Hirst, van Dick, & van Knippenberg, 2009). Coaching and mental support from supervisors opens opportunities for EDI through building relationships and interaction. The results highlight that facilitating and servant leadership are closely linked forms of leadership that as well motivates as give opportunities for work-floor employees to contribute to innovation through EDI routes. This is in line with findings of Yoshida, Sendjaya, Hirst, & Cooper (2014) who add that the mediated effect of servant leadership is strongest if the innovative team environment is high.

A physical place for innovation purposes is a support instrument that gives the opportunity to work-floor employees to spend specific time on innovation at a place that has no connections to the daily work context. Ideas for this are widespread as we can think of any place that is not relatable with day-to-day tasks. We interpret these findings that employees associate their workplace to their job activities, where innovative ideas often transcend the daily work activities (Peschl & Fundneider, 2012). Therefore, we argue that a physical place for innovation helps triggering creativity to support idea suggestion. Preferably, the place for innovation purposes should also be changing from time to time to set employees loose from associations with previous innovation meetings.

Sustainable employability is highlighted in our case study as an opportunity instrument that influences innovative performance positively. Sustainable employability means achieving tangible opportunities that meet necessary conditions that allow employees to make valuable contributions through their work now and in the long-term, while protecting health and welfare (van der Klink et al., 2011). According to Sen (2007), sustainable employability is determined by how individual employees are able of converting resources into capabilities, and how these capabilities are utilized within work functioning such that the values security, recognition, and meaning are met (van der Klink et al., 2016). In practice we see that sustainable employability is used as an instrument by HR to assess whether employees are currently satisfied with their job and whether they prefer or can contribute elsewhere within or outside the organization. Results from our research show that work-floor employees are more and more deployed on other places within the organization and develop capabilities in which they excel at with increasing job satisfaction (Astakhova & Porter, 2015). As a result, work-floor employees secure their positioning within the organization, feel more valuable to the organization and tend to be involved more with the organization. We compare this to the kind of enthusiasm that appears when employees are recruited. Birkinshaw & Duke (2013) argue that enriching or changing the initial job description help to let employees think outside their formal roles and have space for creative thinking.

Our findings show that The Residence lacks an innovation policy and indicate the absence of a central system regarding innovation. As a result, a lot of confusion prevails work-floor employees as they do not know what their role is concerning innovations. Our research indicates that not all employees are aware of the place that innovation takes within the organization. We suggest that work-floor employees need to be reminded of what the organization stands for regarding innovation and which people and functions may help work-floor employee

facilitate the contribution to innovation. Moreover, a central innovation function should be initialized as well as key innovators should closely collaborate with department or team supervisors (Chatenier, Verstegen, Biemans, Mulder, & Omta, 2010). Particularly important is that all parties within the organization can easily be aware of ongoing innovations and suggested innovative ideas. We refer to Gressgård et al. (2014) to extend the earlier mentioned argument for an electronic platform that facilitates two-way communication for innovation purposes as it supports a centralized informative visibility of innovation. We interpret that as employees have a clear view on the innovation landscape, the opportunities of contributing to innovative performance through EDI routes is more transparent (Birkinshaw & Duke, 2013). This will result in a positive influence on innovative performance.

One of the most important opportunity enhancing support instrument for work-floor employees is the possibility of receiving slack time to work on innovation projects (Birkinshaw & Duke, 2013). From the case study we see that there is a difference between departments and teams in how they allocate slack time to employees. For some work-floor employees it is thus relatively easy to actively be involved during innovation projects whereas other work-floor employees may have to work on innovations in their own time. Employees who are involved with innovation projects in their free time, show in the long run a lower level of IWB. Also, energy may drain from such employees. As a result, work-floor employees have little energy left for daily tasks which causes proceedings to backlog (Ohly et al., 2006). However, if work-floor employees receive slack time, they may suggest, develop and implement innovative ideas that lowers the time pressure on their daily tasks with the additional opportunity to use that saved time for new innovative ideas. We call this the 'time paradox'. Therefore, we suggest that work-floor employees should have the right of slack time provided from a top-down perspective to influence that work-floor employees could use that time to be actively involved with innovation projects. Slack time thus positively influences innovative performance.

Furthermore, we state that opportunity enhancing instruments show a strong coherence with motivation enhancing instruments and that abilities are enhanced through motivation enhancing instruments. We suggest that the AMO framework is a multiplicative model that is a function of innovative performance (Bos-Nehles, Van Riemsdijk, & Kees Looise, 2013; Pringle & Blumberg, 1982; Siemsen, Roth, & Balasubramanian, 2008; Uyargil & Ozcelik, 2015). For example, work-floor employees tend to show criticism when it is not possible to innovate what they want to pursue. Through making it easier for work-floor employees to contribute to innovative performance, work-floor employees feel that it is appreciated that they contribute to innovation. As a result, work-floor employees are more motivated to enhance their abilities and contribute to innovation through EDI routes. For instance, when an individual work-floor employee is given the opportunity by giving time and financial resources this motivates the employee as others may be motivated by the set example as well. Visa versa, we have not found specific evidence that motivational instruments give opportunities for work-floor employees to contribute. Nevertheless, motivation enhancing instruments such as sharing of innovative successes and electronic platforms provide work-floor employees with information which thus affects the abilities. Such enhanced abilities also influence the motivation dimension. For example, when work-floor employees develop their abilities they tend to

be motivated to put developed skills into action (Kuvaas et al., 2012). In other words, we view the AMO framework as a multiplicative model which suggests that the presence and interaction of ability, motivation, and opportunity affects innovative performance. Yet, the approach is not entirely multiplicative in all directions as well as interactions differ in strengths as well (Bello-Pintado, 2015; Knies & Leisink, 2014).

**Proposition 11:** *Resources such as time and budget enhance opportunities for work-floor employees to contribute to innovative performance through EDI routes. Providing slack time and a free innovation budget has a positive influence on innovative performance.*

**Proposition 12:** *Facilitating and servant leadership create opportunities for work-floor employees to contribute positively to innovative performance through help gathering the needed resources, mental support, coaching, interaction, sustainable employability and relationship building. Using this form of leadership will result in higher innovative performance.*

**Proposition 13:** *A central innovation function influences innovative performance as it facilitates resources that employees do not possess. An electronic platform by which two-way communication and innovation sharing is provided, supports facilitating opportunities for work-floor employees.*

**Proposition 14:** *Opportunity enhancing instruments positively influences motivation levels of work-floor employees whereas motivation enhancing instruments affects the overall ability level. An increased ability level subsequently has a positive effect on motivational levels of work-floor employees. Furthermore, the absence or weak presence of one of the AMO dimensions negatively influences innovative performance.*

Concluding, this research contributes to current knowledge by (1) exploring how EDI routes emerge, (2) investigate how work-floor employees can contribute to the different phases of EDI routes, and (3) examining which instruments influence work-floor employees to actively contribute to innovation and how this influences the innovative performance of an organization through EDI routes. We found that (1) EDI routes emerge through an idea generation phase, an idea development phase, and an implementation phase (2) through which phases work-floor employees contribute to activities underlying the EDI phases (3) which contribution can be influenced with four ability enhancing instruments (knowledge utilization, knowledge development, recruiting, and long-term strategy radiation); four motivation enhancing instruments (non-financial rewards, sharing successes, electronic platforms, and trust); and seven opportunity enhancing instruments (innovation budget, facilitating and servant leadership, physical place for innovation, centralization, sustainable employability, multidisciplinary teams, and slack time).

The theoretical implications led us to further develop the initial theoretical model of figure 1. Based on a model from Renkema et al. (2018), we delineate an emergence-based approach of EDI in figure 11 that models how employees' innovative ideas turn into innovations and that support instruments underlying the AMO framework have an influence on how collective-level innovations are reached. The model also represents the stated propositions from the theoretical implications.

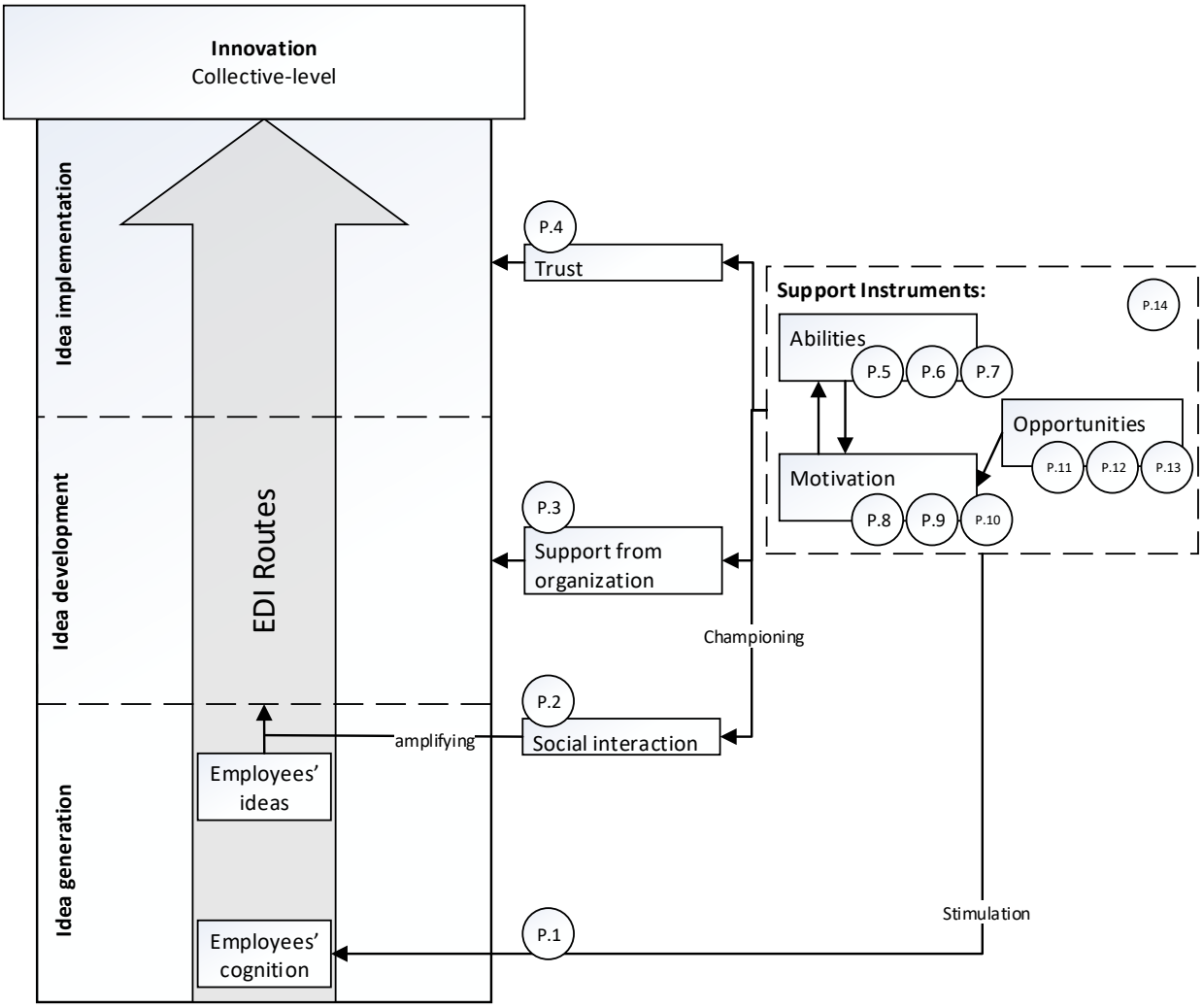


*Figure 11: Model of support instruments influencing EDI routes towards collective-level innovation*

## 5.2. Strengths and limitations

The data used in this research are transcribed interviews and innovation documents that are provided by the innovation manager. We argue that the data from the interviews is very strong as the interviews show a lot of linkage. For example, interviews with work-floor employees referred to cases of innovations that were recurring to most of the interviews. Also, interviewees mentioned colleagues that were as well in the sample of interviewees

allowing us to analyze different perspectives of EDI. Our selection of interviewees contributed to the strong data as well since we focused on selecting interviewees that are related to each other through hierarchical relations from two different divisions of the organization. This led to in-depth information on the innovation processes in different organization contexts. Also, we have interviewed employees that are related to both divisions simultaneously that helped us understand the differences that employees experience in such divisions. Nevertheless, we acknowledge that interviewing more work-floor employees may strengthen our research by displaying more employee voice.

Our first contact was with the innovation manager. The innovation manager provided us with information about an innovation team that facilitate innovations from a staff function. We expected to find results that highlight how such an innovation team influence the innovative performance through EDI routes. Nevertheless, most innovative ideas that derive from employees are put further into motion with the help of team leaders. We see this as a limitation to this research as well as a lesson learned for organizations to use a more facilitative and servant approach with such innovation teams.

Although we tried to steer the interviews in a semi-structured way, still work-floor employees tend to speak of the general whereas supervisory employees, team leaders and managers were more specific on process details and drivers behind that processes. Moreover, we had more interviewees from the real-estate division than from the housing division. Additionally, real-estate work-floor employees were more talkative then work-floor employees from the housing division. From the interviews we concluded that this has something to do with leadership style from team leaders as well as negative historical events that influenced the view towards innovation for the employees of the housing division. Furthermore, we found that work-floor employees that were indicated as non-involved in innovation practices in the interviewee selection process turned out to be involved to some extent with recent or ongoing innovation projects indicating that employee involvement is high at The Residence.

What could have strengthened the results from our research are specific evaluation and innovation documents on recent and ongoing innovation projects. We could have used that to check if examples of innovations from interview data on the innovation processes are in line with the documents on such innovations. Unfortunately, we had no access to such evaluation and innovation documents as they were either lost or not available in the term that we did our investigation. We further highlight that data triangulation paid off in advance of the research results as a holistic view emerged through observation, interviews and innovation strategy documents.

The findings of this research provide the EDI topic with knowledge that there is an existing system for how work-floor employees can contribute to EDI routes. These findings give insight in the pattern that EDI routes follow and where during these EDI routes work-floor employees have influence on the innovative performance of an organization. We find that EDI routes can differ dependent on the content of innovations, the scope of innovations, the innovation size, employees' relationship with supervisory employees, employee age and time they are employed, employee characteristics and the department. Due to time constraints of the research project and the

current focus of the research question we have not investigated these dependencies. We recommend that future studies investigate how the dependencies influence the way an EDI route emerges.

The results of the research indicate that there can be found a main EDI route where some cases show irregularities from the main route as predicted from the theory section of this research. These non-linear relationships require more understanding in line of sensemaking strategies of Schroeder et al. (1989); Burgelman (1983); Langley (1999); Mohr (1982); and Rogers (2003). We need more understanding on how context-dependent variables influence the emergence of EDI routes and how this influences organizational innovative performance.

Furthermore, we contribute to the literature of EDI by suggesting three EDI route phases. Our understanding of EDI routes extends the model on EDI routes of Renkema et al. (2018) by specifying how routes emerge bottom-up through phases and activities. Yet, this research approaches innovation routes differently. However, from our research becomes clear that in practice a hybrid form of the organizational route, the formalized-system route, and the project-initiative route exist next to each other throughout the main EDI route.

Our results have gained additional knowledge on how interaction between multilevel employees is important to reach collective-level innovation output. We see that instruments as facilitating and servant leadership, trust, innovative success sharing, sustainable employability, and visibility of the long-term strategy are all social instruments that are linked to each other and have an influence on employees abilities, motivation as it also opens up opportunities to contribute to innovate. The results show that team leaders at the case study organization function as a social interaction mechanism that subtly feed employees with little parts of information to move work-floor employees to contribute through EDI routes. Although we found instruments and factors that seem to be individually affecting innovative performance, we expect that it is the combination of social mechanisms and cognitive processes in a certain context that influence work-floor employees to drive innovations. Future research should focus more on how such cognitive processes work and how the instruments from this research cognitively influence work-floor employees.

We also find several factors deriving from our discussion that need more support which we could not find in existing literature. First, we identified that age and years of employment is a contingent factor that influences the innovative abilities of the work force. We suggest that further research should investigate the matter of years of employment and what influence it has on innovative performance. Second, we suggest an unfamiliar and innovative enhancing physical place for innovation purposes as employees have work-related associations while innovation requires employees to think outside of their daily activities. We propose that the location should also change from time to time as employees otherwise have associations related to previous innovative ideas which can affect their innovativeness. Future research should investigate how different locations, settings and interior for locations as well as innovation labs influence the innovative output. Third, electronic platforms that provide possibilities for two-way communication to discuss on innovative topics are promoted throughout this research. However, we see that two-way communication does not only count for an electronic platform, but that it is the desire of a work-floor employee to interact on what is going on within the organization on topics such as innovation.

Electronic platforms can help with this by managing and centralizing information on innovations such that an open innovation culture emerges. We suggest that future research should focus on how such electronic platforms may be set-up without becoming just one of the many information systems that organizations already possess.

## 5.3. Management implications

Our findings suggest that enhancing innovative performance of an organization by using the abilities of work-floor employees is certainly possible. Although the results are context-related to a semi-public housing association in The Netherlands, we generalize our findings to some extent to make these implications more concrete. We argue that EDI routes are already existing in organizations as where work-floor employees suggest an innovative idea, an EDI route emerges. This also holds for when existing innovation projects are supported with input from work-floor employees who then participate in the development or implementation of innovations. We speak of EDI routes when a single work-floor employee with own considerations joins innovation projects. Our results imply that it is valuable to let work-floor employees contribute to radical innovations because of the intrinsic motivation of these work-floor employees to volunteer with dedication to make the organization better. It is time that organizations trust these best intentions. However, one cannot expect that work-floor employees or any employee, or manager have all what it takes to drive innovations entirely. Therefore, we provide some guidelines for organizations to help work-floor employees with their contribution to innovative performance.

First, managers and supervisory employees should consciously but considerately feed work-floor employees with information about how open the organization is towards the input of employees and innovation. For example, the management team could have a short meeting with teams and departments to give a presentation or talk about what the organization desires to do in the future regarding innovations. Or else, team leaders may recognize and appreciate IWB publicly to suggest desired behavior. Furthermore, the organization should expose recent innovative successes to work-floor employees in an ongoing process. During face-to-face interaction as well as through a two-way electronic communication and sharing platform, continuous conversation about innovation is required as work-floor employees become more aware, fear is decreased, and motivation arises within work-floor employees. Managers should be more aware of the capacity that is within all individual work-floor employees. Our research suggests that for some time resources in return, employees can attend events and acquire information that may be very useful to the organization. With precaution, supervisors of work-floor employees should extract this information in the form of innovative ideas. Therefore, supervisors should interact with employees focus idea generation on what is important for the organization instead of what is possible in the world. We highlight that supervisors of work-floor employee are extremely important as they are the first point of contact for work-floor employees before they can contribute to innovation. Supervisors are the amplifier for the innovative voice of work-floor employees.

Second, after ideas are suggested there is a great need for support. Individuals may be sensitive for feeling supported. If a single work-floor employee is not supported by management or its direct colleague, the innovative idea has a low chance of success. However, when others are involved, the feeling of being supported is stronger as in a group that pursues the same thing, individuals support each other. Especially multidisciplinary teams should be used more to develop ideas as heterogeneous bundles different expertise which is convenient for executing project-based work. Also, such multidisciplinary teams can bypass bureaucratic formalizations as different teams, departments or divisions are more connected through the members of such teams. We found that it as well can be used as an instrument to solve compartmentalization problems in organizations. Organizations should consider installing multidisciplinary teams that contains people from more than three teams or departments under which employees who are influenced in their daily tasks by the innovative idea, employees who are open to be involved and for larger projects, hiring expertise from outside the organization.

Third, routinization is a very important, yet sometimes neglected step for the implementation of innovations. We found that fears from employees and from management boards withhold such routinization. This is because the multidisciplinary team that tries to routinize an innovation may experience serious setbacks that leaves them despondent. We found that trust can resolve fear. Nevertheless, starting to trust each other suddenly is not an easy task. Organizations should initialize social activities to give opportunities for individual employees to connect with each other. Moreover, supervisory employees should more conscious built relationships with work-floor employees.

Fourth, from an HRM point of view, it is logical to invest in the abilities of employees. In this study we found that enhancing abilities of the workforce has a positive influence on innovative performance. One of the key drivers of ability enhancement is knowledge. We argue that an organization must be aware of the knowledge and information that is hidden within single work-floor employees. Therefore, we emphasize the importance of extracting relevant knowledge and utilizing this before. Some organizations will do well if they first try to extract current knowledge from work-floor employees before enhancing knowledge and abilities. In some work-floor employees might be resting unawaken talents. We predict that it is as well appreciated by work-floor employees when supervisors start showing interests that they have unintentionally not showed for years. Furthermore, enhancing abilities through education, courses, training, and events has a positive effect on innovative performance. We often confuse knowledge with information that is learned from such education, courses, training, and events. However, knowledge enhancement is more when cognition is included. We emphasize that cognition is understanding the current events of an organization, including themes within a long-term organizational strategy and understanding what other teams, departments or divisions do to contribute to the collective level output of organizations. This kind of knowledge can be especially enhanced through an improved relational contract with the supervisor because relations throughout hierarchical level help see the whole picture. Also, recruiting employees is a proper way of increasing the overall abilities of the workforce when this is not at the expense of existing

employees of course. New employees who are as well selected on their competences concerning innovation, may also be catalysators in convincing existing employees that innovation is a good thing.

Fifth, we suggest that appreciation and recognition are important motivating factors. Work-floor employees may gladly receive financial rewards for effort. Nevertheless, it is not as effective as non-financial rewards. Especially intrinsically motivated employees tend to contribute to innovation when they feel recognized and appreciated by direct colleagues, supervisors, and managers. However, it is only fair to compensate work-floor employees for discretionary efforts when they invested own time in innovation projects. Furthermore, giving work-floor employees possibilities to contribute to innovative performance is motivation enhancing as well because opportunities give work-floor employees the feeling of being taken seriously.

Sixth, this research indicates that opportunity enhancing instruments are resources such as time and budget. We argue that organizations should allocate innovation budget that is free to spend on pilot projects or small innovations to increase the speed and lower the boundaries of such innovations. A common investment for pilot projects lies around 3000-8000 euro. Most innovative ideas exceed team and department boundaries. Such departments and teams should try to collaborate through multidisciplinary teams to divide pilot project costs.

Finally, we see that facilitating and servant leadership creates opportunities for work-floor employees to contribute to innovative performance. This instrument is however a central instrument that is conditional for all other instrument to have influence on work-floor employees. First, the most important driver for employees to reciprocate effort for the organization is if they feel appreciated and recognized. We belief that leaders should develop trust for work-floor employees and their abilities as well as leaders should give work-floor employees reasons to be trusted. Furthermore, our findings suggest that as trust between work-floor employees and their supervisors grow, fears that are felt with employees and managers towards innovations are decreased. Second, without the effects of facilitating and servant leadership, innovative performance is almost impossible to reach through EDI routes. This is because work-floor employees cannot understand the organization by themselves, cannot reach the required resources alone, and require mental support and coaching to utilize and develop abilities, to be motivated for suggesting ideas and participate in innovation projects, and to facilitate the road for putting innovative ideas into motion. This means that managers should try to set aside their own intentions and carefully begin to listen what others intend. From this research we especially endow to be more aware of what others in the direct environment need and we challenge to help each other with love as we believe that this supports personal growth that in turn enhances innovation and organizational growth.

## 5.4. Conclusion

In sum, work-floor employees contribute to EDI routes through innovative activities that shape outcomes of an idea generation, idea development and/or idea implementation phase. We conclude that EDI emergence is characterized by a dynamic nature but that patterns of events can be identified. From these patterns we see that

first top-down stimulated signals triggers employees' cognition which consequently turn into ideas. As such, ideas come to life and turn into actions when interaction between two or more employees amplifies innovative ideas into a collective level innovation. The most important results from this research is that along the way of an EDI route, there are many factors that influence how innovations come about. From this research, instruments have been extracted that showed us how collective-level innovation output in the organization can be influenced. We conclude that work-floor employees are excellent sources for innovation and that there are ways to be more aware about the value of organizations' greatest resources. We particularly state that EDI becomes effective when relationships between individuals are build. Throughout social relationships with direct colleagues and supervisors, fifteen instruments enhance abilities, motivation and opportunities allowing organizations to reach high innovative performance with the drive of individual work-floor employees.

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# 7. Appendices

## Appendix A: Interview protocol The Residence

**Introduction** *Work-floor employee*

- Informal and personal introduction
- Introduction of the research, case study, compliance and anonymity, and the process.
- How would you describe your function/job at The Residence?

**Innovation and process**

- What is the role of innovation within The Residence? What are the possibilities for employees to participate in innovation practices?
- How often do you think of possibilities for the organization to renew? What examples can you give of such ideas?
- Have you ever been/are you involved in innovation processes? If not, do you want this? If not, what reasons can you give for not being involved? What examples do you have?
- Can you explain which steps the innovation process consists of when you might have an idea? How different are these steps dependent on the content of the innovative idea?
- When in the innovation process do you need to interact with colleagues/supervisors?
- To which extent is it clear what you need to do when you have an idea or when you are involved in innovation processes?
- How do you describe the freedom to come up with ideas and bringing them forward?

**Support** (if applicable: questions are related to the mentioned innovation example)

- What are the most important aspects that stimulate(d) the innovation process?
- What are the most important aspects that hold/held back the innovation process?
- Which instruments are used by the organization to stimulate employees to come up with innovative ideas?
- Which instruments are used by the organization to stimulate employees to be involved during the implementation of innovations?
- To what extent do you consider yourself able of contributing to innovation processes?
- How does the organization stimulate you to develop their capabilities and abilities to better be able to suggest ideas and help developing innovations?
- To what extent do you consider yourself motivated to contribute to innovation processes?
- How does the organization motivate you to suggest innovative ideas and being involved in innovation processes?
- What opportunities are given by the organization to give employees space to generate innovative ideas or to engage in innovative processes?
- What do you need to come up with (more) ideas or to be involved in innovation processes?

**Closing**

- How would you evaluate the current innovation performance? what are strong and weak points? Do you have suggestions for improvements of the process?
- Are there suggestions for other employees who have explicit perceptions regarding innovation processes within The Residence?

*Work-floor supervisors, middle-managers, HR-managers, and innovation managers*

**Introduction**

- Informal and personal introduction
- Introduction of the research, case study, compliance and anonymity, and the process.
- How would you describe your function/job at The Residence?

**Innovation and process**

- What is the role of innovation within The Residence? What are the possibilities for employees to participate in innovation practices?
- How often do you or your team think of possibilities for the organization to renew? What examples can you give of such ideas?
- To what extent are (your) employees involved in innovation processes?
- What reasons are there for employees to not be involved in innovation processes?
- Can you explain which steps the innovation process consists of when an employee has an idea? How different are these steps dependent on the content of the innovative idea?
- When in the innovation process do employees need to interact with supervisors?
- To which extent is it clear for employees what they need to do when they have an idea or are involved in innovation processes?
- How do you describe the freedom for employees to come up with ideas and bringing them forward?

**Support** (if applicable: questions are related to the mentioned innovation example)

- What are the most important aspects that stimulate(d) the innovation process?
- What are the most important aspects that hold/held back the innovation process?
- Which instruments do you use to stimulate employees to come up with innovative ideas?
- Which instruments do you use to stimulate involvement to be involved during the implementation of innovations?
- How are these instruments deployed in the different phases of the innovation process?
- To what extent can work-floor employees contribute to innovation processes?
- Which instruments do you use to help employees develop their capabilities and abilities to better be able to suggest ideas and help developing innovations?
- How motivated are work-floor employees to contribute to innovation processes?
- Which instruments do you use to motivate work-floor employees to suggest innovative ideas and being involved in innovation processes?
- Which instruments do you use to give work-floor employees the opportunity to generate innovative ideas or to engage in innovative processes?
- What opportunities are given by the organization to stimulate innovative behavior?

**Closing**

- How would you evaluate the current innovation performance? what are strong and weak points? Do you have suggestions for improvements of the process?
- Are there suggestions for other employees who have explicit perceptions regarding innovation processes within The Residence?

## Interview protocols The Residence (Dutch)

*Werkvloer medewerker*

**Introductie**

- Informele- en persoonlijke introductie
- Introductie van het onderzoek, casus, vertrouwelijkheid en anonimiteit, en het interview
- Hoe zou u uw functie/taak/werk bij The Residence omschrijven

**Innovatie en proces**

- Welke rol speelt 'innovatie' bij The Residence? Wat zijn de mogelijkheden voor medewerkers om deel te nemen aan innovatie werkzaamheden?
- Hoe vaak denkt u aan mogelijkheden voor het verbeteren/vernieuwen van de organisatie? Welke voorbeelden kunt u geven van dergelijke ideeën?
- Bent u (wel eens) betrokken (geweest) bij innovatieprocessen? Zo niet, zou u dit graag willen? Zo niet, welke redenen kunt u geven om niet betrokken te willen zijn? Welke voorbeelden kunt u geven van innovatieprocessen?
- Kunt u uitleggen welke stappen het innovatieproces inhoudt wanneer u een idee zou aandragen? Hoe verschillend worden deze stappen doorlopen naarmate de inhoud van het innovatieve idee anders is?
- Wanneer in het innovatieproces vindt er interactie plaats tussen u en collega's/leidinggevenden?
- In welke mate is het duidelijk waar u met een innovatief idee terecht kunt of wat u moet doen als u betrokken bent bij een innovatieproces?
- Hoe zou u de mate van vrijheid omschrijven om met ideeën te komen en deze verder de organisatie in te brengen?

**Support** (indien toepasbaar: vragen zijn gerelateerd aan de eerdergenoemde voorbeelden)

- Wat zijn de belangrijkste aspecten die innovatieprocessen stimuleren/stimuleerde?
- Wat zijn de belangrijkste aspecten die innovatieprocessen tegenhouden/hebben gehouden?
- Welke instrumenten gebruikt de organisatie om medewerkers te stimuleren om innovatieve ideeën aan te laten dragen?
- Welke instrumenten gebruikt de organisatie om medewerkers te stimuleren om betrokken te zijn tijdens de implementatie van innovaties?
- In welke mate ziet u uzelf als capabel en vaardig om bij te dragen in innovatieprocessen?
- Hoe stimuleert de organisatie u om uw vaardigheden te ontwikkelen zodat u beter in staat bent of ideeën aan te dragen en bij te dragen aan innovaties?
- In welke mate ziet u uzelf gemotiveerd om bij te dragen aan innovatieprocessen?
- Hoe motiveert de organisatie u om innovatieve ideeën aan te dragen en betrokken te zijn in innovatieprocessen?
- Welke gelegenheden/mogelijkheden worden er door de organisatie gegeven aan de medewerkers om ideeën aan te dragen en betrokken te zijn bij innovatieprocessen?
- Wat heeft u nodig om met (meer) ideeën te komen of om meer betrokken te zijn bij innovatieprocessen?

**Slot**

- Hoe zou u het huidige innovatieresultaat evalueren? Wat zijn sterke en zwakke punten? Heeft u suggesties ter verbetering van het innovatieproces?
- Heeft u nog suggesties voor andere medewerkers die een expliciet beeld hebben met betrekking tot innovatieprocessen binnen The Residence?

*Work-floor supervisors, middle-managers, HR-managers, and innovation managers*

**Introductie**

- Informele- en persoonlijke introductie
- Introductie van het onderzoek, casus, vertrouwelijkheid en anonimiteit, en het interview
- Hoe zou u uw functie/taak/werk bij The Residence omschrijven

**Innovatie en proces**

- Welke rol speelt 'innovatie' bij The Residence? Wat zijn de mogelijkheden voor medewerkers om deel te nemen aan innovatie werkzaamheden?
- Hoe vaak denkt u of uw team aan mogelijkheden voor het verbeteren/vernieuwen van de organisatie? Welke voorbeelden kunt u geven van dergelijke ideeën en innovaties die daaruit zijn voortgekomen?
- In welke mate zijn (uw) medewerkers betrokken bij innovatieprocessen?
- Welke redenen zijn er voor medewerkers om niet betrokken te zijn bij innovatieprocessen?
- Kunt u uitleggen welke stappen het innovatieproces inhoudt wanneer een medewerker een idee zou aandragen? Hoe verschillend worden deze stappen doorlopen naarmate de inhoud van het innovatieve idee anders is?
- Wanneer in het innovatieproces vindt er interactie plaats tussen medewerkers en hun leidinggevende?
- In welke mate is het duidelijk voor een medewerker waar hij/zij met een innovatief idee terecht kan of wat hij/zij moet doen als ze betrokken zijn bij een innovatieproces?
- Hoe zou u de mate van vrijheid omschrijven voor medewerkers om met ideeën te komen en deze verder de organisatie in te brengen?

**Support** (indien toepasbaar: vragen zijn gerelateerd aan de eerdergenoemde voorbeelden)

- Wat zijn de belangrijkste aspecten die innovatieprocessen stimuleren/stimuleerde?
- Wat zijn de belangrijkste aspecten die innovatieprocessen tegenhouden/hebben gehouden?
- Welke instrumenten gebruikt u om medewerkers te stimuleren met innovatieve ideeën te komen?
- Welke instrumenten gebruikt u om medewerkers te stimuleren om betrokken te zijn tijdens de implementatie van innovaties?
- Hoe worden deze instrumenten ingezet in de verschillende fases van een innovatieproces?
- In welke mate kunnen werkvloer medewerkers bijdragen aan innovatieprocessen?
- Welke instrumenten gebruikt u om werkvloer medewerkers te ontwikkelen met vaardigheden om beter in staat te zijn om kwalitatieve ideeën aan te dragen en deze ideeën te helpen implementeren?
- Hoe gemotiveerd zijn werkvloer medewerkers om bij te dragen aan innovatieprocessen?
- Welke instrumenten gebruikt u om werkvloer medewerkers te motiveren om innovatieve ideeën aan te dragen en te betrekken in innovatieprocessen?
- Welke instrumenten gebruikt u om werkvloer medewerkers gelegenheid/mogelijkheid te bieden om met innovatieve ideeën te komen of deel te nemen aan innovatieprocessen?
- Welke mogelijkheden biedt de organisatie om innovatief gedrag te stimuleren?

**Slot**

- Hoe zou u het huidige innovatieresultaat evalueren? Wat zijn sterke en zwakke punten? Heeft u suggesties ter verbetering van het innovatieproces?
- Heeft u nog suggesties voor andere medewerkers die een expliciet beeld hebben met betrekking tot innovatieprocessen binnen The Residence?

## Appendix B: EDI route overview