Lappeenranta-Lahti University of Technology LUT

School of Engineering Science

Industrial Engineering and Management

Global Management of Innovation and Technology

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INTEGRATED FRAMEWORK FOR THE IDEA IMPLEMENTATION STAGE OF INNOVATION PROCESS ON AN INDIVIDUAL LEVEL

Master's Thesis

Examiner(s): Daria Podmetina, D.Sc. (Tech.)

Marko Torkkeli, Professor D.Sc. (Tech.)

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ABSTRACT

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Although only implemented creative idea represents value for the organization and becomes an innovation, there is surprisingly little knowledge on the factors facilitating the implementation of innovations, particularly on an individual level. This study attempts to close this gap by developing an integrated framework for the idea implementation stage of the innovation process on an individual level. The research is qualitative and exploratory in nature and is based on two methods: (1) structured literature review conducted for deriving the framework and (2) validation by the expert panel of innovation professionals in academia from eight countries. The completed framework consists of 18 individual-level factors spread across four categories (Expertise, Motivation, Social skills and Personality traits) and can be used for the development of tools and methods for HR and managerial practices aiming at the improvement of the effectiveness of innovation implementation in organizations.

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Special thanks go to my family who helped me to get a golden opportunity to study here in Finland, and Teppo who constantly supported me, cheered with me for every small victory and always stood by my side.

Alena

Lappeenranta, November 2020

Great idea without implementation remains what it is – an idea.

Theodore Levitt

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1 INTRODUCTION

1.1 Background

Innovation is a buzz word of the 21st century. Not only it is vital for economic, technological, and societal development but also essential for the overall progress of humanity. Innovation is inherent in all spheres of human life because without innovation there is stagnation and eminent endpoint for any process or phenomenon (Kharchenko, *et al.* 2020).

The particular importance of innovation is recognized in an organizational context (Viima, 2019). From the micro perspective, innovation ensures that the organization stays relevant and competitive, while from the macro perspective, innovation contributes to overall economic growth and social progress through meeting various societal needs.

Since late 50s, organizational innovation research has been mostly focusing on the idea generation part of the innovation process (Amabile, 1988a; Sternberg and Lubart, 1996; Jong, 2007) that resulted in many studies about how to foster creativity in organizations and what traits are indicative of creative potential in the individuals. However, idea generation is not the only one important prerequisite for organizational innovation. Moreover, if the company only focuses on the generation of creative ideas, it can be bogged down into numerous “creativity workshops” and continuous talks about abstract ideas without making any practical progress (Levitt, 2002).

Even great ideas are worthless for the business if the practical implementation of these ideas fails to occur (Choi and Chang, 2009). During the implementation, innovation obtains its final form, in which it can actually generate value and be useful.

However, the process of implementation is much more complex and challenging than it is commonly assumed. This is the stage where most of the innovation failures take place (Cozijnsen, Vrakking and van IJzerloo, 2000). Baer and Frese (2003) report that approximately 50% of technological and administrative innovations flop exactly during their implementation. Alexander and Hearld (2011) reveal even more dramatic numbers. According to them, in the healthcare sector, 30% to 90% of complex innovations (depending on what is considered as failure) fail on the implementation stage.

If the implementation is blundered, it is not only time and effort that goes wasted. A substantial share of investments that are poured by the companies into their innovation effort can get lost too. It is particularly painful if the ideas that cost a lot of money to generate fail during their implementation. In this case, it is more reasonable for the company not to spend any resources on generating creative ideas at all (Skerlavaj *et al.*, 2017).

Considering the importance of the implementation process for innovation success, there is surprisingly little research done in order to define what factors facilitate the implementation of innovation. It happened because implementation as a process has often been overlooked by researchers and by managers. It has been considered as trivial activity routinely following a more important and intricate process of idea generation (Rogers, 1995; Axtell *et al*., 2000). As a result, many innovation studies tended to either disregard idea implementation stage in the innovation process altogether (e.g. Unsworth, 1999) or collapse both idea generation and idea implementation into one continuous process (e.g. Hammond *et al*., 2011), which undermined understanding of what factors influence which stage (Axtell *et al.,* 2000; Magadley and Birdi, 2012).

It is established in the literature that innovation is originated from individual creativity and driven by the effort of people (Skerlavaj *et al.,* 2017). However, knowledge on what makes a successful innovator, particularly on the implementation stage, is still scarce and fragmentary. Different sources report different factors (e.g. Patterson, Kerrin and Gatto-Roissard, 2009; Birdi, Leach and Magadley, 2016), however the question remains open: what factors are indicative of the individual with high innovation potential who can successfully handle a complex process of innovation implementation?

Although it was established that idea generation and idea implementation stages are influenced by different factors (Axtell *et al.,* 2000; Birdi, 2007), due to mentioned limitations concerning implementation literature sources, there is little research on the factors facilitating idea implementation (Magadley and Birdi, 2012). But as it is the implementation that brings an innovative idea to life, it is important to know what factors facilitate this process, both for bringing more clarity to the implementation theory and for improving the success rate of the implementation process in organizations (Axtell *et al.,* 2000).

This research puts together fragmented knowledge on the individual-level factors facilitating innovation implementation and develop a framework for the implementation stage of the innovation process using a two-stage qualitative method encompassing structured-literature review and expert validation.

1.2 Aim and research question

A creative idea generates value for a company only when it is implemented properly (Choi and Chang, 2009; Magadley and Birdi, 2012). However, the factors pertaining to innovative individuals that promote and facilitate innovation implementation are still lacking proper research and categorization (Amabile, 1996; Choi and Price, 2005; Anderson *et al.,* 2014).

Due to the nascent nature of research, understanding of idea implementation concept is quite vague. In the literature, the term is often used interchangeably with other concepts such as innovation adoption (Klein and Knight, 2005). Also, there is little agreement on what activities the implementation stage includes (Hammond *et al.,* 2011; Sternberg, 2006; Perry-Smith and Mannucci, 2017) or what contributes to the success of implementation, particularly on the individual level (Choi and Price, 2005). In order to eliminate confusion and shed more light on the factors promoting innovation on the implementation stage, more research is necessary as claimed by implementation researchers (Baer, 2012; Anderson, Potocnik and Zhou, 2014).

First, this study brings clarity in the understanding of idea implementation and derives a definition that will best reflect important aspects of the implementation process. Second, the search and categorization of the individual factors explicitly attributed to the idea implementation stage will be conducted.

As revealed in the analyzed literature, information on these factors is fragmented and incomplete (Patterson, Kerrin and Gatto-Roissard, 2009; Anderson, Potocnik and Zhou, 2014; Birdi, Leach and Magadley, 2016). A framework containing clear categorization of knowledge and skills is needed in order to facilitate the identification of innovative individuals and promote the implementation of innovative ideas in organizations.

Accordingly, the following research questions (RQ) have been formulated:

RQ1: What are the factors promoting innovation on the idea implementation stage of innovation process on an individual level?

RQ2: What is the most appropriate approach to their categorization?

In order to answer the following questions, two methods have been employed:

1. Structured literature review in order to derive an Integrated Framework for the idea implementation stage of innovation process on the individual level (IFII), which includes identification of individual-level factors and formulation of the principle for their categorization, and
2. Framework's expert validation in order to established consistency and reliability of the newly developed Framework.

As it follows from the research method, data is going to be derived from the literature, both for the identification of factors and for development of the method for their categorization.

1.3 Delimitations

The present study is conducted on the individual level of analysis because the aim is to research individual-level factors that are indicative of implementation success, so the organizational and team factors and their influence are not considered in the scope of this study. Also, in previous research, the difference between idea generation and idea implementation stages has not been articulated well enough, which hindered the identification of factors pertaining to the implementation stage (Magadley and Birdi, 2012). In this study, this difference is emphasized and brought out. Thus, only factors that are explicitly attributed by the authors to the implementation stage are considered worthy of investigation, while factors belonging to idea generation stage or spread by the author across the whole innovation process have been disregarded.

Due to the nascent nature of implementation research, this study assumes qualitative approach, so the detailed quantitative assessment of each individual-level factor has not been made, except the relevance and importance measure of each factor to the overarching framework. The weight of each factor and their interconnectedness fall outside of the scope of the present study. On the one hand, it reduces actionability of the research results, but on the other hand, the research aims to provide new insights on why these factors are indicative of the individual with good innovation implementation capabilities, which is valuable not only for emerging implementation research but also can become the basis for the development of the tools for innovation potential assessment and techniques for facilitating innovation implementation in organizations. Operationalization of the Framework can be a subject for future research.

1.4 Structure of studies

Chapter 1 starts with introducing the subject of this study, namely idea implementation, and why it is important. It continues with the introduction of the research aim and research question and outlining the delimitations of the study. Chapter 2 develops a solid theoretical framework that will lay the base for the development of the Framework. Chapter 3 focuses on the methodology, particularly on research design and research methods employed in this study. In Chapter 4, the developed Framework and its elements are presented, while Chapter 5 elaborates on the research findings obtained during the structured literature review and discusses the results of expert validation. Chapter 6 rounds up the discussion of the research results. Chapter 7 draws the conclusion to the study as well as provides theoretical and practical implications of the study and outlines the avenues for future research.

2 THEORETICAL FRAMEWORK

This chapter covers the theoretical aspects of the study, which is crucial for building a solid background for the Framework development. An integrative literature review aiming at synthesizing the knowledge on research topic is conducted as a descriptive summary of existing knowledge in a top-down way (Snyder, 2019). Thus, it builds a theoretical background starting from an overview of general concepts and gradually descending to underlying concepts, which are then explored in more detail. This approach allows to see a bigger picture before breaking it down to base elements and is suitable for studying new or ill-defined concepts (Strawson, 1992).

First, the chapter explores the concepts of innovation and innovation process as a starting point for the research. Next, a choice of level of analysis employed in the study is explained and corroborated by the section about pervading role of individual in the innovation process. Lastly, idea generation and idea implementation are explored separately to set a stage for the next part of the study devoted to identification of the individual factors that promote innovation on the idea implementation stage.

2.1 Innovation

According to Godin (2015), the word innovation ascends to the 13th century where it was first found in law documents related to the renewal of contracts. Interestingly, it was not used as a term for creation but was rather an epithet for newness or change. Innovation began to develop a connection with science and industry only by the time of the Industrial Revolution. It mostly referred to the technical invention, until in 1939 Joseph Schumpeter drew the line between invention and innovation. According to Schumpeter (1939), the invention is a culmination of creative and intellectual activity, a novel combination of prior knowledge, ideas, and available resources, that is only economically beneficial once put into use, while innovation has to do with the firm's ability to adopt and capitalize on these inventions to constructively change their business model. Still, until modern time terms, innovation and technical invention were perceived as very similar and sometimes used interchangeably in the non-scientific community.

In the 20th century, innovation as a concept found its way into economic and social sciences as a synonym to technological, social, or cultural change and later entered the field of management where it began to associate with such concepts as efficiency, productivity, organizational structure and management style, among others. The term innovation became

more manifold and started to shift from being mainly associated with the technological performance of a firm.

It can be illustrated on the graph generated by Google Books Ngram Viewer (Fig.1). Google Ngram Viewer shows how often the word is appearing in the literature over selected period of time, which can indicate how much interest was paid to the concept defined by this word.

Figure 1 shows that in the beginning of 2000s there is a simultaneous decline in frequency of the terms R&D and patent, which are directly related to technological invention, while frequency of the term innovation keeps increasing steadily.

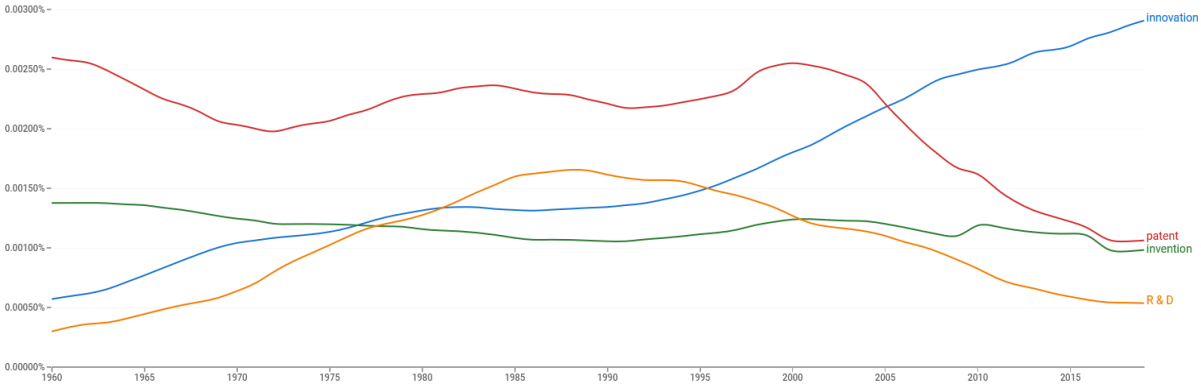


Figure 1. Dynamic of popularity of the words innovation, invention, patent, and R&D from 1960 to 2019 (Google Books Ngram Viewer, 2020)

It indicates that at the beginning of a new century innovation progressed past technological sphere to less tangible areas, such as business, management, social sciences, and economics (Fig. 2).

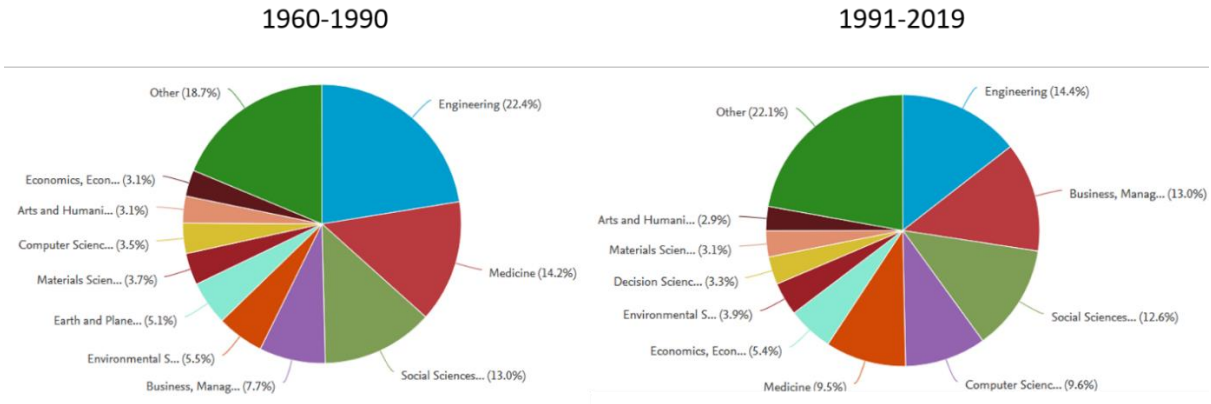


Figure 2. Transition of the term innovation across different subject areas over time (Scopus, 2020)

Figure 2 shows occurrence of the term innovation in literature across different research fields over two time periods: 1960-1990 (left) and 1991-2019 (right). Time periods were chosen to better illustrate the change in frequency of the term occurrence in the same research field. The analysed body of scientific literature was obtained in Scopus database and included 418 635 documents (mostly scientific articles and conference papers) arranged by the subject areas. In each article, innovation was somehow mentioned. Analysis according to time periods and subject areas was conducted automatically by the Scopus analytical system.

Figure 2 indicates the decline in the use of the term in such technology-related fields as engineering, medicine, and material sciences. At the same time, the term innovation gets more widely used in business and management, computer science (digitalization makes its impact), and economics.

This transition illustrates an important step in the evolution of innovation when innovation spread to non-technological areas. It happened due to the increasing complexity of social, economic, and business structures and their failure to meet social demand (Agostini *et al.,* 2017). It is no longer enough to see innovation solely as an attribute of technological progress or commercial activity. New norms and structures require the introduction of non-technological (or combined) methods of value creation or rather the values themselves have changed. The rise of new areas of importance for humanity lying beyond technological progress, such as demand for stronger social institutions, environmental protection, justice and non-discrimination, stimulated innovation to become a more complex concept and spread to new dimensions.

First, innovation made a big leap in the management and business domain. As it has already been mentioned, initially innovation was associated with the application of new technological process and the development of new product and viewed predominantly as technological innovation. Over time, however, this view received criticism for not including the whole range of the firm's innovative activities such as a change in the business model or external relations.

In 2005, OECD proposed a non-technological view on innovation and introduced the concepts of organizational and marketing innovation in addition to product and process innovation. In contrast with technological innovation characterized by developing new technological invention or knowledge, the non-technological innovation did not necessarily include any technological change but was mostly concerned with the development and adoption of new business methods or concepts enabling a change in organizational structure or business activities improving the performance of the firm. Specifically, OECD (2005) defined that a marketing innovation concerns the change in how the product is presented to a customer, promoted and priced, while an organizational innovation concerns the enhancement of

business practices and organizational processes. Although technological and non-technological innovations often overlap (e.g. marketing innovation can be based on product innovation), some researchers agree that the share of non-technological innovations prevails. For example, according to Schmidt and Rammer (2007) conducting their survey across many industries in Germany in 2002-2004, the number of companies with only technical innovations was significantly lower than the number of companies with only non-technological innovations. Over time, innovation scholars agreed to unite all profit-seeking innovations happening in the firm under the overarching term business innovation (Pol and Ville, 2009).

The second expansion happened at the end of the 20th century in social sciences as a result of an evolving understanding of how people benefit from innovation. Scholars began to pay attention to how an impact made by business innovations expands beyond business and economic dimensions into society. Kuznets (1974) started to distinguish the non-economic impact of technological innovation. He posited that new technology may require new institutional structures and processes, which implies legal and social change. It was one of the early contributions to the development of the social innovation concept in the scientific literature. The second half of the 20th century was marked by the increasingly complex social systems and a growing concern of people about such topics as climate change, environmental protection, quality education, and social justice, among others. As Pol and Ville (2009) postulated in their extensive study of social innovation, these areas require change that cannot be ensured by business innovation alone.

As a term, social innovation refers to a generation of new ideas that improve the living conditions of people. It includes quality of life (living standards) and/or quantity of life (life expectancy) (Young Foundation, 2007). Social innovation aims at the creation of better tomorrow through the change in social institutions and people's minds in order to mitigate existing social, cultural, or environmental challenges (Pol and Ville, 2009). Therefore, in contrast with business innovation social innovation does not pursue monetary gain, although it can be a by-product. Instead, its main priority is the wellbeing of humankind and the planet in general. One of the brightest examples of social innovation can be an independence movement of Mahatma Gandhi in India of the 1920s, the innovation bringing 565 princely states overpowered under British tutelage to one independent country that nowadays has the 4th biggest economy in the world (Forbes, 2019).

Third, in last 40 years, innovation scholars began to discern the concept of innovation in the context of service economy, which broadened the perspective on innovation even further. Service innovation is an important driver of economic growth as the services are a dominant pillar in the economies of most countries. Globally, the share of services in the global gross

domestic product is steadily more than twice as high as the share of industry (Statista, 2020) (Fig. 3).

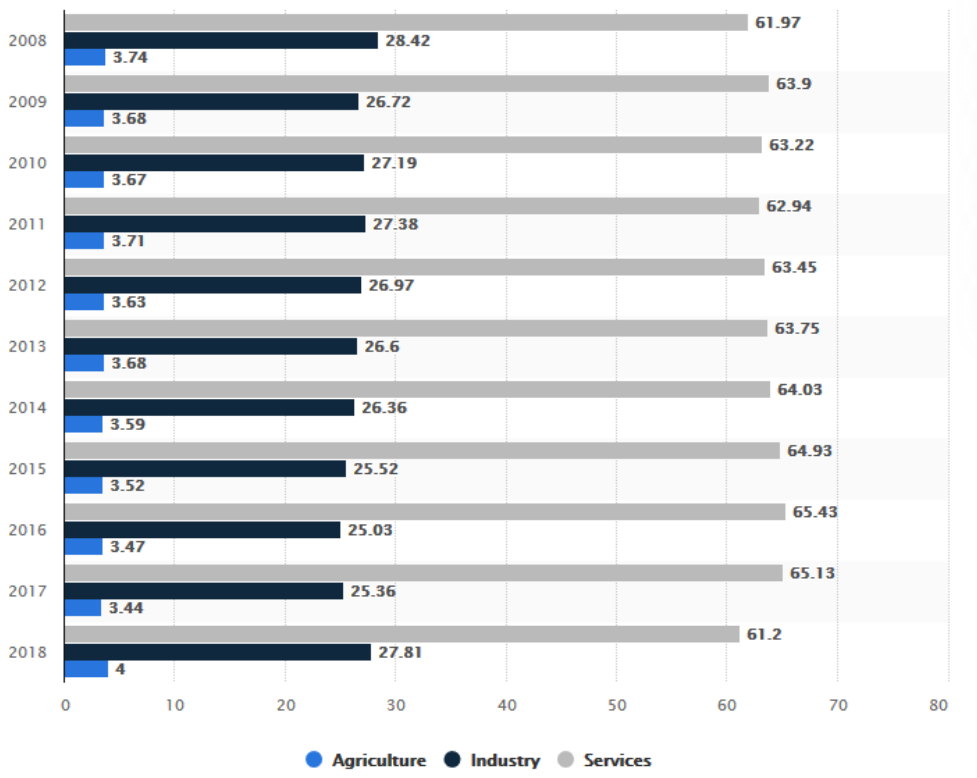


Figure 3. Share of economic sectors in GDP from 2008 to 2018 (Statista, 2020)

Services are omnipresent in most sectors that deal with clients (financial, hospitality, transportation, IT, etc.). Services are very often information-based and deploy information technologies, which partly explains the boost of the term use in Computer Science literature (Fig. 2).

According to Toivonen and Tuominen (2009), service innovation is not easily detectable as the service is more complex than product or process and actually appears to be a combination of the two. As services are characterized by a significant involvement of the customer who often consumes the service almost immediately after it is produced, the presence of innovation in services gets even harder to detect. Rather, it can be seen in the result of services provided, e.g. in customer satisfaction.

A more complex nature of the innovation environment in the case of services, which involves constant interactions between many service stakeholders, makes the process of innovation more intricate, dynamic, and not always deliberate. In addition, as the service innovator has to draw from tacit knowledge it is challenging to make the process of service innovation as

formalized and straightforward as the process of technological innovation. Service innovation is often so tightly interwoven with the process of a business or product development that it gets confused with technological or business innovation. In order to keep service innovation high in the company, it is important to not only constantly improve a product, process, business activities, or service delivery but also follow rapidly changing consumer trends such as individualization, feminization, and cultural diversity. Thus, innovation in services is characterized by a strong focus on customer satisfaction and reliance not only on other kinds of innovation (technological, business, and social) but also an interaction between them (Bouwman *et al*., 2008).

Innovation is not limited to the three above-mentioned domains. They were chosen as the most prominent and illustrative examples to showcase how, over time, innovation as a term went a long way from being understood as merely a development of a new technological device to a complex concept incorporating technological, economic, social, cultural, and business dimensions. An object of innovation transitioned from tangible and concrete to intangible and dispersed. Innovation can be found in all spheres of our life; it is something that moves the world forward (Kharchenko *et al.,* 2020). The absence of innovation means stagnation, which ultimately leads to the failure of the actor (company, industry, project, individual in a professional sense, etc.), outperformed by more innovative and faster-developing competitors.

It was said previously in the text that innovation has been spreading to different domains over time. However, it is more accurate to say that innovation was initially present and insured the development of the domain, and only at some point of time became more visible and increasingly recognized by the scientific community.

Apart from different domains, understanding of innovation alters among at least five different dimensions too (Eveleens, 2010). Among those dimensions are:

1. Innovation type. Different authors view innovation as a product or as a process (Gupta *et al.,* 2007). This distinction stems from Schumpeter's study on innovation who distinguished product – a new product or enhanced quality of the product, and process – a new production method (Archibugi *et al.,* 1994). Some authors such as Eveleens (2010) also distinguish service innovation while others (e.g. Walker, 2006; Gupta, 2018) consider service innovation to be a special case of product innovation. At the same time, type in line with product and process innovation, Walker (2006) names ancillary innovation distinguishable from them in a way that ancillary innovation often depends on the factors outside the organization's control, such as public engagement and governmental support. Ancillary innovations take place in public and governmental

sectors and can take the forms of community service programmes and supplementary educational programmes for adults (Walker, 2006).

2. Degree of novelty. Most of the authors distinguish incremental and radical innovation. Incremental innovation consists of minor changes that are not prominent enough to attract headlines but nevertheless important for continuing improvement of products or processes and tailoring them to the individual or local needs (Mulgan and Albury, 2003). This is the most common type of innovation that if properly implemented allows to overrun competitors. Radical innovation happens less frequently. They introduce fundamentally new ways of production, organization, or service delivery (Mulgan and Albury, 2003). In addition, Mulgan and Albury (2003) distinguish systemic or transformative innovation, which happens with the emergence of new technologies and transforms the whole sectors and industries, usually over a long period of time. Besides, innovations can be continuous or discontinuous (Bessant, 2005) as well as disruptive or sustaining (Christensen *et al.,* 2015).
3. Type of organization. It is suggested by research that innovation management in private companies is different from innovation management in public organizations (Eveleens, 2010; Hartley, 2013).
4. Size of organization. It is suggested also that innovation is happening differently in large and small organizations (Damanpour, 1992; Eveleens, 2010).
5. Environment. Innovation proceeds differently if it takes place in stable environment as opposed to turbulent environment characterised by a high degree of uncertainty, which makes an impact on the implementation routines (Hansen and Birkinshaw, 2007; Eveleens, 2010).

Considering this variety, there is no one-fit-all definition of innovation. Accordingly, Damanpour and Schneider (2006) recognize that innovation is such a multidisciplinary topic and it is viewed from multiple perspectives. In 2013, Edison et al identified 41 existing definitions of innovation based on the comprehensive literature analysis. Most definitions are formulated around the development of a new product, process, or service, which results in profit generation and/or performance enhancement. Some omit the practical outcome of innovation and define innovation as a formulation of “a new idea, formula or unique approach” (Van de Ven, 1986, Gupta *et al.,* 2007), which, to my understanding, lacks an imperative of usefulness and application postulated by Schumpeter.

The present study aims to entertain a person-centric approach to innovation as a process of the practical application of creative ideas by humans. Therefore, the definition of innovation should include a “practical application” part (in line with Schumpeter), view innovation as a process (as stages of this process are in focus) and be not specific to the domain. In addition,

as the present study aims to be of use for organizations and particularly for HR and managers, the definition should as well encompass organizational perspective.

For this purpose, the definition of Baregheh, Rowley and Sambrook (2009) has been adopted and adapted using a person-centric approach. So accordingly, in this study, innovation is defined as “the multi-stage process whereby individuals in organizations transform ideas into new/improved products, service or processes, so organizations can advance, compete and differentiate themselves successfully in their marketplace” (p.1334). The authors specifically developed this new definition in order to eliminate all discrepancies and limitations that were present in many previous definitions of innovation and in order to introduce a multidisciplinary definition for a concept encompassing so many disciplines.

This definition is selected because it includes (1) the notion of a multi-stage process often omitted by other scholars, (2) practical application in the form of products, services, or processes, (3) idea of change implied in innovation (“transform ideas”) and (4) presence of humans in the innovation process, which is required by the person-centric approach assumed in the present study.

In the next section, the level of analysis accepted in the study will be defined and discussed in order to narrow down the focus and narrative of the study.

2.2 Level of research analysis

The level of analysis refers to the settings and context where research is conducted. Generally, research is conducted on micro, meso or macro levels or can cut across different levels. Correct identification of the level of analysis and sticking to it throughout the research helps to avoid making wrong inferences e.g. by projecting properties of individuals on groups (Theodori, 2000).

Innovation is occurring on different levels starting from an invention made by an individual inventor (micro level) down to technological progress caused by this invention that makes an impact on industry and society (macro level). According to Sears and Baba (2011), micro level includes group and individual levels of analysis, while macro level encompasses societal/industry and organizational levels (Fig. 4).

Each level has been given a varying degree of scholarly attention according to the perceived importance of the related innovation outcomes. Most innovation scholars concentrate their effort on the organizational level as the most interesting from a lucrative perspective (Atkinson, 2013, Maier *et al.,* 2014). However, in the current study, it is argued that the individual level is

no less important because the individual is an origin and a major driver of the innovation process (Sears and Baba, 2011).

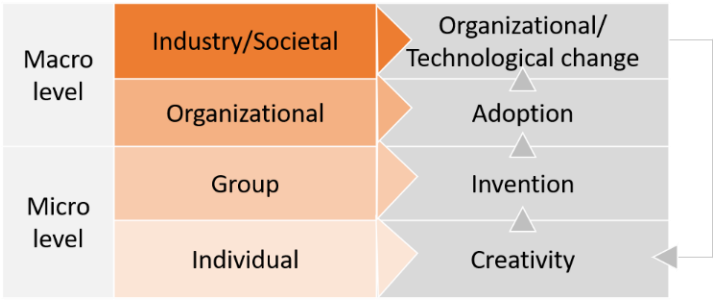


Figure 4. Multilevel model of innovation (adapted from Sears and Baba (2011))

Figure 4 illustrates an application of multilevel theory to innovation in order to provide a more comprehensive understanding of the innovation concept across four levels of analysis: individual, group, organizational, and industry/societal. The multilevel theory focuses on complex relationships between micro and macro levels in the organization (Klein *et al.,* 1999) in order to integrate different perspectives and eliminate fragmentation occurring when organizational research is conducted separately on different levels. Although multilevel theory originates from organizational sciences, it can be applicable in other disciplines such as sociology, management, and education.

As the model suggests, innovation starts on micro level where new ideas are generated by individuals. Micro level is therefore characterized by a focus on the role of individuals in the innovation process while the role of organizations and institutions receives less attention.

Individual-level research descends deep on an intricate level of an individual human being to understand the origins of innovativeness and creativity. Research on creativity makes a bulk in the body of knowledge on individual-level innovation led by such prominent researchers as Amabile (1988a, 1988b), Mumford and Gustafson (1988), and Sternberg (1999). Although many researchers speculate that creativity and innovation are somewhat close and even overlapping concepts, in the current study, the difference in these concepts will be explored in greater depth later in this section. Research on individual innovation encompasses such dimensions as individual characteristics (personality, education, experience, and motivation), job factors describing the job to be done, and contextual factors describing external influences (Hammond *et al.,* 2011). According to the Multilevel model, the main output on the individual level is creativity or rather new ideas produced by the individual, which is viewed as a starting point of the innovation process (idea generation stage).

Group-level research is focusing on relationships within the group and the environment around the group defining the success or failure of the innovation process (Hargadon and Bechky, 2006). Group innovation is influenced not only by organizational factors but also by group-level factors, such as internal communication, group cohesion, common vision, and task orientation (Hülsheger *et al.,* 2009). Group-level research on innovation explains how new ideas generated by individuals are processed within the group and developed into an invention, which Damanpour (2002) defines as a "practical manifestation of creativity". According to the Multilevel model, the invention as an innovation outcome on a group level bridges the idea generation stage with an adaptation stage of the innovation process, which is taking place on the organizational level of analysis (macro level).

Macro level of analysis encompasses innovation research on industry/societal and organizational levels. According to Sears and Baba (2011), macro level is characterized by the prevalence of impersonal analysis as it emphasizes the role of institutions and organizations in the innovation process over the role of individuals.

Organizational-level research on innovation received ample attention from innovation scholars (Lawson and Samson, 2001; Tuominen and Hyvönen, 2004, among others). It comprehends internal and external factors influencing innovation in the firm, such as the firm's vision and strategy, competence base, organizational intelligence and knowledge management, organizational structure, culture and climate, external relations and networks, and an ability to manage the innovation process. On the organizational level, an individual's role in the innovation process is downplayed and the organization as a system steps forward. On this level, innovation outcome takes a form of implementation of the invention created on a group level, which results in organizational and/or technological change. It is prompting the competitiveness of the firm within its sphere of influence.

The technological change brought on a higher level is called technological progress, which promotes the development of industries and society. The societal level of innovation research is mostly concerned with the development of policy frameworks and guidelines for fostering innovation on the national and regional levels. It includes such factors as motivation to provide institutional support of innovation in the industry, availability of human and technical resources, and prowess of institutions to govern innovation, e.g. in a form of government programs and private sector initiatives (Sears and Baba, 2011). Innovation on this level is driven by the adoption of the invention (i.e. innovation) or series of innovations happening on the organizational level as well as by the influence of local and global political and socio-economic situation and market demand. In turn, innovation-induced change in the societal landscape

entails the shaping of new societal norms. It makes an impact on individuals constituting the society, which brings us back to the individual level (Fig.4).

Although the macro level of analysis is less concerned with individuals, their role is still instrumental as both organization and society consist of people. Multilevel theory in the interpretation of Sears and Baba (2011) emphasizes the role of individuals across all levels of analysis in innovation research subsequently making an individual the source and agent of innovation. It is an important notion. Many other innovation and creativity researchers, such as Amabile (1988a, 1988b) and Hammond et al. (2011), also place an individual in the centre of the innovation process as it starts with, conducted by, and ultimately made for the individual.

In line with the mentioned researchers, I assume a person-centric perspective on innovation (Baer, 2012) and claim that human agency is instrumental for driving innovation across all levels and on all stages. Therefore, in the current study, an individual level of analysis is accepted as it aligns the best with the research aim and research question. Accordingly, the next section elaborates on the place of the human in the innovation process.

2.3 Human aspects in innovation process

A propensity to innovation is innate in people. According to Steiner (1995) who based his opinion on Heidegger's philosophy of human nature, people are inclined to being unconventional and cooperative, and they are naturally drawn to tackling complex concepts in a practical way (look at the inquisitive nature of small kids), which fits well with the concept of innovation. According to Sears and Baba (2011), innovation is driven by the effort and energy of individuals while other factors such as creative climate, organizational structure and innovation-enabling policies are playing only a supportive role. Gajic et al. (2013) underline the importance of individual experience and unconventional interpretations throughout the whole process of innovation.

Individuals are present in all activities pertaining to the process of innovation. There is an extensive but not exhaustive list of such activities:

- Problem definition/reframing. Often the problem can be conceptualized in a way that inhibits or facilitates its resolving. Problem reframing can suggest a radically new perspective on the problem and thus become a source of new ideas. It can be illustrated by the example of Netflix, which business originally consisted in delivering DVDs by mail. After reframing the problem their business solved, Netflix founders found out that it was not the delivery of DVD discs but the delivery of movies, which

resulted in the innovative idea that changed the company's business model and brought Netflix to success (Fast Company, 2013).

- Information gathering. Information gathering is a part of knowledge management that is positively related to the innovativeness in organizations (Du Plessis, 2007). Information gathered by individuals contributes to the generation of new ideas, reduction of costs and risks associated with innovation, and creation of a knowledge base that can be harvested in the future.
- Information elaboration. Information is gathered from different sources and, in the case of a team, it is processed through the lenses of different people. It allows building upon diverse information sources, perspectives, and feedback, which leads to knowledge integration and expansion. This complex form of communication is beneficial for all participants as well as for the performance of diverse teams (Van Dijk *et al.,* 2018).
- Information sharing. Information sharing and exchange is a part of knowledge management. It contributes to skills and competency building and strengthens collaboration within the organization. It is particularly important in case of sharing a tacit knowledge that is not possible to access otherwise (Du Plessis, 2007).
- Strategizing. Innovation strategy is developed by individuals in order to draw a plan on how to reach their goals. It clarifies goals and aligns an effort of all stakeholders towards their achievement. Innovation strategy allows the company to leverage its resources and competencies with increased efficiency (Pisano, 2015).
- Championing. Championing is particularly important on the selection and design stages as it brings a creative idea to life by active promotion and obtaining necessary permissions, support and resources, which is particularly difficult in case of novel ideas that are deemed to be risky (Baer, 2012). Champions should have a certain degree of influence, competency and legitimacy in order to convince the decision-maker to render support and resources for the idea implementation (Perry-Smith and Mannucci, 2017).
- Problem solving. Innovators solve problems in a creative way. To solve a problem, one should consider the origins, nature and context of the problem, and then use obtained information to devise the solution. There are many methods of creative problem-solving, e.g. TRIZ, Six Thinking Hats, Delphi method, etc. Problem solving is a skill that can be taught and trained.
- Decision making. Innovation is a product of the right decisions made throughout the innovation process. According to De Oliveira et al. (2015), decision making is an extensively studied topic that aims to establish necessary procedures, criteria and methods in order to facilitate decision making and improve its efficiency. There are

many factors influencing the individual in the decision-making process: uncertainty, bias, emotions, etc.

Evidently, the role of the individual in the innovation process is significant. Although the abilities and amount of knowledge of a single individual are rather limited, every person has a unique experience gained through life. It shapes an original perspective, a lens, allowing to see things from a peculiar angle and combine pieces of knowledge that were not combined before, which is an essence of creativity.

It cannot be substituted by a machine-centred approach to innovation. Although information systems and databases, automatic idea generation, and machine learning are already available, they lack tacit knowledge and emotional experience peculiar to people. Machine innovation is still in its emerging state and aims to complement human's ideas, not to replace them (John, 2016). Although there is an established innovation process that can be and already is facilitated by machines and automation, human creativity, passion, and resourcefulness penetrating every step of the innovation process is too complex for machines to fully imitate it.

2.4 Innovation process

The innovation process describes the way a novel idea goes from inception to realization. It is essential for an organization's competitiveness to organize the innovation process in the most efficient way in order to increase the quality of innovation output and decrease innovation investments. Understanding of innovation process thus is an important step to better organize and manage it (Tidd, 2006).

Understanding of how innovation occurs has changed over time. According to Rothwell's five generations of innovation model (Rothwell, 1994):

First- and second-generation innovation models were linear and determined by "need pull" (market indicated a need for solution) or "technology push" (technological advancement found its way to the market).

Third-generation innovation model improved this understanding to a representation of the innovation process as several interdependent stages with a feedback loop to the previous stage and an established net of intra-organizational and external connections that brought the model of innovation process closer to reality.

Fourth-generation models were based on a parallel instead of sequential mode and emphasised the importance of resource integration around the project in order to utilise the

expertise of all necessary specialists, reduce development time, and a number of mistakes (Galanakis, 2006).

Fifth-generation innovation model underscores the need for continuous change, systems integration and networking with suppliers, customers and other organizations in order to improve information efficiency, support continuous communication and foster flexible and customised response (Galanakis, 2006).

The innovation process is usually graphically represented by the stage models containing a different number of stages according to the innovation field, context, and author's perspective. There are two views on the stage models: source-based and user-based (Klein and Sorra, 1996). The source-based stage model is founded in the perspective of the source or developer of innovation. It follows the innovation process from idea generation through design and prototyping to dissemination, the way as the developer sees it. The user-based stage model represents the path the user follows from awareness about innovation to final implementation and routinization. In this study, the source-based view is adopted.

Although a complex, iterative and dynamic nature of the innovation process is generally acknowledged, in academic literature, most approaches break the process of innovation into two key stages (Amabile, 1988a; Axtell *et al.,* 2000; Mumford *et al.,* 2002). For example, drawing on Ambidexterity Theory, Bledow et al. (2009) proposed that successful innovation in the organization is enabled by two fundamentally different activities: exploration (generation of new ideas, creation of new product) and exploitation (manufacturing or implementation activities). Howell and Boies (2004) view the innovation process as a sequence of two stages: first, an idea is generated, and second, an idea is evaluated, selected, promoted, and implemented. In line with them, Gupta (2018) suggests that innovation comprises two stages, namely generation, and adoption, where generation includes exploration of new ideas and use of existing resources in order to shape the idea while adoption refers to initiation and implementation that turn the idea into product or process. Baer (2012) in his study of individual innovation proposed that on the individual level the process of innovation consists of two activities: the development of new and useful ideas and their application in order to improve products and processes.

In most of the academic literature these two stages are referred to as idea generation stage and idea implementation stage accordingly (Fig. 5).

Figure 5. Model of innovation process on individual level (adapted from Anderson, Potocnik and Zhou (2014))

Although some researchers propose more elaborate innovation models, such as models, which apart from idea generation and implementation stages include idea elaboration and championing (Perry-Smith, 2014), idea evaluation (Mumford, 2002), and idea selection, developing and prototyping (Eveleens, 2010), most innovation researchers argue that those stages can be encompassed by either idea generation or idea implementation stage. For example, Hammond et al. (2011) include idea evaluation and selection in the implementation stage while Howell and Boies (2004) and Kokoulina et al. (2019) mention that the implementation stage is permeated by championing activities.

In the frame of this study, I decided to adopt a two-stage model (Fig. 5) for it is the most representative of the innovation process on the individual level. Figuratively this model delineates the most prominent innovative behaviours the individual exhibits on his or her way from idle ideation whereby the idea is born (idea generation) to the subsequent course of determined action aiming at bringing this idea to life (idea implementation). Skerlavaj et al. (2017) define these behaviours as exploration (idea generation stage) and exploitation (idea implementation stage).

While it is generally accepted that the innovation process consists of two distinctly different stages, the amount of knowledge on each stage is surprisingly uneven. While the idea generation stage and attributed to it concept of creativity have been studied thoroughly (Amabile, 1988a; Sternberg and Lubart, 1996; Jong, 2007, among others), idea implementation received far less scholarly attention. Magadley and Birdi (2012) assume that it happened because of a widespread bias in the scientific literature that idea implementation is a trivial activity routinely following a more important and sophisticated stage of idea creation. Apart from the lack of interest in this stage, many innovation researchers tend to either collapse two stages into one continuous process (Sternberg, 2006) or disregard the difference between stages when studying factors fostering innovation (Hammond *et al.,* 2011).

In the next chapters, each stage of the innovation process will be examined separately and in more detail in order to lay the basis for building an integrated framework, which is the main goal of this study.

2.5 Idea generation stage

The generation of ideas takes place in the creator's mind (Campbell, 1960). Accordingly, many researchers associate this stage with the concept of creativity (West, 2002; Baer, 2012; Perry-Smith, 2014). Research on creativity in its contemporary understanding took momentum at the beginning of the 20th century though some of the concepts and elements of creativity have been studied for hundreds of years well before that (Runco and Albert, 2010).

Creativity has many definitions. Most of them revolve around the notion of novelty that is in any way useful (Stein, 1967). Amabile (1988b), one of the most prominent creativity scholars, proposes the following definition: "creativity is the production of novel and useful ideas by an individual or small group of individuals working together" (p. 126). Indeed, creativity is more commonly studied on a micro level and particularly on the individual level (Sears and Baba, 2011) as a concept pertaining to individuals, though some researchers study creativity at the organizational level too (e.g. Woodman *et al.,* 1993).

Creativity culminates in the creation of a novel tangible (painting, sculpture) or intangible (idea, music, theory) item, which is completely new for the world (Anderson, Potocnik and Zhou, 2014). In some domains, such as arts and literature, the main demand to a creative idea is to be original, while in others, such as business, it is clearly not enough as a creative business idea should also be useful and feasible. It draws the line between artistic originality and creativity, two concepts that often get confused (Amabile, 1998).

Confusion also happens when the term creativity is mixed with the term innovation, which despite the ample research in this area still happens to date. Some scholars tie two concepts together (Gupta and Singhal, 1993; Adams, 2005) finding them to be similar and at times overlapping. However, many others argue that concepts though related in many ways are still not identical (Patterson, 2002; Hammond *et al.,* 2011; Anderson, Potocnik and Zhou, 2014). West (2002) and Baer (2012) posit that creativity and idea implementation are two steps of the innovation process, while Patterson, Kerrin and Gatto-Roissard (2009) point out that creativity refers only to the generation of new and original ideas whereas innovation is a broader concept that includes application of new ideas in order to make them useful in practice.

Some researchers see creativity as a complex of traits characterizing a person engaged in the creative process, some see it as a creative process itself, some see it as a product of this process, i.e. creative idea (Amabile, 1988a). In the current study, it is the most appropriate to view creativity as a personal characteristic, which contributes to a person's ability to innovate.

Although perceived as an abstract concept by many, individual creativity has a structure and composition. In the 1980s, Amabile proposed a componential theory of creativity, which broke individual creativity down into three components: knowledge, creativity skills, and motivation (internal components pertaining to the individual). Later, she developed the theory further and added the social environment as an external component. To this day, the Componential model of creativity proposed by Amabile (1988b) (Fig. 6) remains the most integrative general framework for the idea generation stage of the innovation process (Sears and Baba, 2011).

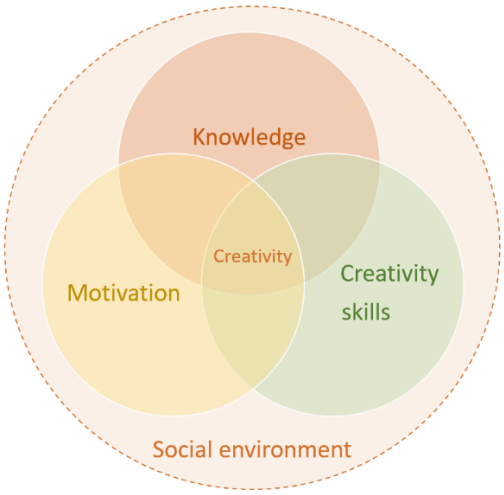


Figure 6. Componential model of creativity (adapted from Amabile (1988b))

As shown in Figure 6, creativity is a function of four components: three internal (knowledge, motivation and creativity skills) and one external (social environment). Internal components can be present in individuals at varying degrees, although all of them are necessary for creativity to happen:

- Knowledge is a compound of domain-relevant skills, technical skills, expertise, special talents, and intellectual ability (e.g. analytical thinking), which a person can use to solve the problem creatively. Figuratively speaking, it is a material base that the individual can draw from. The larger the set of cognitive trails that the individual can follow in order to find a solution for the problem the higher the number of alternatives or original solutions she can come up with. Though knowledge about the domain depends on cognitive ability, which is innate, it is also profoundly influenced by education, training, and work experience meaning that this component to a certain extent can be improved by training (Amabile, 1988b).
- Creativity skills component is a combination of certain personality traits and thinking styles, which defines how people approach and tackle the problem. The best combination for promoting individual creativity is proven to be cognitive flexibility (when

a person can draw the knowledge from seemingly unrelated knowledge domains and combine them in an unorthodox way) and a persistent work style (when a person is ready to ponder over a difficult problem and try to approach it from different directions) (Amabile, 1998). Creativity skills make for the tools or techniques that help the individual to make the most effective use of her material base (knowledge). Amabile (1988b) states that creativity-related skills can be taught and trained, which explains the subsequent abundance of research on creativity training programmes.

- Motivation component is by far the most important of all as it empowers the person to actually use her knowledge and creative skills that otherwise would stay untapped. In our example, motivation drives our individual to use her material base with help of efficient tools in order to produce a creative idea. Researchers distinguish between intrinsic and extrinsic motivation, a motivation that comes from within (the task is motivating by itself) and from external sources ("carrot or stick") respectively. In the Creativity model (Fig.6), Amabile and Pillemer (2012) proposed to use intrinsic motivation as it has a stronger positive effect on creativity than extrinsic motivation. Although the combination of the two can enhance individual creative output according to some researchers (Eisenberger, 1992), for the most part, extrinsic motivation is deemed to have a detrimental and constraining effect on individual creativity (Byron and Khazanchi, 2012).
- Social environment component is an external environment that surrounds the individual and has an influence on her aspirations, intentions, and internal norms. According to Amabile and Pillemer (2012), this influence is cast as follows: knowledge and creativity skills are the components that can be trained, taught, or acquired by experience, which is provided by the social environment, whereas the intrinsic motivation component sustains the biggest impact through everyday interaction of the individual with her social circles and external environment (e.g. supervision or reward system at work, emotional experiences, meaningful events, relationships, etc.).

According to Amabile (1996), creativity soars the highest when the individual's skills and knowledge coincide with his or her intrinsic motivation and when creativity components (all or some) have a higher degree of prominence.

Among personality traits pertaining to people marked by creativity, researchers name openness to experience, self-efficacy, perseverance, and extraversion (Furnham and Bachtiar, 2008; Prabhu *et al.,* 2008). In her work on the Model of creativity, Amabile (1988b) indicated good social skills and propensity to challenge the status quo as well as independence, self-discipline, risk orientation, and ambiguity tolerance though she mentions that traits per se are not as strong drivers of the individual creativity. Although the importance

of certain personality traits that are more conducive to creativity is postulated by numerous creativity researchers including such distinguished personality theorists as Freud, Jung, Maslow, and Rank, Amabile (1983) argues that these traits are not an essential prerequisite for creativity as an individual having required traits is still not creative in all domains and in all times, and even within a chosen domain, he or she may not be creative consistently. Amabile further suggests that the individual should have the motivation and relevant education in addition to the personality traits to succeed in producing creative work.

Creativity is measured by the creative performance of an individual, namely by the quality and quantity of his or her creative ideas. There are three indicators initially proposed by Guilford (1962): fluency (the number of non-redundant ideas), originality (uncommonness of the idea), and flexibility (use of different and even unrelated cognitive categories and their combinations). Later, there were added elaboration (how well the idea is developed) and effectiveness (viability of idea), though they do not appear in all creativity assessment tests.

Once several versatile, original, non-redundant ideas are concocted in the mind of a creative individual, there is the next stage where they should be developed into viable and practical solutions. Some researchers argue that implementation of an idea is a more difficult task than travail of creative ideation as it depends not only on the individual's own ability but also on decisions of other people and availability of resources (Axtell *et al.,* 2000; Howell and Boies, 2004).

2.6 Idea implementation stage

Although only implemented ideas represent value for the company (Magadley and Birdi, 2012), as mentioned before, the idea implementation stage received undeservedly little attention from innovation scholars. Yet, if idea generation requires substantial effort on the organizational part in order to empower employees and provide a suitable environment and creativity training, idea implementation is a way more challenging endeavour because apart from higher investments it bears higher risks associated with availability and efficiency of technology, resources and organizational support necessary to bring the idea from paper to practical use (Choi and Price, 2005; Skerlavaj, Cerne and Dysvik, 2014).

Not all ideas reach the implementation stage. Some highly creative ideas can disagree with reality (Li *et al.,* 2020) or meet strong resistance due to their uncommonness and perceived complexity (Baer, 2012). But even reaching the implementation stage does not promise much. 25% of 350 US CEOs participating in the Accenture-run survey admitted that their companies struggle to put an idea into practice and more than 60% referred to their innovation

implementation efficiency as merely satisfactory (Kambil, 2002). More than a decade later, another Accenture survey revealed that idea implementation is still lagging, majorly because the organizational environment is not fertile enough to nurture generated ideas, which causes losses in investment and competitiveness (Accenture, 2015). Deloitte (2019) in their Innovation in Europe report echoes that implementation of innovation in organizations keeps suffering due to a number of reasons such as lack of technical skills and inapt innovation culture, which hinders technology-driven innovation in Europe.

Organization-level factors that appeared in surveys as major obstacles to the implementation effort are mentioned for a reason. As opposed to idea generation mostly studied on the individual level implementation process is mainly viewed from an organizational perspective (Amabile, 1988a, 1988b; Choi and Price, 2005). According to Axtell et al (2000) and Birdi (2007), the implementation stage is influenced by macro-level factors to a greater extent than by individual factors as it is dependent on external resources, involvement, and support of other people.

Nevertheless, the theoretical importance of distinguishing an individual's influence on different stages of the innovation process has become increasingly recognized (Choi and Price, 2005; Baer, 2012; Anderson, Potocnik and Zhou, 2014). Though individual factors promoting idea generation are well-studied (Amabile, 1988a, 1988b; Taggar, 2002; Furnham and Bachtiar, 2008; Prabhu *et al.,* 2008), there is no evidence that the same factors will promote idea implementation (Magadley and Birdi, 2012). The other way round, it was established that factors promoting the generation of ideas, such as skills, knowledge, or personality traits, are clearly different from factors promoting idea implementation (Axtell *et al.,* 2000; Magadley and Birdi, 2012). And unfortunately, the knowledge about them remains sparse and fragmented.

It happens due to several reasons. First, most of the implementation research is made on an organizational level as implementation is generally viewed from an organizational perspective (Choi and Price, 2005).

Second, many individual innovation researchers prefer to focus their attention exclusively on the idea generation stage because they either take implementation for granted (Magadley and Birdi, 2012) or confuse implementation with such routine procedures as new equipment purchase (Real and Poole, 2005).

Third, many researchers still view innovation as a generic concept and a continuous process and disregard the difference between two stages (Sternberg, 2006; Yuan and Woodman, 2010; Pratoom, 2012), which disrupts a more nuanced understanding of the innovation process, particularly which individual factors influence which stage.

Forth, there is a more general reason. The implementation research community lacks a common understanding of what idea implementation is. Sometimes it is seen as a compound of idea selection, evaluation, championing, prototyping, and innovation adoption (Hammond *et al.,* 2011). Sometimes these concepts are viewed as separate stages of the innovation process (Eveleens, 2010; Perry-Smith, 2014), and sometimes they can be used interchangeably with implementation (Anderson and King, 1991; Sears and Baba, 2011; Gupta, 2018).

In order to eliminate confusion from the start, it is necessary to define a theoretical approach to idea implementation that will be applied in the current study. It will set the grounds for a proper understanding of idea implementation concept and for deriving a definition of implementation process suitable to the aims and scope of this study.

2.6.1 Theoretical perspective on idea implementation

It is important to conceptualize the studied phenomenon in order to choose the right course for future studies and frame the research properly. According to Real and Poole (2005), there are four perspectives on theoretical approaches to implementation (Table 1).

Table 1. Concepts of implementation (Real and Poole, 2005)

	Fixed	Adaptive
Variance	Rollout	Modification
Process	Programmed	Transformation

They are derived using two dichotomies:

1. Variance theories (e.g. Zaltman and Duncan, 1977) viewing implementation as an outcome and process theories viewing implementation as a process (e.g. Van de Ven, 1980)
2. Theories suggesting that innovation is complete when implementation starts (fixed view) and theories regarding implementation as a fluid process that can bring change in innovation, e.g. during product design process (adaptive view).

At the intersection of these two dichotomies, there are four concepts representing four different views on implementation, which outline the way implementation is defined and the type of research design implied.

Rollout concept of implementation (Fixed-variance) can be found in the studies on influencing factors that determine the success or failure of innovation (e.g. Damanpour, 1991). In this

view, innovation is seen as completed already at the beginning of the implementation stage (no modifications are needed) and its success largely depends on a proper roll out in the organization. Simply put, here implementation is viewed as adoption of innovation, e.g. adoption (implementation) of a new electronic data system by the individuals in the organization. Most of the implementation literature is taking this view when studying implementation (Real and Poole, 2005).

Modification concept of implementation (Adaptive-variance) emphasises change and modification of initial innovation taking place during implementation that can help to adapt innovation to necessary user groups or context. Here in the implementation stage, innovation is modified several times in order to generate different variants of innovation, and then the most successful variant is adopted. Example on the individual level: two variants of earphone design are proposed and the best one is implemented. This concept is mostly used in studies of conditions for or types of successful modifications of innovation on the implementation stage (e.g. Rogers, 1995).

Programmed concept (Fixed-process) is widely used by researchers in order to study characteristics of the implementation process such as stages and activities successfully driving innovation on the implementation stage. In this view, the implementation does not imply any change in innovation, and the attention of researchers is paid to the stages or activities of the implementation process that bring it to success, such as planning or management (Zaltman and Duncan, 1977). On the individual level, it can be the research on what activities individuals are engaged in during the innovation implementation.

Transformational concept (Adaptive-process) views implementation as a process in which innovation is constantly modified and adapted to the extent that it is difficult to predict the final outcome. This perspective is the most difficult for researchers as it views implementation as a dynamic, changing, and fuzzy process (Poole *et al.,* 2000).

For the purpose of this study, I assume a programmed view on the implementation process as in the scope of this study I view implementation as a process that includes a sequence of various activities taken by individuals gradually transforming an abstract idea into a product, process, or service. According to the Schumpeterian view on innovation (Schumpeter, 1939), this process should also result in added value for innovation users.

2.6.2 Definition of idea implementation

Outlining the implementation concept allows deriving the definition of the implementation that will be used in this study. There is no accepted definition of idea implementation in the

literature as many researchers tend to come up with own definition loosely describing their perspective on implementation (Table 2). Many implementation scholars while extensively discussing innovation implementation in their studies do not provide any definition at all, probably considering it self-evident and known. All this indicates that implementation is still a blurry concept that lacks a clear understanding.

Table 2. Selected definitions

	Definition	Authors
1	Implementation is the 'payoff' stage of the innovating process; the innovation is put in place, and the process of embedding it in the organization becomes the central activity	Nord and Tucker 1987
2	Idea implementation is a social process with the elements of the process being events that occur between people	West & Farr 1990
3	Implementation stage is the transition period during which targeted organizational members ideally become increasingly skillful, consistent and committed in their use of an innovation	Klein and Sorra 1996
4	Implementation is the process of gaining targeted employees' appropriate and committed use of an innovation	Klein and Sorra 1996
5	Innovation implementation is about doing new things, while creativity is thinking about new things	West and Rickards 1999
6	Idea implementation is what happens after a decision to adopt has been made	Real and Poole 2005
7	Implementation is a convergent phase directed towards the development and launch of innovations in order to acquire their benefits	Jong 2007
8	Idea implementation describes the process of converting ideas into new and improved products, services, or ways of doing things	Baer 2012
9	Idea implementation refers to transforming the innovative and valuable ideas into products, services and processes	Skervalaj, Cerne and Dysvik 2014
10	Implementation stage is where new ideas are put into practice, resulting in actual, tangible changes to products, services, processes, or other aspects of organizational functioning	Birdi, Leach and Magadley 2016
11	Implementation is a process comprising all events, activities, and decisions which ideally lead to a routine usage of the innovation	Baporikar 2017

As Table 2 shows, different definitions capture different important aspects of the implementation process, such as the transformation of ideas into products or an emphasis on action (doing) or, most importantly, a social nature of the implementation process, which will be discussed and elaborated on in the next section.

Nevertheless, for the purpose of this study, the definition given by Baporikar (2017) seems to be the most comprehensive and relevant to the adopted perspective. Baporikar (2017) defined implementation as a process comprising "all events, activities, and decisions which ideally lead to a routine usage of the innovation" (p.18). It goes in line with the widely cited definition of Klein and Sorra (1996) who defined implementation as the "transition period during which targeted organizational members ideally become increasingly skilful, consistent, and committed in their use of an innovation" (p. 1057). However, in my opinion, Baporikar's definition is more comprehensive as it includes, though smoothly defined, such important

aspects of the implementation process as activities and decisions. The only parts to be added concern:

a) social nature of the implementation process, which is particularly important on the individual level (Baer, 2012), and
b) added value or benefit from the idea implementation that seems to be generally neglected by the implementation scholars (Table 2).

As a result, the definition of idea implementation takes the following form:

Implementation is a social process comprising all activities and decisions that lead to a routine usage of innovation and bring added value for innovation users.

2.6.3 Idea implementation as a socio-political process

In the innovation literature, when comparing idea generation and idea implementation stages of the innovation process, the vast majority of innovation scholars emphasise a social nature of the implementation process as opposed to the idea generation process that is viewed more like an individualistic experience of idea creation.

The implementation stage is inherently social because it is grounded in interactions and connections among individuals whereby the success or failure of the implementation process is dependent on their assistance, involvement, and support (Axtell *et al.,* 2000; Patterson, Kerrin and Gatto-Roissard, 2009; Baer, 2012).

Innovation, which is, in essence, an implemented idea, occurs when an idea generated on the first stage of the innovation process is being applied into practice. It includes bringing the idea to the attention of the decision-makers in the organization, presenting this idea in a smart way that can win their approval, receiving their permission to start idea realization, acquiring support from colleagues and other stakeholders in a form of their knowledge, expertise, time and resources necessary for idea implementation, and then diffusion of the innovation among potential users. It is evident that innovation/idea implementation requires a massive involvement of other individuals that underscores its social nature (Yuan and Woodman, 2010).

As implementation implies that before it starts the permission should be obtained from decision-makers it is viewed also as a political process (Baer, 2012). The individual engaging in the process of idea implementation should understand the power structure of the organization as well as the strategy and values of the organization in order to align and successfully negotiate the implementation process within this organization. Understanding of

organizational politics can also help to “sell” the ideas to the decision-makers and find support and involve the right people.

Baer (2012) suggests that in order to be effective in navigating the socio-political process the innovative individual should possess substantial social skills and strong motivation so he or she can successfully surmount criticism, obtain support and sponsorship, and persist in the face of resistance people usually express when encountering new and creative ideas.

2.6.4 Elements of idea implementation process

In order to use innovation, an individual should undertake a set of actions that helps to transform an abstract idea into a tangible product, process or service (Skerlavaj, Cerne and Dysvik, 2014). According to the accepted two-stage model of the innovation process, the implementation process encompasses everything that happens after the idea is generated. It includes such activities as idea evaluation, selection and elaboration, idea championing, prototyping, and innovation adoption (Howell and Boies, 2004; Beaudouin-Lafon and Mackay, 2009; Hammond *et al.,* 2011; Kokoulina *et al.,* 2019).

Different researchers attribute to implementation stage different combinations of activities or elements, depending on what elements they are focusing on in their research. However, in this study, in accordance with the selected definition of idea implementation (adapted from Baporikar (2017) in section 2.6.2 Definition of idea implementation) all mentioned stages will be included in the implementation stage (Figure 7).

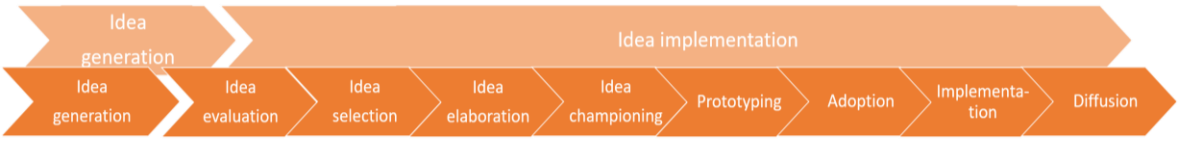


Figure 7. Elements of idea implementation process (adapted from Anderson, Potocnik and Zhou (2014))

Idea evaluation and idea selection are preparatory stages of the implementation process where among all ideas produced in the idea generation process, the worthiest ones are selected based on certain criteria for their evaluation (Hammond *et al.,* 2011). In these stages, the individual can act alone using his or her own analytical abilities.

Idea elaboration includes the development of the idea in order to enhance its potential (Perry-Smith, 2014). Refinement of the idea can happen in isolation but more often it is a collective process where different individuals contribute with their knowledge and experience.

Idea championing is by far the most socially active part of the implementation process, which requires significant social skills and involves interactions with stakeholders and decision-makers in order to promote the idea (Howell and Boies, 2004).

Once idea receives the approval for implementation, the prototyping stage follows. At this stage, also called development or realization by some researchers, the prototype of the future product, process, or service is created in order to check the idea's feasibility (Eveleens, 2010). The prototype is evaluated by the decision-makers and a decision about "go/no go" is made. It marks the adoption stage of the innovation process. Adoption is followed by the actual implementation of the idea whereby the idea takes the form of a finished product, process, or service. It is important to differentiate between adoption and implementation: innovation can be adopted by the organization, but the subsequent implementation of this innovation can fail (Klein and Knight, 2005).

Many innovation scholars have difficulty identifying where the innovation process actually ends (Eveleens, 2010). Some state that it ends when the innovation is implemented, some consider the process of launch, some go further and end the innovation process with the post-launch stage, which implies support for innovation and even efforts for scaling up. In this study, it is assumed that the innovation process ends with diffusion when innovation is communicated within the organization or to the potential innovation users (Jong, 2007). Post-launch activities such as obtaining feedback on innovation from the users and planning further improvement or launching new innovation on the basis of the current one are included in the diffusion stage in this study.

On each of the above-mentioned sub-stages, different individual factors play their role as important drivers of innovation. However, the theory suggests that in the implementation stage individual factors manifest the most prominently in activities that are the most reliant on social interactions (Baer, 2012).

As mentioned, implementation is an inherently social and even socio-political process (Axtell *et al.,* 2000; Patterson, Kerrin and Gatto-Roissard, 2009; Baer, 2012). From the outset, idea implementation is carried out by the individuals who are motivated to bring change, possess knowledge on how to do it and have social skills allowing them to get necessary support and resources in order to promote the implementation of their idea. Collaboration with team members, partners, suppliers, and particularly with decision-makers is central to idea implementation as the success or failure of implementation is largely dependent on how well

the individual can manoeuvre and influence socio-political processes in his or her organization, convince decision-makers to allocate resources or persuade professionals to share their expert knowledge (Skerlavaj, Cerne and Dysvik, 2014). These change agents or "idea sellers" are known as idea champions.

Champions are active individuals who possess the necessary knowledge about the technical side of the innovation, market situation, and company power structure that makes them successful in the promotion of new ideas in the organization (Kokoulina *et al.,* 2019). They know who the key decision-makers are and how to present an idea in order to ensure its sponsorship (Andersson and Bateman, 2000). Their activities targeting idea promotion are called championing activities. Championing activities are crucial for the success of innovation implementation (Howell and Boies, 2004).

Though some researchers see championing as a separate stage of the innovation process (Howell and Boies, 2004; Perry-Smith, 2014), others point out that championing activities permeate the whole implementation stage (Skerlavaj, Cerne and Dysvik, 2014; Kokoulina *et al.,* 2019). In line with the latter view, I propose to consider championing as an integral part of the implementation process. Individuals successfully carrying out championing activities usually possess significant communication and negotiation skills and exhibit influence behaviours in order to obtain necessary resources and support (Perry-Smith, 2014; Skerlavaj, Cerne and Dysvik, 2014).

Other elements of the implementation process such as idea selection, evaluation and elaboration, prototyping, and innovation adoption are also dependent on social interactions, the motivation of individuals, and technical knowledge to a different extent. Therefore, it is logical to assume that they are influenced by similar individual factors but to a lesser extent.

As it becomes apparent from the analysed literature, the innovation implementation process is much more complex and challenging than it is generally assumed (Real and Poole, 2005; Magadley and Birdi, 2012). Although it is no less important for innovation success than the idea generation stage, much less attention has been paid to idea implementation both by researchers and managers (Magadley and Birdi, 2012). Although idea generation and particularly factors facilitating idea generation on the individual level and indicating creative individual have been studied thoroughly (Amabile, 1988a, 1988b; Sternberg and Lubart, 1996; Jong, 2007), factors facilitating idea implementation have only started to be articulated and investigated in implementation research (Magadley and Birdi, 2012).

The topic of implementation itself clearly requires more research. Apart from the lack of general consent on implementation definition, the researchers still did not agree on the constituent elements of the implementation process (Howell and Boies, 2004; Beaudouin-

Lafon and Mackay, 2009; Hammond *et al.,* 2011; Kokoulina *et al.,* 2019, among others). To address these issues, this study introduced a comprehensive definition and an integrated view on what elements the idea implementation stage consists of. Besides, the central role of the individual in the innovation process in general and in the implementation process in particular was emphasised and used as a fundamental perspective defining the direction and outcomes of research (Sears and Baba, 2011; Baer, 2012).

Innovation implementation is driven by individuals and vitally important for the company's competitiveness and survival (Choi and Price, 2005). And nevertheless, it is still unclear, what qualities, skills, or abilities the individuals should possess in order to successfully implement innovation (Anderson, Potocnik and Zhou, 2014). To date, there is no comprehensive framework that contains individual factors that are important for the promotion of idea implementation.

The aim of this study is to derive a framework of individual factors that promote the implementation of innovation in an organization. In the next chapter, the research methodology for building and validating this framework will be discussed.

3 METHODOLOGY

Methodology guides the researcher and explains how the research is conducted in practice in order reach its aims and answer the research questions (Sileyew, 2019). This chapter starts with an explanation of research approach adopted in this study and research design describing how the research was organized in order to ensure valid and accurate results. Also, it describes the research methods used.

3.1 Research approach and design

The research approach defines how the aims of the research are achieved based on what the aims are. Basically, it is a plan that the researcher draws and follows depending on the aims of his or her research. Generally, there are three types of research approaches: qualitative, quantitative, and mixed methods (Creswell and Creswell, 2017).

- Quantitative approach is used when it is necessary to test the theory and examine the relationship between variables. In the quantitative approach, surveys and experiments are used in order to obtain numerical data suitable for statistical analysis. The researcher assumes an independent position in relation to the studied object (Saunders *et al.,* 2016).
- Qualitative approach is used when it is necessary to investigate the meaning that people give to phenomena and study their understanding of the world. Nonnumerical data is usually gathered through observations and interviews and analysed through the interpretation of its meaning by the researcher (Creswell and Creswell, 2017). As a result, the research outcome is dependent on the position of the researcher and his or her interpretation of data, although usually, researchers are aiming to stay as objective and unbiased as possible.
- Mixed approach is a combination of qualitative and quantitative approaches, which is used when one approach is not enough for the understanding of a problem or phenomenon (Creswell, 2013).

In the frame of this study, a qualitative approach is adopted. According to Saunders et al. (2016), this approach is suitable for the development of conceptual frameworks using variable data collection techniques. Also, a qualitative approach is often used for studying new and emerging concepts, such as idea implementation on an individual level that has attracted the attention of innovation scholars only recently. Data collection in qualitative research is carried out using interviews and observations and also from textual and visual data sources (Eriksson and Kovalainen, 2008). Interviews can be structured and standardized, semi-structured and

unstructured depending on the aims of the interview ranging from obtaining information about facts (structured interview) to in-depth exploring interviewee's perspective on the topic (unstructured or open interviews).

Although qualitative research is mostly associated with inductive approach to theory development, sometimes it can begin with deductive approach if there is a need to examine existing theory or framework using qualitative methods (Yin, 2014). This research is following the deduction logic because it is based on the known theories and concepts and is aiming to deduce necessary information from there (Eriksson and Kovalainen, 2008). A deduction is used in research for building the body of theoretical knowledge (Saunders *et al.,* 2016), which is instrumental for such a little-studied research area as innovation implementation on the individual level.

Due to the relative novelty of the topic, current research is exploratory in nature. Exploratory research is used to improve the understanding of the phenomenon and bring clarity to those aspects of it that are currently ill-defined. Research questions beginning with "What" and "How" are usual markings of exploratory study (Saunders *et al*., 2016). Current research explores the dispersed individual-level factors promoting innovation implementation in order to collect them in one place, identify their relationship to idea implementation and deduce the way how they can be categorized that lays the ground for the framework development. Exploratory research is often an attribute of the qualitative approach as it is asking open questions in order to get insights into the nature of the phenomenon (Saunders *et al*., 2016).

According to Saunders et al. (2016), if qualitative research design is employing one data collection method, it is called mono method qualitative study, and if two or more data collection methods are employed, it is called multi-method qualitative study. Consequently, this study can be referred to as a multi-method study as in this study, research design includes two methods:

1. Structured literature review in order to derive an Integrated Framework for the idea implementation stage of innovation process on the individual level (IFII), and
2. Framework's expert validation.

The first method is a structured literature review. This method is used for comprehending and organizing large amounts of information and mapping the studied area. The structured search usually results in a big number of 'hits' that makes it rather time-consuming as a lot of information, sometimes of little relevance, has to be reviewed. Although it limits the number of 'hits' that are read and analysed it nevertheless helps to identify central literature for the topic (Armitage and Keeble-Allen, 2008). In this study, a structured literature review has been done in two iterations:

- First, for framing the issue and building a solid theoretical background. Starting as a preliminary literature review for identifying the research gap, it eventually assumed a structured form for the critical assessment of the existing body of knowledge. It allowed recognizing concepts and theories that could serve as building blocks for the current study. Ultimately, these blocks of information constituted a theoretical framework of this study. Top-down approach was used in order to lead the narrative from general (innovation) to specific (idea implementation stage). It allowed to draw a bigger picture and outline the place of a central topic (idea implementation) on the broader canvas and in a more general research. As the process of this iteration is similar for any research, this iteration will not be examined in greater detail in the Research method section.
- Second, another iteration of the structured literature review was conducted in order to identify individual-level factors pertaining to the idea implementation stage of the innovation process. It was more narrowly focused. This iteration aimed to define individual-level factors that are claimed to facilitate innovation implementation and are explicitly attributed by the researchers to the idea implementation stage. The selection criteria for the articles will be explained in the next section in greater detail. Besides, during the same iteration, the principles for categorization of individual-level factors have been derived from the existing literature. This second iteration of the literature review was instrumental for building the basis for the development of the Integrated Framework for the idea implementation stage of innovation process on an individual level (IFII).

The second method employed in this study is expert validation. Validation is a process aiming at verification of obtained research outcomes in order to prove that they are valid and credible (Saunders *et al.,* 2016). As the developed framework is the first attempt of this kind to categorize individual-level factors pertaining to innovation implementation, it should be validated, and its consistency and reliability should be established (Hosseini *et al*., 2017).

There are two ways of validation: triangulation and participant or expert validation (Saunders *et al.,* 2016). Considering that the topic is relatively new, and no comparable framework exists, triangulation would be difficult to perform. Though while retrieving the factors from different literature sources originated from different domains of knowledge, to a certain extent some triangulation has been achieved.

Expert validation involves the evaluation of research outcomes by the experts in the field, in this case, in the field of innovation. Experts may comment on the research outcomes, their relevance, and accuracy, and make suggestions for their correction. These suggestions can

be integrated or dismissed by the researcher depending on their credibility and how many experts suggested the correction. For the purpose of validation, in this study, a number of experts from academia have been approached. They have been asked to express their opinion on IFII using a specially developed online questionnaire. Interviews as a common approach to expert validation have been ruled out. It would be tiresome both for the experts and interviewer to hold interviews on such a complex topic, particularly considering the number of factors constituting IFII (20 factors spread across four categories). The length of the question list and recurrent questions from category to category could diffuse attention and influence the accuracy of experts' judgment. Time constraints set by the temporal frame of the master's thesis writing period also contributed in favour of choosing the questionnaire option.

In the next section, the practical application of the mentioned methods is described in more detail.

3.2 Research method

3.2.1 Structured literature review

Structured literature review for identification of the individual-level factors facilitating innovation implementation began during the first iteration of literature review for building theoretical background. After a number of individual-level factors have been identified in the literature and the idea for IFII was born, the question about determining the categorization approach for the factors has arisen.

As the main purpose of the IFII development is to figure out, which factors enable individuals to effectively implement their ideas, it was decided to have a look at similar frameworks. The idea implementation stage could not provide any comprehensive framework, so the attention turned to the idea generation stage of the innovation process that has been explored in much greater depth.

After analysing a few frameworks, the Componential model of creativity in organizations proposed by Amabile (1983) was selected as an inspiration and the most suitable approach to categorization. This model is thoroughly described in section 2.5 Idea generation stage. Amabile (1983) states that this model showcases the most important factors that an individual should possess in order to be creative in the chosen domain(s) (Fig. 8, left). In line with her, McAdam and McClelland (2002) attribute this model to the idea generation stage as a representation of individual-level factors promoting the generation of creative ideas. Thus, the model is deemed suitable for categorizing individual-level factors promoting the implementation of creative ideas, which is the essence of innovation. Therefore, the

categorization approach employed in the Componential model of creativity in organizations was theoretically extended and applied to the idea implementation stage.

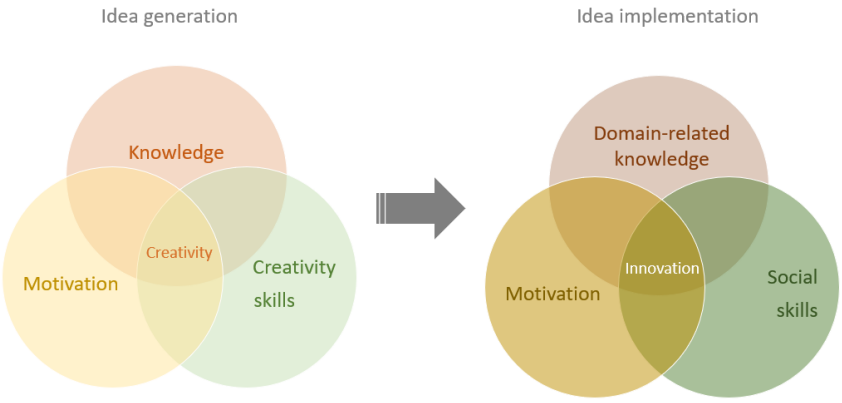


Figure 8. Componential model of creativity (Amabile, 1983) (left) and proposed model of individual innovation (implementation stage of innovation process) (right)

Guided by Birdi, Leach and Magadley (2016), the facets of this model were adopted for IFII as a high-level approach for structuring individual-level factors pertaining to the implementation stage into three main categories: Domain-related knowledge, Motivation, and Social skills as idea implementation is less a creative and more a socio-political process (Baer, 2012; Magadley and Birdi, 2012) (Fig. 8, right).

When the categorization principle was established, all newly found factors started to get allocated into these three categories accordingly. However, eventually, a group of factors was discovered in the literature that did not fall into any of the mentioned categories. Many of these factors were related to the individual's qualities and character traits indicative of implementation-oriented behaviour and predictive of successful innovation implementation. Due to the high occurrence of these factors in the analysed literature, it was decided to add a fourth category titled Personality traits.

After the categorization approach was established, the full-fledged structured literature review aiming at the identification of individual-level factors pertaining to the idea implementation stage of the innovation process has commenced. In this iteration of structured literature review, bottom-up and top-down approaches were employed. The bottom-up approach is used for less studied research areas as it helps to build a general knowledge of the subject and familiarise the novice researcher with the essential concepts. In this approach, research starts with the identification of keywords and terms and finding related articles, skimming through the abstracts, and figuring out which articles are closely related to the area of research interest. Then, the most relevant articles are read carefully, whereas the most important

concepts are outlined, and notes are taken accordingly. In the top-down approach, the search is used for specific references which implies that the researcher already has substantial knowledge of the subject.

In both approaches, the guidelines proposed by Webster and Watson (2002) were applied, namely:

- Leading journals in the field were identified as having a higher potential to include the most valuable and strong contributions. For that, JUFO Publication forum was used.
- Different domains of knowledge were investigated as while building the theoretical background it was revealed that the individual-level factors facilitating innovation in organizations belong to interdisciplinary field and are studied in such disciplines as Organizational Psychology, Organizational Behaviour, Management and Psychology.
- Backward search from every relevant article was conducted in order to identify potential contributions from prior research.
- Forward search from every relevant article was conducted as well in order to identify new possible directions for research.

These guidelines ensured that a relatively complete and comprehensive bulk of relevant information has been collected. Though it is possible that some articles were missed, I feel confident that essential information has been accumulated as while reading through the article I kept stumbling upon the same names and the same references.

The literature search was organized using three databases: Scopus, Web of Science, and Google Scholar. In the bottom-up approach, the following keyword strings and Boolean operators were used: (1) “Innovation” AND “Idea implementation” AND “Individual”, (2) “Innovation” AND “Innovative behaviour”, (3) “Innovation” AND “Idea champion*”. Since all three databases could potentially contain the same articles (which is particularly true for the Google Scholar database), the fast brushing through the retrieved articles was made in order to eliminate duplicates.

The subsequent abstract screening revealed that a substantial number of articles belonging to a group and organizational level of analysis made it into the selection, although keyword strings were deliberately chosen to indicate the individual level of analysis. First, the word “individual” was used. Second, “innovative behaviour” was used that is usually attributed to the individual or sometimes, to the group of individuals. Third, “idea championing” is explicitly attributed to the individual. One explanation could be that those keywords were mentioned in the abstracts, but the article observed them from an organizational or group perspective, for example, how to promote innovative behaviour on the organizational level.

The search period for the articles encompassed the last two decades in order to ensure that only recent advances in implementation science on an individual level are included in IFII. However, during a backward search, a few worthy contributions from earlier times have been identified additionally.

The process of literature search with an indication of all operations conducted and the number of hits returned is presented in Figure 9.

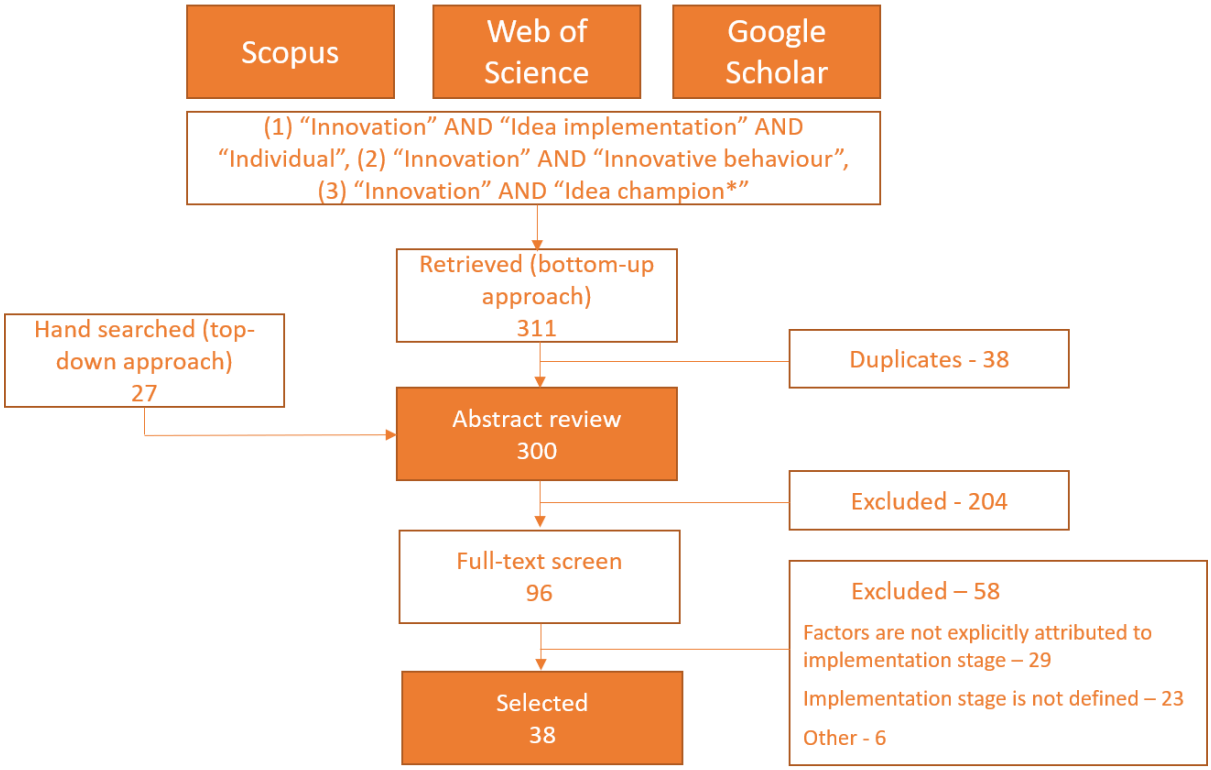


Figure 9. The process of literature search

Admittingly, there are not many articles that comply with the search criteria. As mentioned before, it can be explained by the fact that implementation was not a popular topic for innovation scholars (Magadley and Birdi, 2012). Even when being studied, it was examined mostly on the organizational level or group level (Axtell *et al.,* 2000; Choi and Price, 2005). Besides, in many articles, the difference between the stages has been disregarded (Yuan and Woodman, 2010) or the individual-level factors have been attributed to the whole innovation process (Hammond *et al.,* 2011).

The following search criteria have been additionally imposed to refine search results and make a more accurate contribution to IFII:

- First, only factors that were explicitly attributed by the authors to implementation stage were included into IFII to eliminate confusion with factors pertaining to idea generation stage. It explains a humble number of articles that were eligible for building IFII.
- Second, in the scope of this study, idea implementation stage encompasses idea championing that some researchers see as a separate stage of the innovation process (e.g. Howell and Boies, 2004) but, in line with Kokoulina et al. (2019), I argue that championing activities permeate the whole implementation stage and thus can be included. Therefore, the articles on idea championing and its role in innovation implementation have been included in the final article selection.

The final article selection is represented in Table 3. Table 3 also indicates which articles made contributions to which categories (darker shade of orange) with factors attributed to idea implementation stage on an individual level.

Table 3. Selected articles for IFII development with domains of origin

	Article	Domain	Domain-related knowledge	Motivation	Social skills	Personality traits
1	Anderson and Bateman (2000)	Organizational Behaviour				
2	Anderson and Gasteiger (2008)	Organizational Psychology				
3	Ardagna and Lusardi (2008)	Economics				
4	Baer (2007)	Organizational Psychology				
5	Baer (2012)	Organizational Psychology				
6	Baer et al. (2015)	Organizational Psychology				
7	Binnewies and Gromer (2012)	Organizational Psychology				
8	Birdi, Leach and Magadley (2016)	Organizational Psychology				
9	Carmeli, Meitar and Weisberg (2007)	Management				

10	Cerinsek and Dolinsek (2009)	Organizational Behaviour				
11	Černe et al. (2016)	Management				
12	Da Silva and Davis (2011)	Management				
13	De Jong and Den Hartog (2008)	Organizational Behaviour				
14	Howell, Shea and Higgins (2005)	Organizational Psychology				
15	Howell and Boies (2004)	Organizational Behaviour				
16	Jacobs et al. (2015)	Public Health Care				
17	Janssen, Van de Vliert and West (2004)	Organizational Psychology				
18	Klein and Knight (2005)	Organizational Behaviour				
19	Kumar and Bharadwaj (2016)	Psychology				
20	Markham (2002)	Management				
21	Ngah and Salleh (2015)	Management				
22	Patterson (2002)	Organizational Psychology				
23	Patterson, Kerrin and Gatto-Roissard (2009)	Organizational Psychology				
24	Perry-Smith and Mannucci (2017)	Organizational Behaviour				
25	Potočnik, Anderson and Latorre (2015)	Organizational Psychology				

26	Roffe (1999)	Management				
27	Schilling and Bennett (2018)	Management				
28	Škerlavaj, Černe and Dysvik (2014)	Management				
29	Škerlavaj et al. (2019)	Management				
30	Standing et al. (2016)	Management				
31	Sternberg (2006)	Psychology				
32	Sternberg and Lubart (1996)	Psychology				
33	Walter et al. (2011)	Management				
34	Wu, Parker and De Jong (2014)	Organizational Behaviour				
35	Yesil and Sozbilir (2013)	Organizational Behaviour				
36	Zennouche, Zhang and Wang (2014)	Management				
37	Zhang, Chen and Sun (2015)	Management				
38	Zhou and Shalley (2003)	Organizational Behaviour				

It is worth noting that more than half of the articles came from the Psychology-related domains, which underscores the importance of a person-centred approach in implementation research.

In analysing the selected articles, a summary record taking technique was employed in order to record all contributions that were worth noting. For that purpose, a series of Excel tables have been designed. Summary record taking facilitates comparison and analysis of the information found (Easterby-Smith *et al.,* 2018), which is particularly useful when working with numerous information sources.

While reviewing the factors included in summary records it was revealed that some factors were called differently though indicating the same thing. In order to bring in clarity, the procedure of clustering has been conducted in order to derive factors that will form IFII. Repeated factors and very similar factors were clustered to form an overarching factor as shown in Figure 10. It allowed for a comprehensive yet concise layout of IFII that gives a distinct overview of factors without going to the details unnecessary for the purposes of this framework.

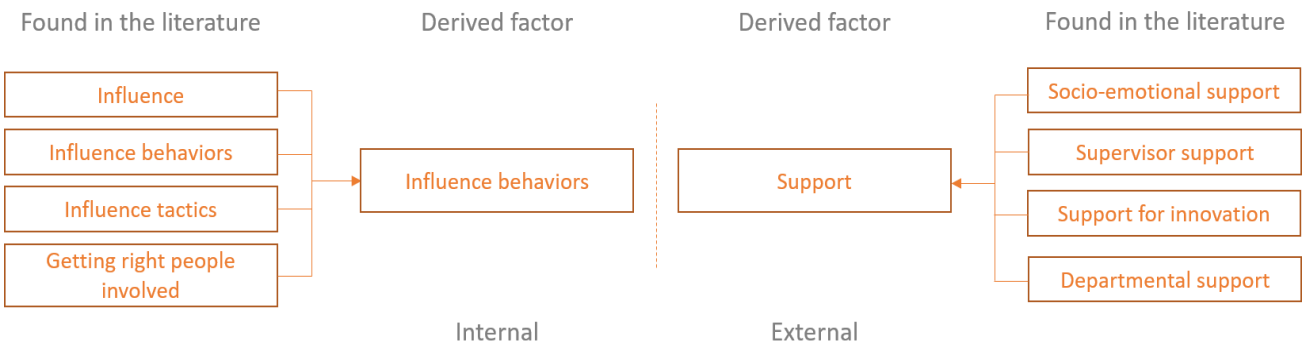


Figure 10. Procedure of clustering factors found in the literature

Altogether, 29 internal and 14 external factors have been derived using the clustering procedure (Fig. 10). Internal factors are characterising the individual and what the individual should possess in order to successfully implement the idea. External factors are the factors influencing from the external environment that can promote or impede the idea implementation for the individual. Although they will not be used for developing IFII, external factors have been included in the summary report in order to provide a more holistic approach to structuring implementation factors on the individual level. In line with Amabile (1996), who made a successful attempt to integrate the Componential model of creativity into an organizational work environment, in this study internal and external factors will allow for a well-rounded picture of innovation implementation in organizational settings on an individual level. It will be described in the Conclusion section in more detail.

The aggregation of 29 internal and 14 external factors is presented in Table 4. Grey area indicates that external factors will not be used for developing IFII.

Table 4. Aggregation of individual level factors promoting innovation on an individual level

Internal factors				External factors		
Domain-related knowledge	Motivati-on	Social skills	Personality traits	Resources	Organizati-onal	Environ-ment
Job knowledge	Intrinsic motivation	Influence behaviours	Self-efficacy	Time	Innovation climate/culture	Challenge
Operational skills	Extrinsic motivation	Ability to network	Self-leadership	Money	Company strategy	Uncertainty
Contextual knowledge		Communica-tion skills	Conscientious-ness	Support	Policies and practices	Complexity of job
Innovative cognitive style		Legitimacy	Proactive personality	Autonomy	Learning orientation	
Analytic ability		Issue presentation	Risk tolerance	Technological resources		
Scanning behaviours			Need for achievement	Intellectual resources		
Knowledge sharing			Extraversion	Physical space		
Developmental factors			Responsibility			
			Emotional intelligence			
			Confidence			
			Flexibility			
			Commitment			
			Perspective taking			
			Openness to experience			

From 29 internal factors, only factors that have been mentioned more than two times in the different analysed articles have been considered for IFII. This criterion was applied in order to pick only the most scientifically acknowledged factors and in this way warrant their relevance for IFII. Less mentioned factors are going to be used to define possible directions for future research. This selection resulted in 20 internal factors. The factors and categories they have been allocated to, with the respective literature sources, are present in Table 5. In the future research, operationalization for each factor will be stablished.

Table 5. Literature sources for each factor and category

	Categories and factors	Authors
I	Domain-related knowledge category	Amabile, 1983
1	Job knowledge	Patterson, 2002; Anderson and Gasteiger, 2008; Patterson, Kerrin and Gatto-Roissard, 2009; Zennouche, Zhang and Wang, 2014; Potocnik, Anderson and Lattore, 2015; Birdi, Leach and Magadley, 2016; Standing *et al.,* 2016
2	Operational skills	Markham, 2002; Birdi, Leach and Magadley, 2016
3	Contextual knowledge	Sternberg and Lubart, 1996; Howell and Boies, 2014; Sternberg, 2006; Da Silva and Davis, 2011; Birdi, Leach and Magadley, 2016
II	Motivation category	Amabile, 1983
4	Intrinsic motivation	Patterson, 2002; Baer, 2007; Anderson and Gasteiger, 2008; Patterson, Kerrin and Gatto-Roissard, 2009; Baer, 2012; Binnewies and Gromer, 2012; Zennouche, Zhang and Wang, 2014; Birdi, Leach and Magadley, 2016; Perry-Smith and Mannucci, 2017; Schilling and Bennet, 2018
5	Extrinsic motivation	Roffe, 1999; Patterson, 2002; Zhou and Shalley, 2003; Baer, 2007; Patterson, Kerrin and Gatto-Roissard, 2009; Da Silva and Davis, 2011; Baer, 2012; Zennouche, Zhang and Wang, 2014; Jacobs *et al.,* 2015
III	Social skills	Adapted from Amabile (1983)
6	Influence behaviour	Anderson and Bateman, 2000; Markham, 2002; Howell and Boies, 2004; Howell, Shea and Higgins, 2005; Sternberg, 2006; Baer, 2007; De Jong and Den Hartog, 2008; Skerlavaj, Cerne and Dysvik, 2014; Wu, Parker and De Jong, 2014; Zhang, Chen and Sun, 2015; Perry-Smith and Mannucci, 2017
7	Ability to network	Markham, 2002; Baer, 2007; Ardagna and Lusardi, 2008; De Jong and Den Hartog, 2008; Patterson, Kerrin and Gatto-Roissard, 2009; Walter *et al.,* 2011; Baer, 2012; Baer *et al.,* 2015; Cerne *et al.,* 2016; Skerlavaj *et al.,* 2019

8	Communication skills	Klein and Knight, 2005; Sternberg, 2006; De Jong and Den Hartog, 2008; Patterson, Kerrin and Gatto-Roissard, 2009; Birdi, Leach and Magadley, 2016; Skerlavaj *et al.,* 2017
9	Issue presentation	Roffe, 1999; Anderson and Bateman, 2000; Markham, 2002; Howell and Boies, 2004
10	Legitimacy	Howell and Boies, 2004; Perry-Smith and Mannucci, 2017
IV	Personality traits	Adapted from Amabile (1983)
11	Self-efficacy	Howell and Boies, 2004; Howell, Shea and Higgins, 2005; Sternberg, 2006; Carmeli, Meitar and Weisberg, 2007; Anderson and Gasteiger, 2008; Da Silva and Davis, 2011; Walter *et al.,* 2011; Binnewies and Gromer, 2012; Wu, Parker and De Jong, 2014; Zennouche, Zhang and Wang, 2014; Potocnik, Anderson and Lattore, 2015; Kumar and Bharadwaj, 2016; Standing *et al.,* 2016; Schilling and Bennett, 2018
12	Proactive personality	Howell and Boies, 2004; Janssen, Van de Vliert and West, 2004; Anderson and Gasteiger, 2008; Cerinsek and Dolinsek, 2009; Patterson, Kerrin and Gatto-Roissard, 2009; Binnewies and Gromer, 2012; Wu, Parker and De Jong, 2014; Zennouche, Zhang and Wang, 2014; Potocnik, Anderson and Lattore, 2015; Kumar and Bharadwaj, 2016; Standing *et al.,* 2016
13	Need for achievement	Roffe, 1999; Cerinsek and Dolinsek, 2009; Yesil and Sozbilir, 2013; Zennouche, Zhang and Wang, 2014; Standing *et al.,* 2016; Schilling and Bennett, 2018; Skerlavaj *et al.,* 2017
14	Risk tolerance	Sternberg, 2006; Ardagna and Lusardi, 2008; Cerinsek and Dolinsek, 2009; Patterson, Kerrin and Gatto-Roissard, 2009; Potocnik, Anderson and Lattore, 2015; Ngah and Salleh, 2015; Standing *et al.,* 2016
15	Emotional intelligence	Patterson, Kerrin and Gatto-Roissard, 2009; Ngah and Salleh, 2015; Zhang, Chen and Sun, 2015

16	Conscientiousness	Roffe, 1999; Patterson, 2002; Janssen, Van de Vliert and West, 2004; Patterson, Kerrin and Gatto-Roissard, 2009; Yesil and Sozbilir, 2013; Zennouche, Zhang and Wang, 2014; Potocnik, Anderson and Lattore, 2015; Standing *et al.,* 2016
17	Extraversion	Roffe, 1999; Patterson, 2002; Patterson, Kerrin and Gatto-Roissard, 2009; Potocnik, Anderson and Lattore, 2015; Kumar and Bharadwaj, 2016
18	Self-confidence	Cerinsek and Dolinsek, 2009; Wu, Parker and De Jong, 2014; Potocnik, Anderson and Lattore, 2015
19	Commitment	Howell and Boies, 2004; De Jong and Den Hartog, 2008; Perry-Smith and Mannucci, 2017
20	Openness to experience	Patterson, 2002; Anderson and Gasteiger, 2008; Patterson, Kerrin and Gatto-Roissard, 2009; Yesil and Sozbilir, 2013

Completed IFII will be presented and described in the next chapter alongside each constituent factor. Detailed descriptions of categories and factors will be given accordingly.

3.2.2 Expert validation

Expert validation is the second method employed in this research. It has been chosen to justify that the research is done correctly and IFII is viable and robust. As IFII is the first attempt to develop a framework of this kind, expert validation is particularly important.

Following the phenomenological approach, several experts experienced in the phenomenon (innovation field) have been selected using a purposeful sampling strategy ensuring that only respondents capable of making an educated judgment on the topic are chosen (Creswell, 2007). Altogether, 28 experts from academia have been approached in order to validate IFII from a research and scientific perspective. They have been chosen according to their experience in and contribution to the innovation research. After the experts have been identified, they have been sent an invitation to participate in an expert validation of IFII. When their consent has been acquired, the experts have been sent the link to the questionnaire. By establishing the contact prior to sending the link to the questionnaire, a higher response rate was ensured.

As a tool for validation, the questionnaire was chosen as an alternative to conducting expert interviews. The choice has been justified in the previous section. For creating the questionnaire, Qualtrics software for survey tools development was used. The questionnaire consisted of several close-ended and open-ended questions on the topics of (1) quality of research, (2) categorization, and (3) factors. Although this research is qualitative in nature it is not possible to gather necessary information only with qualitative questions. For ranking of relevance and importance of IFII factors as well as accuracy of the definitions, five-point Likert scale questions were used, which adds a quantitative element to the research. For ensuring face validity of the questionnaire, it was peer-reviewed, adjusted, and then reviewed again with two experts prior sending it to the innovation experts from academia for IFII validation. The full version of the questionnaire is presented in Appendix A.

The review process was conducted as follows: once undertaking the questionnaire, the experts first were offered to watch a short 5 min video where the aims, background, research design, and limitations have been explained. After watching the video, experts were presented IFII in a form of a heat map. Definitions of the categories and factors of IFII as presented to the experts in the questionnaire are provided in Appendix B. After observing IFII, the experts were asked to provide their opinion on the relevance of factors for IFII and how much the factors are important for employees in the innovation-intensive sector. Next, experts have been asked to what extent they agree with proposed definitions for the factors. For these questions, a five-point Likert scale was used. Categorization questions followed the same pattern. They have been asked separately in order to allow for a more detailed analysis. Several open-ended questions were inserted after each Likert-scale question to ensure that experts explain their ranking choices. Also, experts have been encouraged to suggest other factors or categories if they deem it necessary. Finally, experts have been asked to provide their overall considerations on the framework and its structure. In this way, a valuable contribution for necessary IFII adjustments has been received.

In order to define which factors should be considered as relevant as a result of expert feedback, the following criteria have been established. For Relevance questions, it was decided to consider answers “Relevant” and “Quite relevant” as sufficient evidence from the experts that the factor is relevant for IFII. To be considered as relevant, each factor should score 4,5, or higher (out of 5) in Relevance questions.

3.3 Data collection and analysis schedule

Data has been collected in two steps. First, for deriving the factors and formulating the approach for categorization, data were collected during August and September 2020. The

questionnaire for expert validation was developed during October 2020. It took a month because it was decided to represent the research background, aims, and design in a form of a video presentation that required additional time to be designed and recorded.

Second, the questionnaire has been forwarded to preliminarily selected experts and has been in circulation during the first two weeks of November 2020. Incoming data have been analysed simultaneously during November and necessary adjustments followed.

As the template for the results section was created beforehand, it made it easier to make modifications even if the data was obtained in the middle of November.

4 INTEGRATED FRAMEWORK FOR THE IDEA IMPLEMENTATION STAGE OF INNOVATION PROCESS ON AN INDIVIDUAL LEVEL

In this section, the final version of IFII will be presented in the form it assumed after the structured literature review, categorization, and validation by academia experts. Further, there will be an overview of categories and factors followed by their descriptions derived from the literature.

4.1 Framework overview

Initially, in accordance with the Componential Model of Creativity (Amabile, 1983), IFII included three categories: Domain-related knowledge, Motivation, and Social skill. However, as a result of the structured literature review, Personality traits category was introduced as it was found to be widely mentioned in the analysed literature.

Below, IFII is represented as a structure of four categories with 20 individual factors unevenly spread across these four categories (Fig. 11). As stated above, from the initial selection, only factors mentioned more than once were included in the final framework.

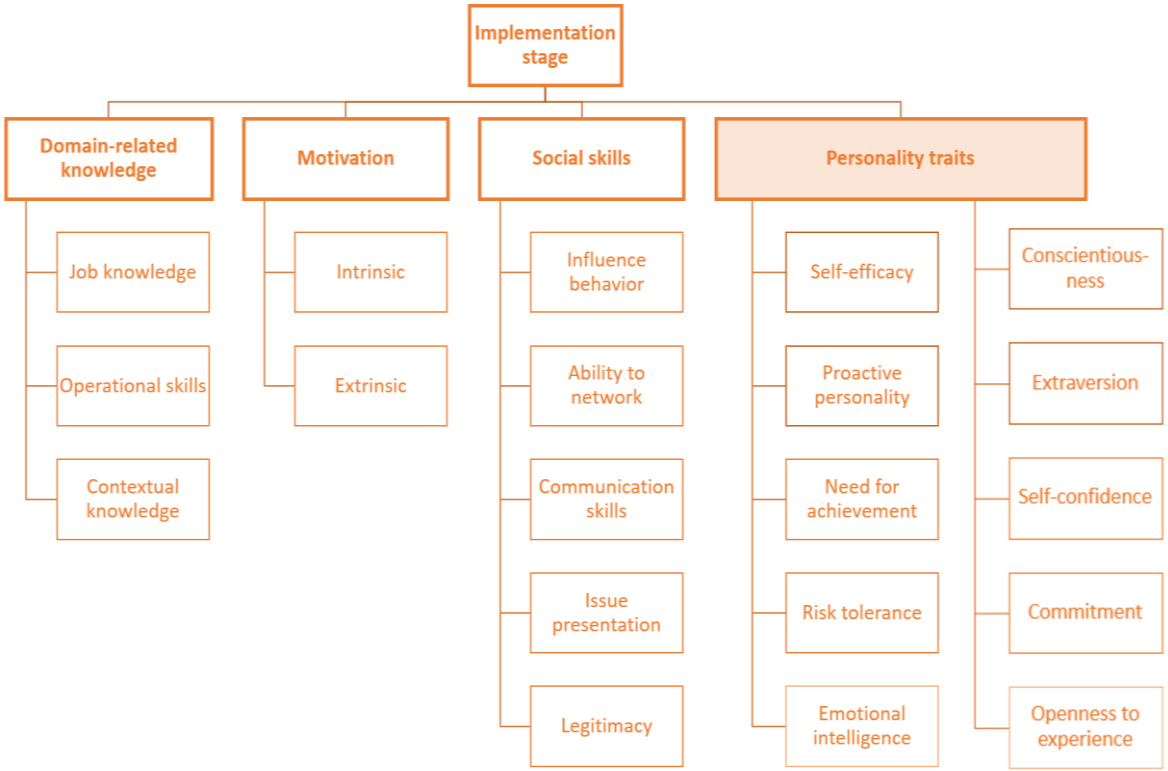


Figure 11. Integrated framework for the idea implementation stage of innovation process on an individual level (IFII)

The scope of IFII comprises individual level factors pertaining to innovation implementation found in the literature to provide a better understanding of what is required on the individual's part in order to increase the success rate of the innovation implementation. When building IFII, it was emphasised that the factors should be attributed to the implementation stage as explicitly as possible in order to eliminate confusion with the idea generation stage factors. Most of previous attempts of building similar framework failed to perform it because they spread their focus too widely and included all factors specific to innovation behaviour or innovation process without ascribing them precisely to the implementation stage.

4.2 Overview of categories

Inspired by and derived from the Componential model of creativity (Amabile, 1983), the categories accepted in IFII are still not their exact copies. Transferred to a new framework, they assumed the context of idea implementation that altered their initial meaning and description to a certain extent. Categories are graphically represented in Figure 12.

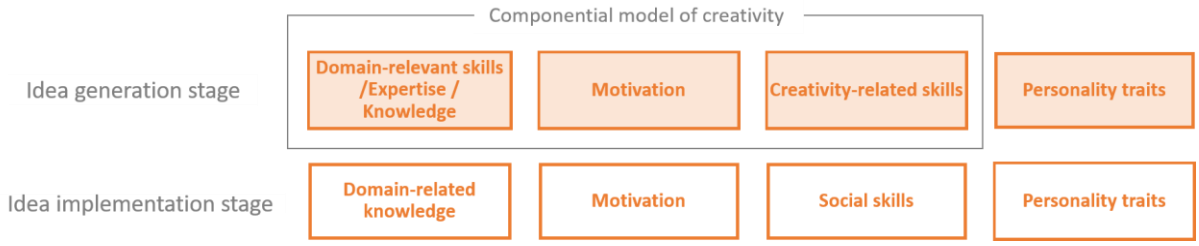


Figure 12. IFII categories as compared to the categories (components) of Componential model of creativity (Amabile, 1983)

Domain-related knowledge. On the idea generation stage, this component includes "knowledge, expertise, technical skills, intelligence and talent in the particular domain in which the problem-solver is working" (Amabile and Mueller, 2007, p.35). All of this is necessary so the individual can produce novel ideas building on his or her prior knowledge with the aid of relevant skills, at the same time checking if the idea is realizable and beneficial judging based on his or her experience in the field.

On the idea implementation stage, this kind of knowledge is still relevant. However, in order to push the idea forward and realize it in practice, knowledge of a different kind is needed too. For example, the individual needs to have the knowledge and practical experience of how to introduce change in an organization because innovation is nearly always about change (Roffe, 1999; Baregheh, Rowley and Sambrook, 2009). To implement the idea successfully, the individual, apart from the knowledge of the domain where the idea is implemented, should

know how to carry out projects, how to manage time and organize workflow, and many other practical things (Markham, 2002). Besides, it is important to know how the decision-making is done in an organization, what are the normative procedures and rules (sometimes even unspoken rules), and how organizational and power structure works in order to get the idea through the organizational silos (Birdi, Leach and Magadley, 2016).

Birdi, Leach and Magadley (2016) defined domain-related knowledge pertaining to the idea implementation stage as a compound of knowledge, skills, and expertise related to domain(s) in which the innovation process takes place necessary for the individual to successfully bring innovation to fruition, which in their opinion includes knowledge about the job or domain itself, knowledge about how to carry out the process of implementation in practice and knowledge of how to acquire support from key decision-makers.

Motivation. Motivation is an essential driver of creativity in the Componential model of creativity (Amabile, 1983). Amabile (1998) posited that even having advanced knowledge of the domain and high proficiency in creativity-related skills, the individual won't get far in generating creative ideas if he or she is not motivated to do it.

On the implementation stage, motivation concerns the desire of the individual to implement creative ideas and bring them to life. On this stage, motivation plays an even more important role as idea implementation is stronger associated with overcoming challenges and adversity than idea generation (Baer, 2012) and thus it requires stronger motivation, so the innovative individual does not give up half-way through the implementation process.

Social skills. As the idea generation stage is concerned with creativity, on this stage, creativity-related skills play an important role. The level of mastery of creativity-related skills determines how inventively individuals approach problems and how imaginative and flexible their thinking is (Amabile, 1998). It depends on personality to a certain extent, as well as on an individual's thinking style and working habits. Creativity favours a flexible thinking style and perseverance in work (Amabile, 1998). A flexible thinking style enables a person to draw knowledge from different fields, combine it in an unorthodox way, or look at the problem from new original perspective. Perseverance allows persisting through a complexity of problem-solving and idea generating, which increases the chance of creative success.

On the implementation stage, creative skills can be of help too. However, implementation is more a social process that often requires the support of other people (Birdi, Leach and Magadley, 2016) and it relies heavily on the ability of individuals to develop a social relationship in order to get access to resources (Baer, 2012). The importance of social skills for successful idea implementation is recognized by many innovation researchers (Markham, 2002; Sternberg, 2006; Yuan and Woodman, 2010; Walter *et al.,* 2011; Baer, 2012; Magadley

and Birdi, 2012, among others). Social skills are skills that facilitate interaction and communication with other people (Baron and Markman, 2000). Social skills and related to them networking ability are strong boosters of individual innovation in an organization (Baer *et al.,* 2015).

Personality traits. Although the Personality traits category is not present in the Componential model of creativity, Amabile (1983) and other innovation researchers (e.g. Furnham and Bachtiar, 2008; Prabhu *et al.,* 2008) extensively discussed personality traits that are indicative of a creative individual. At the same time, Amabile (1983) pointed out that personality traits are not sufficient predictors of creativity in and of itself. Although they may often be found in individuals showing a propensity to generate creative ideas, personality traits are secondary to individuals' knowledge, skill, and motivation to create. That is why personality traits have not been included in the Componential model of creativity.

On the implementation stage, personality traits are taking a back seat too. In line with Amabile (1983), I assume that certain personality traits can be helpful in the implementation journey, but they can't substitute knowledge or social skills. Nevertheless, personality traits that are attributed by the authors to the implementation stage are widely mentioned in innovation literature and thus they are included in this study. Personality traits are defined as patterns of behaviour, thoughts, and emotions uniquely characterizing an individual (Kassin, 2003). Admittingly, personality traits pertaining to the generation stage are generally different from implementation-related personality traits, although certain overlaps occur.

4.3 Overview of factors

In this section, all factors allocated by the respective categories will be reviewed in order to clarify and justify their inclusion into IFII.

- Domain-related knowledge category

Job knowledge. Job knowledge refers to knowledge and technical expertise about the domain(s) where innovation takes place (Birdi, Leach and Magadley, 2016). Competent individuals can realize the idea in practice more expertly as they have a deeper understanding of underlying principles and nuances that allows to better navigate the implementation process and find solutions. Anderson, Hülsheger, and Salgado (2010) reported that job knowledge is strongly correlated with innovative job performance (cited in Potocnik, Anderson and Latorre, 2015).

It is implied in job knowledge that the individual has experience in the field. This experience is very much wanted in implementation because while it is possible to generate creative ideas without deep knowledge of the field implementation can be much harder to carry out without experience of how the work can be done in practice. Zennouche, Zhang and Wang (2014) stated that knowledge and expertise in the field are among the key factors facilitating innovation. Accordingly, Standing et al. (2016) considered that the more job knowledge and expertise individuals have the more they are equipped for successful implementation of innovation, though they add that besides knowing own area it is important to know other related areas, such as the situation on the market and consumer's psychology.

However, other researchers point out that too much job knowledge blocks innovation. Patterson, Kerrin and Gatto-Roissard (2009) reported that a U-shaped relationship between job knowledge and innovation has been established in a series of studies. It shows that too much job knowledge is as bad to innovation as too little job knowledge.

Operational skills. Operational skills refer to the competency of an individual to realize ideas in practice. However competent the individuals may be in their domain, their success in the implementation of ideas is dependent on how well they can organize work for turning an abstract idea into tangible result (Birdi, Leach and Magadley, 2016). Operational skills may include innovation-related planning as well as project, time, and change management that help the idea to reach its potential (Markham, 2002). Sternberg and Lubart (1996) stated that operational skills are a significant predictor of success in the context of innovation.

Wu, Melnyk and Flynn (2010) pointed out that operational skills or capabilities are often firm-specific. In their view, operational skills are skills gradually developed within the firm and used to solve firm-specific problems through the customized application of the firm's operational practices and resources. Very deeply ingrained into organizational structure, operational skills are tacit in nature and difficult to imitate. It underlines the importance of practical experience obtained by working and carrying out actual projects, in order to implement innovation in these specific settings. Authors articulate the importance of operational skills for implementation effort by giving an example: even the most talented chief coming to a new kitchen should first get used to how the kitchen operates and how the staff works together in order to organize his work in the most efficient way and start implementing new complex recipes successfully.

There is little research on the importance of operational skills for innovation implementation because operational skills are seeing as trivial generic skills and thus often get overlooked by both managers and researchers (Wu, Melnyk and Flynn, 2010).

Contextual knowledge. This factor concerns knowledge of the rules, values, and routines in the organization as well as how decisions are made, who knows what, and who can make

things happen (Sternberg, 2006). Contextual knowledge allows seeing the organization as a system of circulating information and helps to define where useful information or expertise can be drawn from (Da Silva and Davis, 2011). Howell and Boies (2004) contended that contextual knowledge is instrumental in promoting innovative ideas on the way to their implementation. It includes an integrated understanding of organizational strategy, motivations of key decision-makers, organizational capabilities (what an organization can do and how it can do it), and formal/informal norms and behaviours accepted in the organization. All these aspects play an important role in the promotion (championing) of the innovative idea.

Using the analogy with kitchen in the restaurant, contextual knowledge can help the chief to understand who makes decisions about introducing a new recipe into the menu, who can help with obtaining ingredients or provide necessary culinary expertise, who he can talk to in order to ensure support for his new recipe idea as well as how to wrap his new recipe the way it will be well suited and accepted by the restaurant administration and customers based on the values, rules, and atmosphere in the given restaurant.

However, Sternberg (2006) warns that contextual knowledge alone is not enough for the successful implementation of the idea. Powerful contextual knowledge without domain-related knowledge can lead to the acceptance of an idea just because it is smartly presented and not because it is actually a good idea. A combination of strong contextual knowledge and weak operational skills bears the danger that well-accepted ideas provided with support and resources will fail because of poorly carried out implementation.

- Motivation category

Intrinsic motivation. It is “a motivational state generated by the individual's reaction to intrinsic properties of the task” (Amabile, 1983, p.365). Intrinsic motivation comes from within and is sparked by an individual’s innate interest, passion for the topic, and desire to find a solution. On the idea generation stage, motivation clearly concerns only intrinsic motivation (Amabile, 1983). Amabile (1983) even suggests that intrinsic motivation is by far the most important individual-level factor promoting creativity as without proper motivation the individuals will not utilize their knowledge and creativity skills whatever advanced they may be. Amabile (1998) asserts that intrinsic motivation is a far more powerful driver of creativity than extrinsic motivation, motivation coming from external sources such as money or promotion.

On the idea implementation stage, as argued by Birdi, Leach and Magadley (2016) intrinsic motivation is even more valuable asset because idea implementation is viewed as a more challenging process than idea generation, and as such, it demands more motivation. Often new ideas face resistance. High intrinsic motivation helps the individuals persist through this

resistance while moving their idea forward. Apart from that, intrinsic motivation can contribute to the willingness to engage in innovation in the first place. Patterson, Kerrin and Gatto-Roissard (2009) name intrinsic motivation the most important driver of innovation on the individual level.

Extrinsic motivation. Extrinsic motivation stems from external motivational factors such as money, career promotion, or reputational benefits. On the idea generation stage, extrinsic motivation received mostly negative reviews from the researchers. As mentioned by Amabile (1998), during the idea generation process, extrinsic motivation can have a detrimental effect on creativity, particularly if it is perceived as controlling by individuals. They can either feel that they are pushed to generate ideas or start to produce many shallow ideas just for the sake of reward. In line with Amabile, Cognitive evaluation theory states that external rewards such as money or career benefits are detrimental for creativity as they diminish the intrinsic motivation of employees and increase their feeling of being controlled by the promise of reward (Byron and Khazanchi, 2012).

As opposed to the idea generation stage, on the implementation stage, extrinsic motivation plays a significant role as implementation requires an additional effort that individuals would like to be rewarded for (Baer, 2012). Patterson, Kerrin and Gatto-Roissard (2009) added that external rewards encourage the individual to persist under pressure and difficulties associated with the implementation of ideas. Sauermann and Cohen (2008) noticed that both intrinsic and extrinsic motivation enhance innovation, though extrinsic motivation has less impact than intrinsic motivation.

- Social skills category

Influence behaviours. In order to implement a creative idea, it is very important to persuade the decision-makers in the organization that the idea is worth putting resources in. And the more creative idea is the more resistance it usually meets (Baer, 2012), so more persuasion effort is needed. In order to be successful in pushing the idea forward, the individuals should exhibit behaviours that allow them to effectively “sell” the idea and acquire necessary resources and support (Axtell *et al.,* 2000). Influence behaviours are the behaviours that are based on tactics helping the individual surmount criticism and possible resistance and persuade decision-makers to allocate resources and support for idea realization (Perry-Smith and Mannucci, 2017).

Influence behaviours can employ various tactics in order to reach their goals (Anderson and Bateman, 2000). Rational persuasion, which includes the use of logical arguments and solid facts, is usually directed at superior decision-makers in order to acquire sponsorship. Coalition

building is targeted at peers in order to ensure the support of knowledgeable or otherwise valuable peers. Influencers can also use inspirational appeal, a powerful way to appeal to the decision-maker's values and motivations in order to gain his support for a new project. Markham (2002) considers influence behaviours to be pivotal in promoting creative ideas throughout their implementation.

Ability to network. As implementation is a social process, it depends heavily on the support and contribution of other people. While individuals are building connections at work or outside, they create their own network that can facilitate for them access to resources, secure sponsorship, and acquire advocacy (Baer, 2012). Patterson, Kerrin and Gatto-Roissard (2009) posited that having access to a relevant network usually greatly facilitates the acquisition of information, expertise, and resources possessed by the members of this network. Networking is particularly important in international and interdisciplinary projects where it is necessary to draw knowledge from different domains, different industries, or different geographic locations.

Networking ability is defined as "an extent to which people are skilled in developing and using social networks to effect change at work" (Baer, 2012, p. 1106). Networking ability includes the ability to involve others, develop relations and forge coalitions not only for accessing resources but also for influencing opinions of decision-makers. Baer (2012) in his research provided evidence that good networking ability has a positive effect on the implementation of creative ideas. Markham (2002) posited that networking skills and contact management are highly desirable for idea champions in order to better promote novel ideas.

Communication skills. The innovation process, particularly its implementation part, is founded in the interaction between individuals (Patterson, Kerrin and Gatto-Roissard, 2009). Communication skills enable individuals to efficiently communicate with others and also successfully convey their vision, opinions, and suggestions in order to move the ideas forward (Birdi, Leach and Magadley, 2016). Good et al. (2007) considers communication skills to be highly beneficial for the implementation of innovation.

As in the case of influence behaviours, communication skills help to overcome resistance to the creative idea and aid its implementation (Howell and Boies, 2004). Also, positive communication among individuals unites them and enables them to perform their tasks more efficiently (Skerlavaj *et al.,* 2017). Within the organization, a proper communication system allows to exchange and spread ideas, which creates an environment where ideas thrive, multiply and have a higher chance to be translated into action, which benefits their implementation (Jong, 2007).

Issue presentation. An idea should be presented smartly in order to gain attention and acquire advocacy. Andersson and Bateman (2000) explain that proper issue presentation can bring

out the importance of the issue and emphasize its beneficial aspects the way that the issue is perceived in the most attractive light by the decision-makers and is more likely to gain the necessary support.

Issue framing is the first step in issue presentation. Issue framing allows representing the issue in a way that the best understood and accepted by the organizational stakeholders. For this purpose, issue-framing dimensions such as opportunity/threat or financial gain can be used. The second step, presentation of the framed issue, is aiming at presenting the idea in a particular manner in order to effectively "sell" the idea to decision-makers and ensure sponsorship (Andersson and Bateman, 2000). For that certain linguistic techniques as well as presentation and acting skills can be used to give life and colour to the issue.

Howell and Boies (2004) suggest that contextual knowledge can facilitate issue presentation as it helps to figure out how to better appeal to the values and strategy of the administration in an organization. Also, they mention that for idea presentation informal idea champion would be more beneficial than a formal one (assigned person) because an informal idea champion will come across as more genuine. Markham (2002) states that writing of convincing business case presenting the issue in attractive details is one of the most important skills that an idea champion should have. Effective presentation of a well-written business case can ensure that it is rated high by the decision-makers.

Legitimacy. Legitimacy is another attribute of the idea champion. Legitimacy is a reputational factor that is based on the individual's performance and competence in the domain where innovation takes place as well as a perceived ability to implement an idea. Legitimacy can be own, earned as a result of personal achievements, or borrowed when the legitimacy of an individual is reflected by the number of highly reputed contacts the individual has. Individuals with higher legitimacy are more likely to be granted approval, resources, and support by decision-makers (Perry-Smith and Mannucci, 2017).

Legitimacy is a factor that reflects the perceptions of other people and is earned over time. If the individual is new to the team his or her legitimacy will be perceived as marginal even if the individual is actually very knowledgeable about the field. Legitimacy is based either on performance and reputation in the field where innovation takes place or on the record of prior successes in implementing innovation. It makes it safe to assume that the individual perceived as having legitimacy should have a long period of widely recognized successful activity in the field.

- Personal traits category

Self-efficacy. Self-efficacy refers to “the beliefs in one’s capabilities to organize and execute the courses of action required to produce desired results” (Bandura, 1997, p. 3). It is worth noting that these beliefs may not correlate with the number of skills that the individual has but rather with internal believes about own ability to perform well under different circumstances. Self-efficacy can be enhanced by previous successes or achievements of other people in similar tasks or encouragement coming from a respected person (Siregar, Suryana and Senen, 2019). Self-efficacy promotes enthusiasm and confidence about the success of innovation and helps the individual to persist under adversity (Howell et al 2005). Individuals with high self-efficacy are more readily engage in activities and do not give up even when facing obstacles and resistance (Da Silva and Davis, 2011), which is important for the challenging endeavour of idea implementation.

Self-efficacy is widely mentioned in innovation literature and often associated with proactive personality and motivation to engage in innovative behaviours (Potocnik, Anderson and Latorre, 2015). Houghton, Neck and Manz (2003) suggested that higher self-efficacy improves performance. Some researchers attribute it to creativity and idea generation stage of the innovation process (e.g. Meinel *et al.,* 2019), while other perceive it as an influencing factor for innovative work behaviour (e.g. Siregar, Suryana and Senen, 2019) and a characteristic that facilitates idea implementation (e.g. Jong, 2007).

With regard to other factors in IFII, the research shows that self-efficacy positively influences motivation (intrinsic motivation) and increases the level of commitment (Siregar, Suryana and Senen, 2019). Besides, self-efficacy is linked to innovative job performance construct, which is also related to proactive personality trait (Potocnik, Anderson and Latorre, 2015).

Proactive personality. Proactive personality as a trait refers to a disposition of the individual to initiate change (Potocnik, Anderson and Latorre, 2015). It also indicates that the individual is not just reactive to events but anticipates opportunities or problems and prepares to act on them before they actually come (Patterson, Kerrin and Gatto-Roissard, 2009).

A proactive personality is viewed as self-starting (acting on own accord and motivation) and persistent (persisting under adversity) (Parker, Williams and Turner, 2006). Proactive personality is associated with such concepts as personal initiative and voice behaviour (Patterson, Kerrin and Gatto-Roissard, 2009). Personal initiative is behaviour the individuals exhibit when they willingly take charge and shoulder responsibility. Voice behaviour is expressed in the willingness of the individual to openly suggest change (Van Dyne and LePine, 1998).

Research shows that proactive personality is a predictor of idea implementation (Patterson, Kerrin and Gatto-Roissard, 2009; Binnewies and Gromer, 2012). Jong (2007) classified

proactive personality as one of the antecedents of individual innovation. Potocnik, Anderson and Latorre (2015) connected proactive personality to extraversion suggesting that sociable and outgoing individuals show more proactivity in trying something new. They also found that proactive personality as a construct can be used in HR practices for selecting candidates with innovative potential.

Need for achievement. This trait is characteristic of the individuals who are particularly interested in achievement where their abilities are an instrumental factor for solving the issue (Roffe, 1999). Roffe (1999) pointed out that achievement can be an important motivator for innovators who through successes in innovation satisfy their personal, financial, or career aspirations. He also specifies that recognition of achievement for innovators is a much stronger incentive than money.

Cerinsek and Dolinsek (2009) enlisted the need for achievement or ambitiousness as one of the underlying individual characteristics influencing innovative behaviour. Ngah and Salleh (2015) mentioned achievement-orientation as indicative of entrepreneurial innovativeness. The need for achievement is related to conscientiousness as it partly explains why conscientious people put so much effort and time into diligently doing their work (Yesil and Sozbilir, 2013).

Risk tolerance. Idea implementation is associated with high risks and uncertainty because the success of innovation is difficult to predict (Yuan and Woodman, 2010). Individuals engaged in the implementation of innovation and thus exposed to risks develop special plans aiming at assessment and reduction of risks. But even having these plans does not always help. Therefore, innovation implementors should be internally prepared to face a risky situation and have enough character strength and internal confidence to tolerate ambiguity. Without these character traits, they can potentially be hurdled by challenges of the implementation process that can far exceed their intrinsic motivation to succeed.

Risk tolerance is the ability of an individual to take risks associated with innovation and learn from failure (Standing *et al.,* 2016). This ability is often attributed to successful entrepreneurs who are not afraid to take risk and even enjoy it at times (Ngah and Salleh, 2015). Shalley, Zhou and Oldham (2004) attributed risk tolerance to individuals with innovative cognitive style. Yuan and Woodman (2010) reported that perceived risks have a negative effect on individual innovativeness, which underscores the importance of risk tolerance for idea implementation.

Emotional intelligence. Emotional intelligence is an emerging topic in the context of innovation and entrepreneurship. It is considered to be highly relevant not only for innovation success but for high performance in any field and even in life outside the work (Zhang *et al.,* 2015). World Economic Forum (2020) in their The Future of Jobs Report showed growing importance

of emotional intelligence in the top 10 skills that are named as highly important for individuals during the Fourth Industrial Revolution that is happening now (Fig. 13).

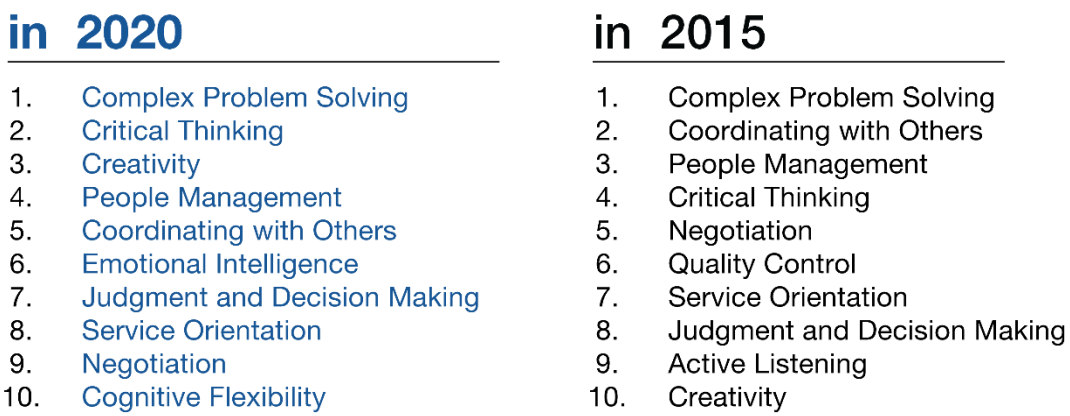


Figure 13. Top 10 skills that are necessary in order to be successful in the Fourth Industrial Revolution (World Economic Forum, 2020)

Emotional intelligence is defined as “an ability where people regard their own emotions and the emotions of other people as bases for framing their relationship with others” (Ngah and Salleh, 2015, p.452). Emotional intelligence has four dimensions: the ability to perceive emotions, understand emotions and manage them, and use emotions to aid thought and decision-making process (Mayer, Salovey and Caruso, 2004). All of these dimensions prove to be important in the development of good social relationships with people, establishing cooperation and maintaining an emotionally safe atmosphere in workplace (Ngah and Salleh, 2015).

Emotional intelligence has a positive relationship with the individual’s innovativeness (Ngah and Salleh, 2015). Emotional intelligence helps to manage conflicts and maintain a healthy relationship with individuals that facilitates access to their knowledge, expertise, and resources, which is an important part of the idea implementation process. Zhang et al. (2015) connect emotional intelligence with successful entrepreneurship. They view emotional intelligence as an important facilitator in such entrepreneurial activities as social interactions, resource management, and exploitation of opportunities. Emotional intelligence help entrepreneurs to make a more rational judgment as they are in control of their emotions, and better connect to partners and consumers’ needs and wants that is highly beneficial for innovation implementation (Fukuda, 2013).

Conscientiousness. Conscientiousness is a trait of being diligent, dedicated, committed and hard-working (Roffe, 1999), which is important during idea implementation (Potocnik,

Anderson and Latorre, 2015). A conscientious individual will think before acting, plan carefully in advance, prioritize and follow the guidelines accurately in order to ensure the events run as needed (Witt, 2002). McCrae et al. (1999) posited that conscientiousness in individuals is associated with self-discipline and a tendency to make long-term plans and organize aspects of life including those aspects related to finding support and resources. These individuals are more prone to take initiative, shoulder responsibility, and put an effort into accomplishing assigned duties, which makes them ideal candidates for successful conducting of implementation activities. Where other individuals give up under possible failures, a conscientious individual will diligently persist until success is achieved that makes conscientiousness a mark of potential innovation implementor (Wang *et al.,* 2012).

Witt et al. (2002) also connect conscientiousness with high job performance through such construct as job dedication, which is defined by following rules, taking responsibility, being diligent, and ready to take an initiative. Apart from diligent fulfilment of duties, conscientiousness has a facilitating influence on interpersonal relations. Conscientious individuals are characterized by a tendency to listen and adhere to what is important to others and by their respect to a social protocol that makes them come across as sensitive and cooperative (Witt and Ferris, 2003).

Although many researchers consider conscientiousness to be beneficial for idea implementation, in other studies conscientiousness received mixed evidence. Patterson et al (2009) posited that according to recent research, conscientiousness is negatively associated with innovation as conscientious individuals are more resistant to change and more prone to maintain the status quo. Potocnik, Anderson and Latorre (2015) found that conscientiousness has little importance for innovative job performance. Yesil and Sozbilir (2013) reported mixed findings on conscientiousness and innovation. So, it leaves the question on the fit of this factor to IFII open and it is stated that additional research in this direction should be made.

Extraversion. Extraversion is a characteristic trait ascribed to outgoing and social individuals. It is indicative of a propensity to try out new ideas (Potocnik, Anderson and Latorre, 2015) and beneficial for finding support for idea implementation (Kumar and Bharadwaj 2016). Whereas introversion is more beneficial for idea generation (Patterson, Kerrin and Gatto-Roissard, 2009), extraversion benefits those who need to introduce these ideas to decision-makers and put them in action (Kumar and Bharadwaj, 2016). Extraverts are characterised by their readiness to socialize with people, mastery in communications, self-confidence and active personality (Bakker *et al.,* 2006). All of this is necessary for successful idea implementation as it rests on social support and communication. As Patterson, Kerrin and Gatto-Roissard

(2009) noticed innovation does not happen in a vacuum but is an outcome of the interaction between individuals both inside and outside the organization.

Self-confidence. Self-confidence is a trait making the individual value herself and believe in her ability to perform well. Confident individuals are more inclined to challenge the status quo and initiate change (Potocnik, Anderson and Latorre, 2015). Baer et al. (2015) state that confidence creates necessary conditions in which individuals are sharing and pursuing their ideas more readily, which not only strengthens cooperation within a network but also contributes to their propensity to successfully implement ideas in practice.

Cerinsek and Dolinsek (2009) enlist self-confidence as one of the necessary traits indicating innovation competency. On their innovation competency radar chart, apart from self-confidence they also place motivation and ambitiousness. In this way, it indicates a connection of self-confidence with such factors as intrinsic motivation and need for achievement pertaining to IFII. Clegg et al. (2002) connect self-confidence with self-efficacy and proactive personality and propose that all mentioned traits are necessary for innovation implementation in the workplace. Self-confidence is one of the traits in IFII that is important both on idea generation and idea implementation stages of the innovation process.

However, Walter et al. (2011) warn that over-confidence can pose danger to idea implementation because it can turn into excessive optimism and result in overlooking possible dangers and wrong paths that implementation can take.

Commitment. It is a quality of being dedicated to a chosen course of action. Commitment ensures that the individual will persist in overcoming pressures and adversity related to idea implementation and bring it to successful fruition (Howell and Boies, 2004). Idea champions demonstrating commitment get their idea accepted and implemented more often (Howell, Shea and Higgins, 2005). Showing personal commitment, particularly in the situation of uncertainty, which often follows implementation process, serves as an indicator to stakeholders and decision-makers that the idea is reliable, well-thought and deserves their commitment too (Walter *et al.,* 2011).

Apart from personal commitment, it is necessary to build the commitment of others for successful idea implementation, which is also one of the actions attributed to championing behaviours. Personal commitment aids this process by enticing feelings of safety and reliability of a new idea in involved stakeholders.

Openness to experience. Openness to experience is another trait attributed both to idea generation and idea implementation stages of the innovation process. Openness to experience is a personality trait closely associated with intelligence and curiosity, which

indicates an individual's inclination towards novelty. It is predictive of individual innovation (Patterson, Kerrin and Gatto-Roissard, 2009). According to innovation studies, openness to experience contributes to an individual's intrinsic motivation to try out new things and in this way to engage in innovation activities more readily.

Although some researchers assume that relationship between openness to experience and innovation is dependent on the context (e.g. Baer and Oldham, 2006), openness to experience is named as one of the most important personality traits indicating innovation potential in the individual (e.g. Patterson, 2002). Potocnik, Anderson and Latorre (2015) stated that the evidence of the correlation between openness to experience and individual innovation throughout innovation research is so strong that it can be used by HR for selecting candidates with innovation podetial.

5 RESULTS

In this section, the outcomes of a structured literature review and how it was translated towards building IFII will be discussed in order to outline coverage of the Framework in terms of individual-level factors pertaining to idea implementation, indicate well-studied and overlooked factors, and set the directions for future research. Further, the results of expert validation and their comments on factors' relevance and definitions will be discussed.

5.1 Results of structured literature review

As mentioned in section 4.3 Overview of Factors, not all factors found in the literature received an even amount of attention from the innovation scholars. The heatmap in Figure 14 shows the results of the structured literature review regarding how often the factor has been mentioned. The intensity of the orange colour indicates the intensity with which the factor has been discussed in the analysed literature. To address the limitation that analysed literature includes only 38 articles it can be pointed out that analysed articles were obtained in a randomized way, within the recent period, and using relevant keywords that make this small scope of literature to be representative of the current state of implementation research.

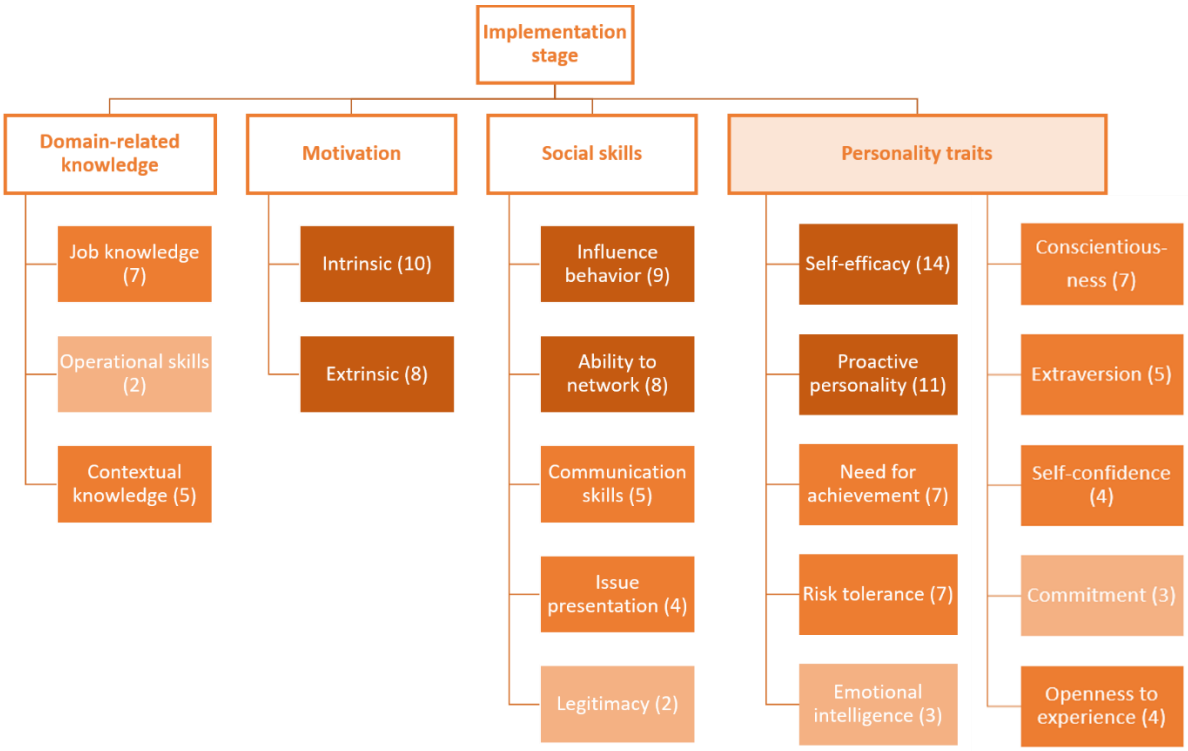


Figure 14. Heatmap of IFII based on structured literature review

In Figure 14, it can be seen that some factors have been well-covered in the implementation literature (e.g. self-efficacy and influence behaviour) and some have rather been overlooked (e.g. legitimacy and operational skills), which helps to identify some of the possible areas for future research.

The personality traits category seems to be the most researched one that can be attributed to the massive interest of innovation scholars to psychological aspects of an innovative person, and also to the fact that more than half of analysed articles came from Psychology-related domains. Admittingly, the personality research in creativity and innovation has a long history and includes such famous personality theorists as Freud, Jung, Maslow, and Rank, who made a profound contribution to creative and innovative personality research.

The social skills category is relatively well-presented due to the fact that most if not all analysed authors underscore the importance of social skills in innovation implementation (some of them – in the innovation process in general). Influence behaviours and networking ability are particularly well discussed as they are the most acknowledged attributes of idea championing. Legitimacy, which to my understanding goes hand in hand with influence behaviours, did not receive enough attention due to the fact that it is still not well-recognized as a construct separate from influence behaviours and there are no quantitative studies (at least within the scope of analysed literature) on the relationship between legitimacy and innovation implementation.

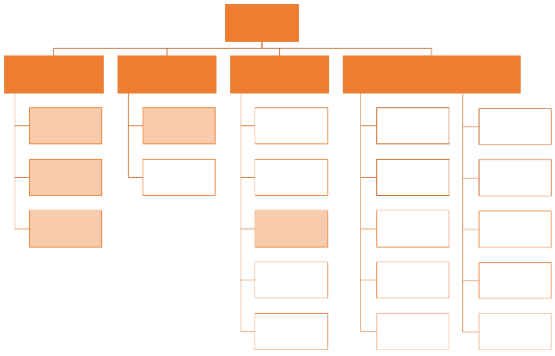
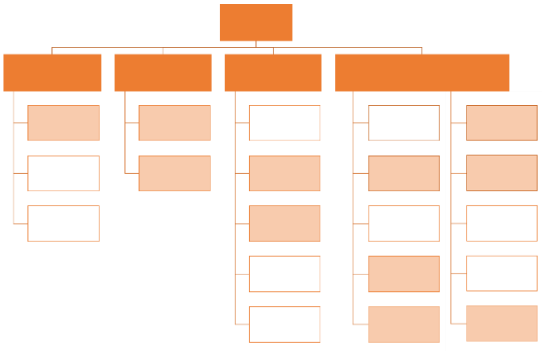
The motivation category is covered well due to the well-established position of intrinsic motivation in innovation and particularly in the idea generation processes (e.g. in Amabile's research). Motivation has been studied very thoroughly and recognized as a powerful driver of creativity and innovation. Intrinsic motivation as a factor received the general agreement from the scholars. There was no article containing negative or mixed evidence related to the role of intrinsic motivation in the idea implementation. As for extrinsic motivation, on the idea generation stage, it was mostly designated as a detrimental factor inhibiting creativity. However, on the idea implementation stage, extrinsic motivation has been recognized as an important factor promoting the idea implementation process. The positive influence of extrinsic motivation in a form of monetary or career-boosting rewards has been generally accepted in all analysed articles.

Domain-related knowledge remains to be the least covered by the literature, although in my opinion it is as important to innovation implementation as the corresponding category in the Componential Model of Creativity (Amabile, 1983) is important for creativity. It is hardly possible to implement innovation properly if the topic of innovation is unclear or poorly understood by the innovation implementers, or if they do not know how to manage the

implementation process and align it well within the organizational context. The lack of research can be explained by the fact that knowledge necessary for the implementation process has been viewed as trivial, generic, and firm-specific knowledge that is not worthy of academic research (Magadley and Birdi, 2012). However, this negligence can result in misconception about the innovative individual that good social skills, motivation, and the right set of personality traits are enough for successful implementation of innovative ideas in organizations.

Although no other frameworks similar to IFII have been detected in the analysed literature, a number of researchers made laudable attempts to summarize the individual-level factors helping to promote innovation on the idea implementation stage. Table 6 contains the most comprehensive sets of individual-level factors (marked light orange) identified during the structured literature review. It is worth noting that in the mentioned articles, the identified sets of factors have not been structured according to categorization accepted in this study: either they have not been categorized at all or they followed different categorization principles.

Table 6. Comparison of IFII against identified sets of factors attributed to the implementation stage of innovation process by other authors

Authors	Covered factors
Birdi, Leach and Magadley, 2016	
Patterson, Kerrin and Gatto-Roissard, 2009	

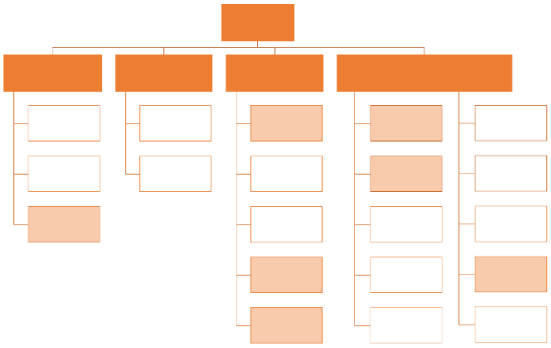
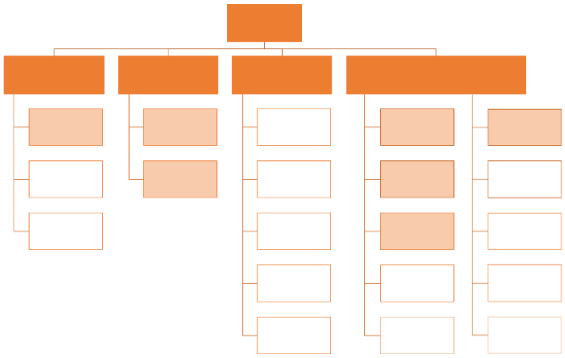
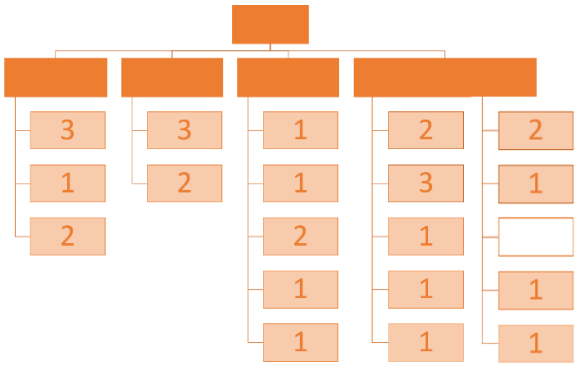
Howell and Boies, 2004	
Zennouche, Zhang and Wang, 2014	
Aggregation of all mentioned sets of factors with indication of the frequency of factor occurrence	

Table 6 provides further insights into how much of the idea implementation research on individual-level was captured by IFII. This table shows which factors have been discovered by the most comprehensive (in terms of scope) previous studies. Other studies in the analysed literature, not mentioned in the Table, have addressed smaller constellations of individual-level factors promoting innovation on the idea implementation stage. It should be mentioned that in Table 6 factors were considered as covered (marked light orange) even if the author(s) only briefly mentioned them in their work. The same is true for all other articles used for building IFII.

Some authors like those included in Table 5 have made a comprehensive overview of individual-level factors that are indicative of innovation potential. Some other authors were focusing only on one category (e.g. championing) (Skerlavaj *et al.,* 2017) or separate factors (Baer *et al.,* 2015). It can be added here that most of the authors studied more than one category of factors but almost never all categories together – the issue addressed in IFII. One exception is Patterson, Kerrin and Gatto-Roissard (2009) although the authors did not make any attempt to categorize the factors and not all factors included in IFII were mentioned by them.

In order to warrant comprehensiveness of the framework and ensure that there is at least some relation between the factors, during the articles selection process preference was given to the articles mentioning more than one factor relevant to the topic. Once validated, IFII will represent the fullest collection of individual factors promoting innovation during idea implementation. Feedback of experts validating IFII will be discussed in the next section.

5.2 Results of expert validation

Out of 28 approached experts, a total of 12 experts from academia participated in the expert validation of IFII, which shows a good response rate of 42,9%. The response rate could be potentially higher if the survey period could have been extended for longer than two weeks. The two-week duration of the survey is explained by the temporal constraints of the master's thesis period. Expert information is presented in Figure 15 as infographics.

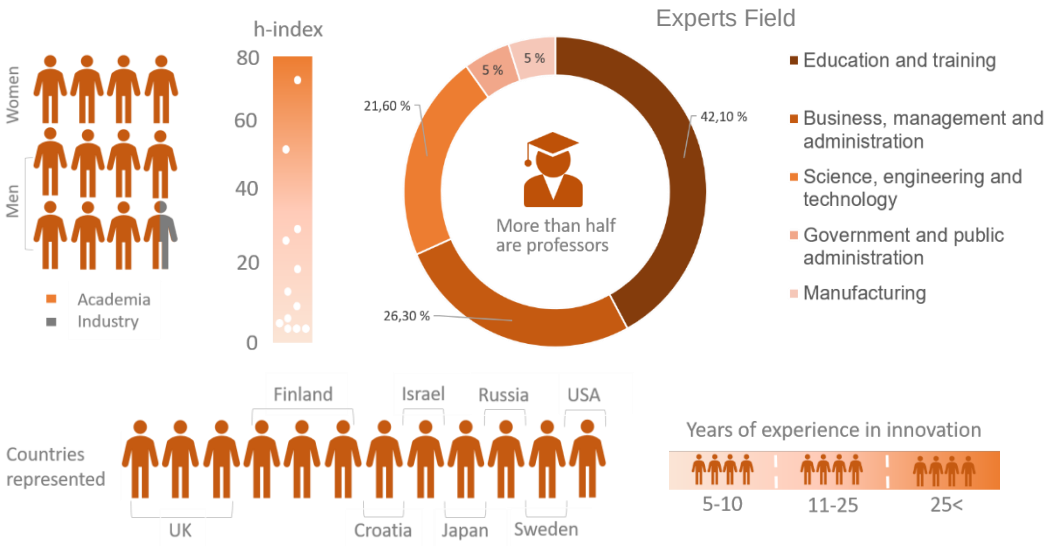


Figure 15. Expert information infographics

Research quality evaluation

First, the experts were asked to express their opinion on the clarity and relevance of the research idea. Most researchers evaluated it highly. The responses ranged from “overall good” to “research is very clear and relevant”. The responses to the next question on the quality of research design revealed that the research design was perceived as quite clear and relevant to the research aims. The limitations suggested in research were also perceived as adequate and valid.

These questions, though not directly related to IFII validation, helped to evaluate if the research was properly explained to and understood by the experts, which enhanced the reliability of the responses for IFII validation.

Categorization ranking

The responses for ranking the relevance of categories revealed that most of experts agreed with proposed categorization (Fig. 16). Their responses are allocated according to five-point Likert scale (Axis X) used in the questionnaire (0 – Not relevant, 5 – Relevant). The final grade was calculated based on percentage of experts who selected corresponding option. For example, 75% of experts marked Domain-related knowledge category as Relevant to IFII and 25% of experts marked it as Quite relevant. This was translated into the grade with relative weight on five-point scale for the Domain-related knowledge category (Fig. 16).

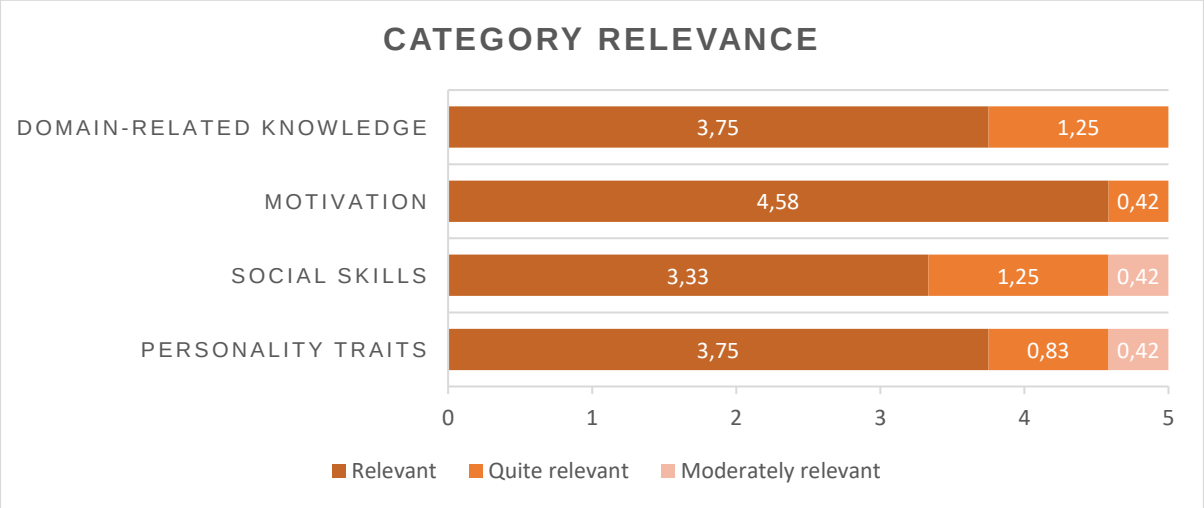


Figure 16. Expert opinions on the relevance of each category for IFII

Relevance. Figure 16 shows that the majority of experts have considered all categories to be Relevant or Quite relevant to the case of IFII. Motivation category gained the fullest agreement among the respondents. Social skills and Personality traits categories raised some doubts. As

one expert noticed: “Social skills and personality traits don't seem crucially important to me for idea implementation unless the implementation is conditioned (gated) by other individuals in an organization”. It is a legit remark because theoretically innovation in an organization can be implemented by one single specialist. However, support and involvement of other people are required for most cases observed in the analysed articles while building IFII, so the importance of these categories for the majority of cases of innovation implementation in organizations is corroborated by the literature (e.g. Howell and Boies, 2004; Baer, 2012; Standing *et al.,* 2016). Some experts mentioned the importance of previous experience, which is not present here. However, as presented later in this section, the experience is implied in the factors pertaining to the Domain-related knowledge category.

Definitions. Accuracy of the category definitions mostly found consent among experts (75-92% of experts indicated strong agreement with the definitions). Domain-related knowledge received the least agreement from the expert (only 66,7% of experts agreed fully, and 33,3% somewhat agreed). One expert noted that: “Since the Domain-related knowledge include also background and context knowledge strictly it is actually broader than mere domain-related knowledge”. This remark is valid. Accordingly, the name of the category can be changed to Expertise, which is broader and implies that apart from knowledge in the domain it also includes necessary expertise as well as knowledge about organization and implementation practicalities.

Another expert observed that: “With Personality traits category, I think it needs to be said the traits are reasonably stable over time”. I agree that this notion can be added to the definition. However, it requires an additional research to identify which of the mentioned personality traits are stable and which can change over time, which is outside of the scope of this study.

Factors ranking

In the ranking of factors pertaining to each category, there was noticeably less agreement among the experts. It can be explained by the fact that the definitions that the experts referred to in the questionnaire in order to make their judgment have been intentionally made very concise. On the one hand, it saved time for the experts but on the other hand, it to some extent affected their understanding of each factor, at least in a few cases, as can be assumed from some qualitative responses. This observation will be considered for future research.

- Domain-related knowledge category

Relevance. Operational skills factor is found to be the least relevant factor in this category (Figure 17). Although the experts did not mention why this factor raised their doubt, operational skills seem to be the factor that is the least recognized by the innovation research community.

This fact was brought up by Wu, Melnyk and Flynn (2010) who lamented the lack of research on the importance of operational skills for innovation implementation. According to them, it happened because operational skills are viewed as trivial generic skills and thus often get overlooked by both managers and researchers.

One of the experts pointed out the importance of including tacit knowledge in this category. It can be commented here that although tacit knowledge was not discussed much in the analysed literature, it is implied in all factors in this category as the importance of experience and strong position of the person in organization where innovation is implemented was definitely underlined (e.g. Perry-Smith and Mannucci, 2017). However, it is an important note to consider as tacit knowledge is often mentioned in the literature in context of innovation.

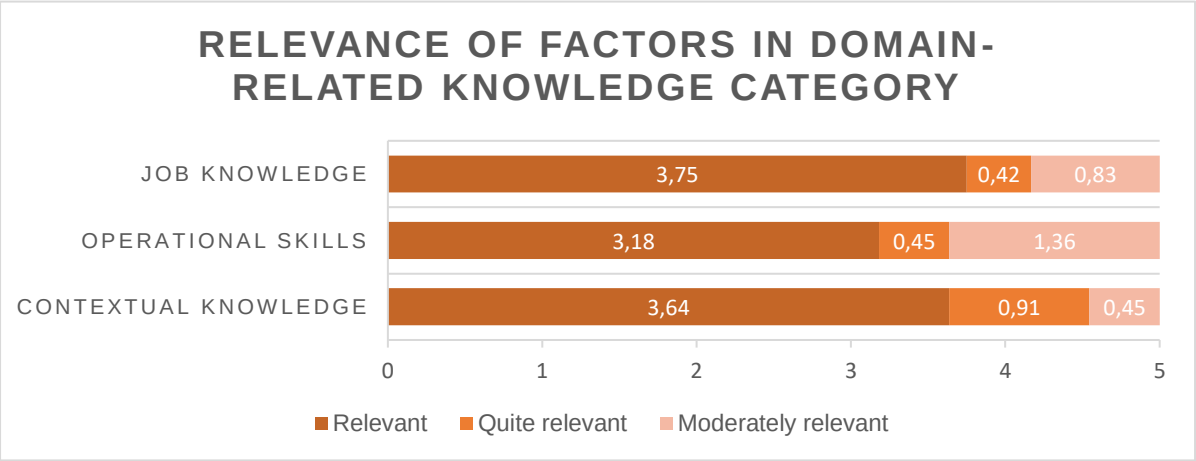


Figure 17. Expert opinions on the relevance of factors pertaining to Domain-related knowledge category

Definitions. Some agreement has been achieved in the section with definitions to these factors (50-67% of expert strongly agreed with proposed definitions and 25-33% somewhat agreed). According to qualitative explanations, certain doubt appeared because some experts did not agree with the name of the factor (and not with its definition). For example, one expert observed: “Contextual knowledge seems to be close to knowing the norms and rules, and I am not sure that the name is the best here”. Another one added: “Job knowledge - I agree with the definition, but not with the factor name. It seems somehow misleading. Usually job title is much broader than the actual domain where the person is working”. In addition, one expert commented that “These three factors seem to be somehow overlapping. For instance, "understanding of underlying principles and nuances" (Job knowledge) and "knowledge of the rules, values and routines in the organization as well as how decisions are made" (Contextual knowledge) seem to be similar”. This confusion can be caused by the conciseness of definitions. For these factors, it was decided that for future research in this area it will be

necessary to revise the definitions and make them more detailed, as well as propose more suitable names for the factors.

Importance. Questions about importance of the factors attempted to investigate the practical relevance of the studied factors for innovation-intensive industry. Approximately 80% of academic experts found all three factors to be important or at least quite important. A few experts suggested that experience in innovation implementation would be another important factor necessary for individual in order to properly implement innovation in organization. However, if we turn to the elaborated versions of descriptions of the domain-related factors in this study, it will become evident that a successful record of innovation implementation is implied in all three factors. So, it is not necessary to bring the experience out as a separate factor.

- Motivation category

Relevance. The factors in this category are perceived as relevant by most experts (Fig. 18). It can be explained by generally high recognition of the motivation factor as a driver for innovation by the innovation researchers. Consistently with the literature (Patterson, Kerrin and Gatto-Roissard, 2009; Baer, 2012), the experts agree that extrinsic motivation is quite as relevant for innovation implementation as intrinsic motivation. Accordingly, Sauermann and Cohen (2008) noticed that both intrinsic and extrinsic motivation enhance innovation, though extrinsic motivation has less impact than intrinsic motivation.

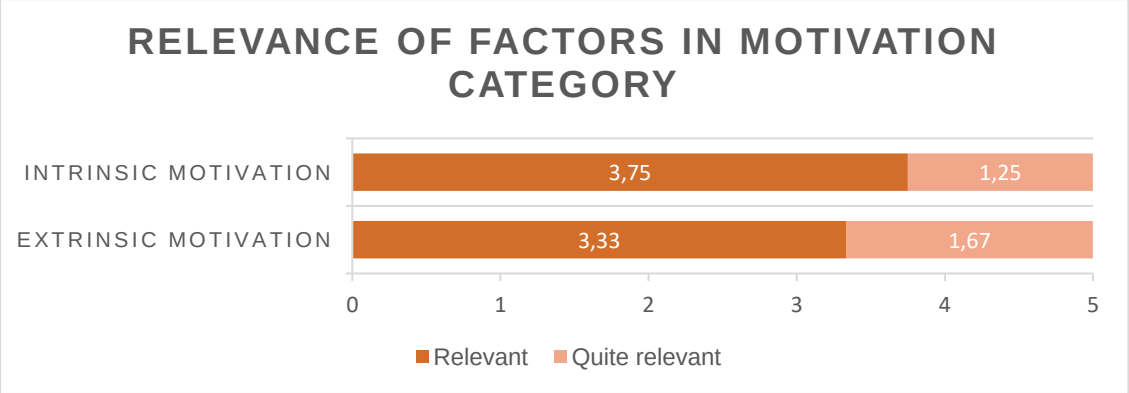


Figure 18. Expert opinions on the relevance of factors pertaining to Motivation category

Definitions. The experts also agreed with the definitions of intrinsic and extrinsic motivation (75% of experts agreed with the definition of intrinsic motivation, 83,3% - with the definition of extrinsic motivation). One expert pointed out that: “With extrinsic motivation, you could also add avoiding punishment or sanction as an external motivator. You might implement something because you would be adversely affected if you did not”. It is a legit remark and it

should be added to the definition of extrinsic motivation in future, which will enhance its accuracy.

Importance. Surprisingly, less than half of the experts recognized the extrinsic motivation factor as important for the individual employed in the innovation-intensive sector. One expert observed: “I feel that intrinsic motivation can substitute extrinsic motivation, at least to some extent”. Another expert added that extrinsic motivation is less powerful than an intrinsic one. It can explain the mentioned results. Intrinsic motivation has been recognized as important by 75% of experts.

- Social skills category

Relevance. Factors in this category have been recognized as having a higher level of relevance than other factors (Fig. 19). It is consistent with the literature placing a special emphasis on the importance of social skills for the idea implementation stage (Baer, 2012). Among other Social skills category factors, the legitimacy factor received the least approval. One expert noted that it is hard to comprehend how legitimacy can play a big role in innovation process. He also mentioned that he never met this factor in the innovation literature. This is easy to explain as legitimacy is the least researched factor in this category. As it was mentioned, only a few researchers recognized it as a factor separate from influence behaviour factor. It also indicates that this factor requires more research in order to be recognized by the experts in future.

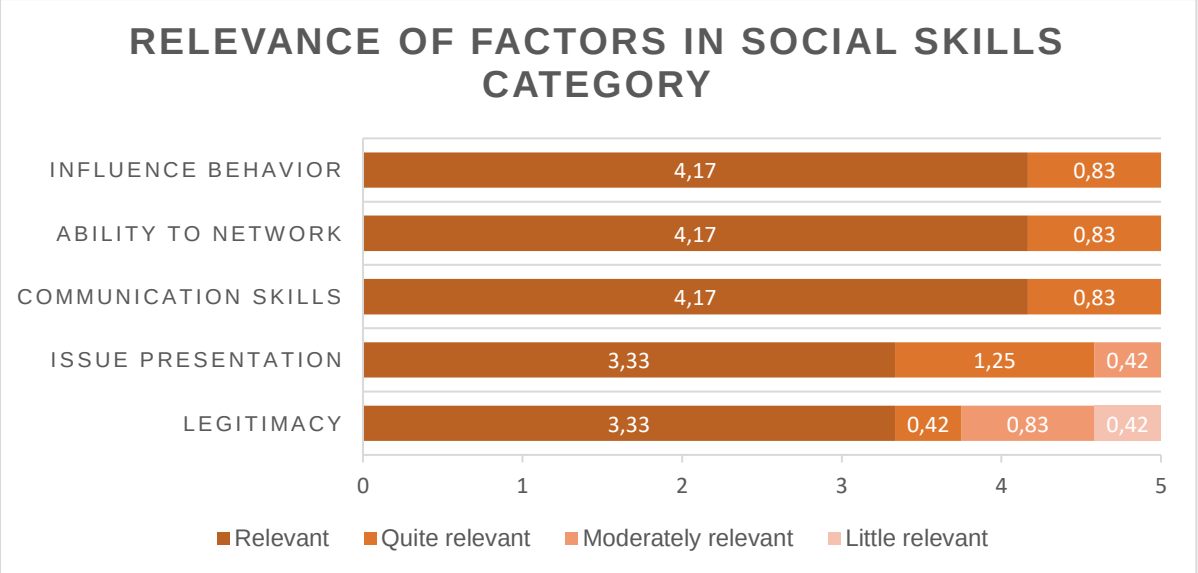


Figure 19. Expert opinions on the relevance of factors pertaining to Social skills category

Definitions. Most of the experts agreed or somewhat agreed with all definitions (90-100% of agreement). One expert somewhat disagreed with Issue presentation name commenting: “Issue sounds like a problem, not like solution or idea. Maybe the name should be changed”. However, this factor has been derived from literature and in this connotation, it means “case” or “cause” rather than “problem”. Another expert had concerns about legitimacy definition because in his opinion legitimacy sounds like it belongs more to the domain-related knowledge category as it is influenced by individual performance and domain-related competence. Though, according to the literature, legitimacy is more correlated with social skills category factors (Perry-Smith and Mannucci, 2017). This factor makes championing activities more convincing and it adds weight to the opinions and decisions of an individual if he or she is perceived as possessing high legitimacy.

Importance. Most of the factors in this category were perceived by the expert as important or quite important to the individual employed in the innovation-intensive industry (by approximately 90% of experts). Predictably, legitimacy was viewed as the least important (only 73% of experts considered it as important or quite important).

- Personality traits category

Relevance. This category seemed to be the most questionable for the experts. As can be derived from Figure 20, the percentage of agreement here is rather low in comparison with the other three categories. Partly it can be explained by the higher number of the factors pertaining to this category. One of the experts noted that it is difficult to evaluate as there are so many factors. Another expert added: “It seems that all mentioned personality traits are relevant. However, depending on the context their weight can be different and possibly more factors might be added”. So, the absence of the context could add to the confusion in the experts’ judgment.

As shown in Figure 20, emotional intelligence factor is the only factor in IFII (apart from legitimacy) that was considered to be “little relevant”. One expert noted that sometimes too much of emotional intelligence may get in the way, particularly when one is constantly seeking opinions of others. However, it is worth noting here that emotional intelligence is researched very little in regard to innovation implementation and it can partly explain why not all experts agreed on its relevance for IFII. Another factor that received the lowest grades on relevance is extraversion. It was expectable as this trait also received mixed evidence in the literature (Roffe, 1999; Patterson, 2002). Some researchers propose an ambivert personality as the best fit to successful innovation implementation. Ambivert is a balance between introvert and extravert with tendency towards introversion (Roffe, 1999). Self-efficacy, risk tolerance and commitment have been marked as the most relevant factors for IFII.

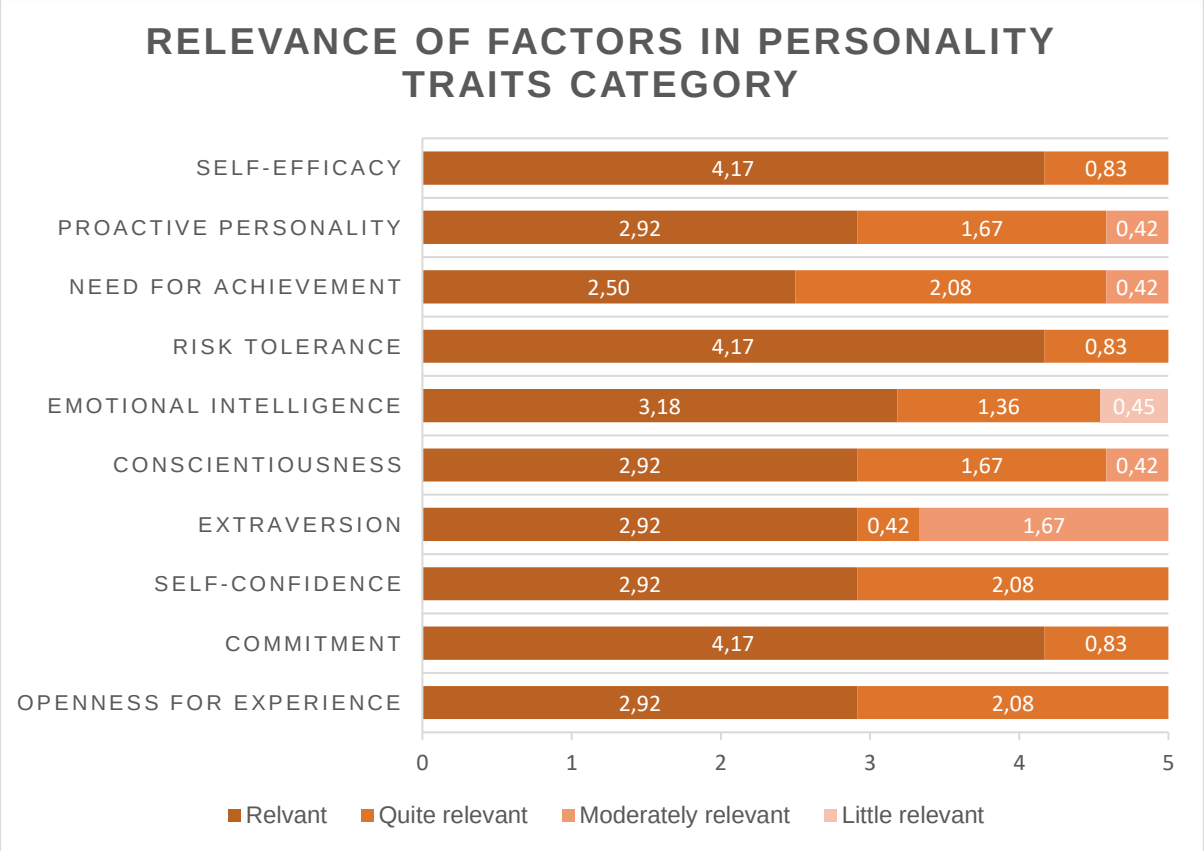


Figure 20. Expert opinions on the relevance of factors pertaining to Personality traits category

Definitions. All definitions of factors received the agreement of experts (for each definition, minimum 90% of experts chose "strongly agree" or "somewhat agree" options). One expert suggested that self-efficacy and self-confidence factors should be revised and redefined as for now they seem to be overlapping. The same was offered for conscientiousness and commitment. I quite agree with these suggestions and necessary revisions should be made in these definitions for the future study.

Importance. Almost all personality factors received good grades on the importance for the individual employed in the innovation-intensive sector (on average, 80-90% of experts evaluated each factor as important or quite important). Extraversion factor received the lowest grade. The third part of all experts marked this factor as only somewhat important. As most of them are from Finland it can possibly be attributed to cultural differences. Surprisingly, the commitment factor received a high grade although it is little researched and rarely attributed to innovation implementation, at least in the analysed literature.

Experts' qualitative and quantitative feedback has been used in order to adjust and refine IFII. Of course, not all suggestions have been implemented but only those that were particularly

justifiable and/or made by most experts. As the review process was showing consistently high ratings and expert opinions were mostly congruent, it was decided not to seek additional group of experts for another round of validation.

6 DISCUSSION

Overall, IFII categories and most factors have been recognized by the experts as relevant. As a result of the validation process, the factor or category has been considered as relevant if it scored 4,5 or more (out of 5). The final score was calculated based on the aggregation of Relevant and Quite relevant answer scores for the respective factor.

The principle of categorization has been approved as well. It can be possibly attributed to the fact that the categorization principle for IFII has been derived from a well-established categorization adopted in the widely recognized Componential Model of Creativity (Amabile, 1983). One expert admitted that the categories do help to simplify things.

However, it was decided to make a few adjustments according to the expert feedback, both quantitative and qualitative. There were not many modifications suggested by the experts, and a number of suggestions have been considered as a valuable addition to the IFII validity and accuracy.

First, it was decided to remove Legitimacy and Extraversion factors from initial IFII as these factors scored less than 4,5 in terms of their relevance to IFII. Legitimacy received little attention from the scholars so with due research it can return to IFII in the future. Extraversion received mixed evidence, so it needs additional research in order to confirm its correlation with implementation success.

Second, though Job knowledge and Operational skills factors scored lower than 4,5 it was decided to keep them in IFII. Job knowledge received a quite strong support from the literature (Zennouche, Zhang and Wang, 2014; Potocnik, Anderson and Latorre, 2015; Birdi, Leach and Magadley, 2016; Standing *et al.,* 2016, among others). Operational skills, though much less researched, seem to be an emerging and quite promising direction of implementation research that has been previously overlooked by the researchers (Wu, Melnyk and Flynn, 2010). Both factors require more research in order to reinforce or debunk their position in IFII.

Third, it was decided to change the name of the Domain-related knowledge category to the Expertise category as it better reflects the nature of the category. The previous name has been considered by the experts as too narrow.

Forth, it was decided to revise most of the definitions according to expert feedback. Each definition should be adjusted and elaborated in order to more accurately convey the essence of the term.

Figure 21 presents IFII improved as a result of all mentioned adjustments.

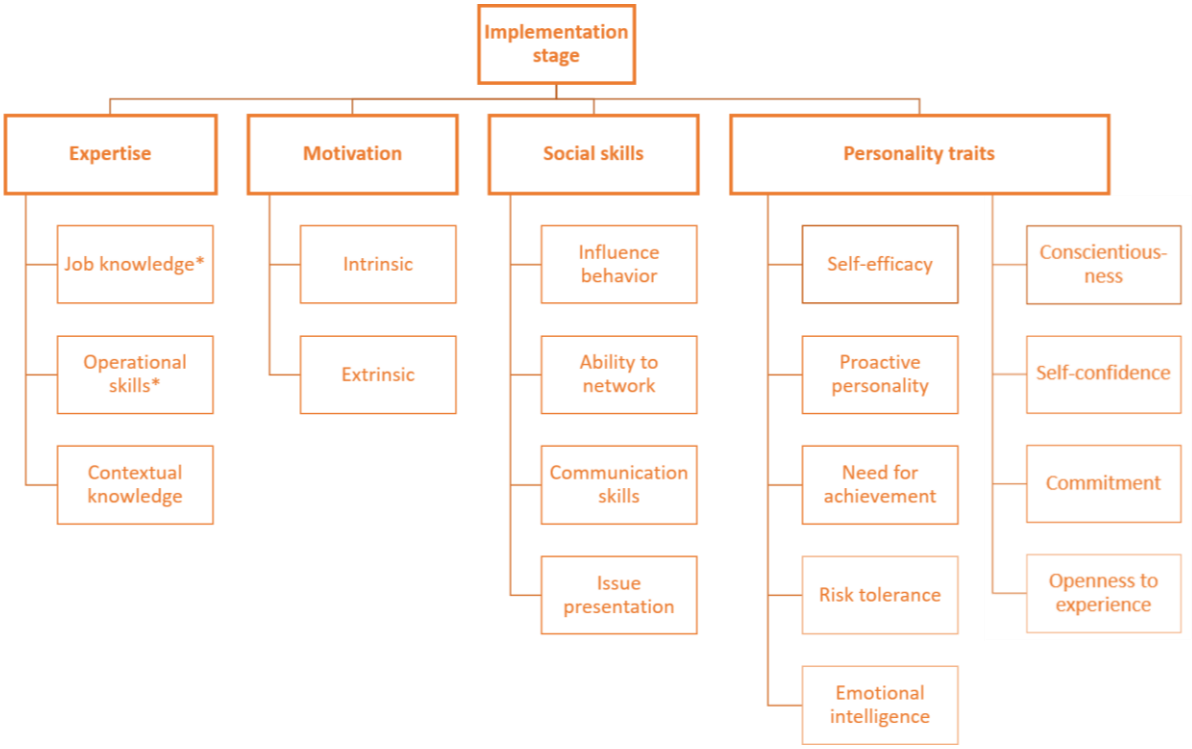


Figure 21. Final version of IFII adjusted according to the expert feedback (an asterisk indicates that additional research is strongly recommended for Operational skills and Contextual knowledge factors in order to reinforce their position in IFII)

The validation of IFII by experts confirmed that individual-level factors found in the implementation literature are important for the successful implementation of innovations in organizations. The importance and relevance of social skills for idea implementation was once again emphasised and corroborated in addition to the evidence found in the literature (Anderson and Bateman, 2000; Howell and Boies, 2004). Knowledge and expertise as a factor required for idea implementation was elaborated on, divided into three distinct factors, and explained in more detail. And most important, different factors have been brought together from different sources and categorized in a simple and illustrative way as acknowledged by the experts.

The results of the study also support the claim of some implementation researchers (e.g. Choi and Price, 2005) that idea implementation requires more than just generic knowledge and is actually a more complex and demanding activity than it has been considered before. In addition, current research revealed that the knowledge of factors facilitating innovation on the individual level is still limited and fragmented. To address this issue, a number of directions for future research have been outlined in Future research section.

The last point that should be mentioned in this section concerns the comments from several experts inquiring how IFII can fit into the context of organizational innovation. In addition, some experts mentioned that in IFII they were missing exogenous factors influencing the individuals and their implementation efforts from outside. To briefly address this comment, it was decided to experimentally integrate IFII into the Model of creativity in organizational work environment (Amabile, 1996) that considers innovation process in organization on two levels: individual and organizational (Fig. 22).

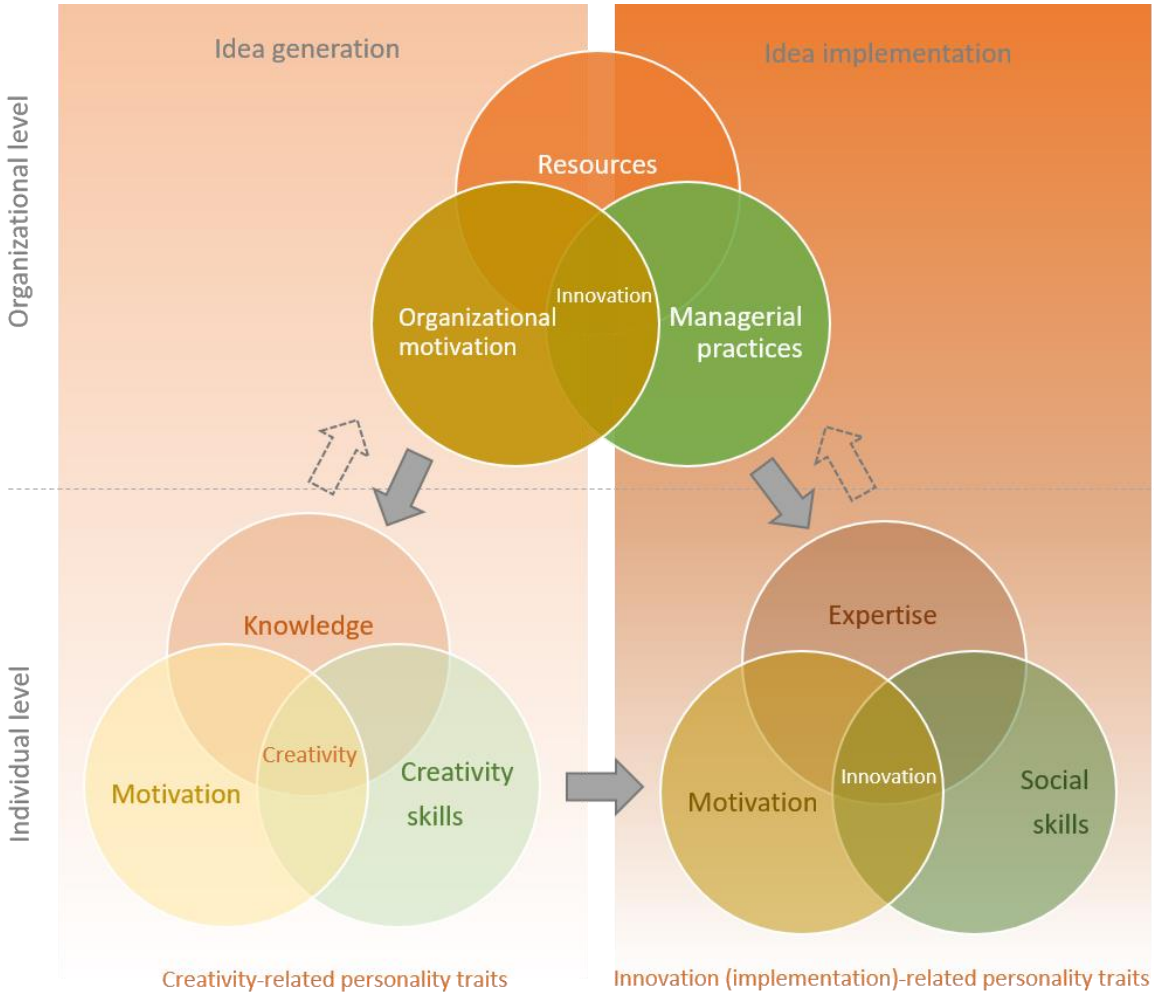


Figure 22. Integration of IFII into organizational environment (adapted from Amabile (1996))

Figure 22 shows how IFII and respective model of innovation implementation (bottom-right figure) fits well with the model proposed by Amabile (1996) (bottom-left and top-centre figures). The model shows how individual creativity and innovativeness influence overall organizational innovation. The elements of organizational structure that are conducive of innovation are presented in top-centre figure. As Amabile (1996) suggested, the work environment influences individual creativity (solid arrow), whereas individual creativity represents the main source of

creativity in an organization (transparent arrow). Integrated model of innovation implementation represents the link that was absent from Amabile's model. It shows that individual creativity is a source of individual innovation that impacts organizational innovation when brought up into organizational settings. At the same time, organizational elements influence or source both individual creativity and individual innovation in order to ensure that they thrive and flourish.

To my understanding, this model (Fig. 22) is a more complete version of Amabile's model. It requires additional research in organizational creativity and innovation with subsequent validation as in the case of IFII.

7 CONCLUSION

This study was inspired by the question: what factors are indicative of the individual with high innovation potential who can successfully handle the complex process of innovation implementation? In line with this question, innovation scholars have been insisting that more rigorous research in this area is needed (Choi and Price, 2005). The relevance of this research was underscored by the importance of the implementation process for the success of innovation and the huge role that the individual is playing in this process. The literature revealed that although it is instrumental to assign competent people for innovation implementation, there is no established agreement on how these individuals can be identified or which qualities and skills they should possess.

This study endeavoured to bridge this gap by collecting fragmented knowledge on individual-level factors facilitating innovation implementation from different literature sources. The main research question concerned the identification of factors promoting innovation on the idea implementation stage of the innovation process on an individual level. Accordingly, the number of individual-level factors has been derived from implementation literature across several different domains of knowledge ranging from Psychology to Management. It ensured better accuracy as a certain level of triangulation has been achieved and certain interdisciplinarity for such a multidisciplinary topic as innovation implementation has been attained.

Another research question concerned the most appropriate approach to the categorization of individual-level factors. The collected factors have been categorised using the categorization principle employed in the Componential Model of Creativity (Amabile, 1983), a well-established and highly regarded model of creativity encompassing factors indicative of an individual's creative potential. The integrated framework for the idea implementation stage of the innovation process (IFII) contains 18 factors spread across four categories (Expertise, Motivation, Social skills, and Personality traits). The framework was validated by the selected set of innovation experts in order to prove its coherence and ensure reliability.

IFII is the first framework of this kind and to date, it is the fullest collection of individual-level factors facilitating innovation implementation. Apart from adding to the implementation research, IFII lays the ground for further development of tools and methods for evaluation of the innovative potential of the individuals in the organization.

7.1 Theoretical implications

The theoretical contribution of this study involves increasing the body of knowledge on innovation implementation, particularly on the individual level of analysis. Idea implementation

is an emerging direction of research in innovation literature (Magadley and Birdi, 2012). First, this study draws the line between idea generation and idea implementation as two distinctly different stages of the innovation process. Despite ample research on innovation, this distinction has often been disregarded as has been pointed out by a number of implementation researchers (Axtell *et al.,* 2000; Baer, 2012, among others). As acknowledged by one of the experts participating in IFII validation, current research brings in additional clarification between idea generation and idea implementation stages, often disregarded in previous research.

Second, this study emphasizes the role of the individual and the importance of the individual perspective in innovation implementation research. As claimed by Choi and Price (2005) implementation has been mostly studied from an organizational perspective, while the individual level of analysis in implementation research did not have many proponents. One of the experts participating in IFII validation observed that this study is a worthwhile attempt to contribute to the research on the individual factors influencing idea implementation because it clearly lacks detailing.

Third, there was little agreement on the implementation definition and elements among implementation researchers (Real and Poole, 2005). This study addressed these issues by introducing a comprehensive definition of implementation as viewed from an individual perspective and clarifying what elements the implementation stage consists of. It allows identifying reference points for future research in idea implementation on the individual level.

Most importantly, this study contributed to the identification of individual-level factors facilitating innovation implementation and composing them into one integrated framework that was not achieved in previous implementation research (Baer, 2012; Anderson, Potocnik and Zhou, 2014). The developed framework is the first attempt to categorize and collate dispersed information on the individual factors promoting the implementation of innovation. It can become a foundation for future research in this area.

In addition, this study helps to outline the limits of innovation implementation knowledge on the individual level, define arguable areas, and reveal avenues for future research.

7.2 Managerial implications

In terms of practical implications, the research outcomes build the platform for the contribution to innovation management practices in organizations. IFII can potentially be developed further to provide more practical value, particularly in case of HR and managerial practices aiming at enhancing innovative potential of employees. Better understanding of individual factors

promoting more efficient idea implementation will allow managers to choose better leadership strategies as well as offer employees adequate training, managerial support and conditions for more effective implementation of innovative ideas. Moreover, the structured representation of individual factors indicating potential for effective innovation implementation can be a valuable contribution to such HR practices as recruitment, training, incentives structure, and talent management. As mentioned, it can lay ground for the development of assessment procedure and tools as well as methods for promoting implementation-oriented behavior. It, in turn, will be instrumental for framing the innovation capability profile that HR specialists can use for more effective management of existing talents and attraction of new ones.

7.3 Limitations

The main limitation of this study is the nascent nature of implementation research. As mentioned, implementation research is still in its emerging stage, particularly on the individual level and the number of relevant articles is scarce (Choi and Price, 2005). In addition, not many researchers recognize the difference between the idea generation and idea implementation stages, and it reduced the number of articles exploring the factors explicitly attributed to the implementation stage even more (Magadley and Birdi, 2012). It means that with the development of the implementation research more factors can emerge in the literature and then IFII should be reassessed.

Besides, time constraints resulted in a series of limitations related to expert validation. First, not all approached experts had time to complete the survey. Second, in order to shorten the description part in the questionnaire, it was decided to make the definitions of factors and categories as concise as possible, which brought some confusion in the judgment of the experts. As a result, experts gave some factors lower points for relevance. Third, only experts from academia participated in the validation process, although it would be desirable to include the experts from business and industry in order to bring in a more practical perspective that would allow for a more nuanced validation. It should become one of the directions for future research.

The findings, though providing valuable insights for implementation researchers and managers, still require further research for their operationalization. It was outside the scope of the present study, but for the future, the factors should be assessed in terms of their weight (possibly in different contexts), interconnection and measurement in order to make them applicable for the development of the managerial practices for more effective implementation management and the tools for the assessment of the innovation potential of individuals in organizations.

Also, it is worth noting that IFII is not a fully articulated framework. It is a general framework of individual-level factors that determine the successful implementation of creative ideas. The framework requires further research and testing in different contexts.

7.4 Future research

Future steps for current research are already defined. The second round of validation including innovation experts from business and industry will be organized in order to test IFII from another perspective and assess how high IFII scores in its practical relevance. Besides, it would be interesting to compare responses and opinions on IFII of the experts from academia and industry.

As revealed in the literature, there are quite many gaps and open questions that require further and more detailed research. First, the factors constituting IFII should be further investigated because some factors (e.g. conscientiousness) received mixed evidence on their positive relationship with innovation and implementation of ideas. Interconnection between factors in IFII that was briefly mentioned in chapter 4 Framework in the descriptions of factors, should be established and corroborated with empirical evidence. Also, as IFII factors have been formed from a number of similar factors found in different literature sources through a clustering procedure, it would be useful to explore those factors in more detail and maybe re-form the overarching factors or add to them. It can possibly improve the accuracy of IFII.

Second, IFII should be verified in different contexts. As one of the experts pointed out there is a chance that implementation of innovation in different settings (e.g. large corporations as opposed to start-ups) will depend on different individual-level factors. This kind of verification will allow to establish IFII generalizability and possibly define a weighting for each factor depending on a certain context. For example, contextual knowledge can be more pivotal for innovators in Google corporation than for innovators in a small start-up.

In addition, further research can be conducted on the factors that have not been used for IFII because they have been mentioned in the analysed literature only once. On closer examination, these factors can potentially represent promising directions for future research. For example, it would be interesting to investigate if developmental factors (factors, which are influencing the individual while he or she is growing up, like a family situation, the atmosphere at home, and the presence of siblings) affect the propensity of the individual to engage in implementation-oriented behaviour.

And lastly, assuming the importance of implementation research for organizations, it is highly recommended to conduct more implementation research in the Management domain because for now, the scope of research in this domain is rather meagre.

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APPENDIX A: Questionnaire for expert validation

Integrated framework for the idea implementation stage of innovation process (IFII)

Questionnaire for expert validation

BLOCK 1

Research description and IFII presentation

BLOCK **2**

Part 1. Please give your opinion on

Q1 Clarity and relevance of research idea

_____

Q2 Quality of research design

_____

Q3 Criteria for literature selection (too broad, too constraining)

_____

Part *2.* Categories

Q4 Please indicate **how much** each category is **relevant** for the Framework, in your opinion

	Relevant (1)	Quite relevant (2)	Moderately relevant (3)	Little relevant (4)	Not relevant (5)
Domain-related knowledge (1)	○	○	○	○	○
Motivation (2)	○	○	○	○	○
Social skills (3)	○	○	○	○	○
Personality traits (4)	○	○	○	○	○

Q5 If you selected other than Relevant for any category, please briefly explain why

_____

Q6 What categories would you add and why (if any)

_____

Q7 **To what extent** do you **agree with the definitions** of the categories?

Please refer to the attached document OR to the definition box at the bottom of this page

	Strongly agree (1)	Somewhat agree (2)	Neither agree nor disagree (3)	Somewhat disagree (4)	Strongly disagree (5)
Domain-related knowledge (1)	○	○	○	○	○
Motivation (2)	○	○	○	○	○
Social skills (3)	○	○	○	○	○
Personality traits (4)	○	○	○	○	○

Q8 If you selected other than Strongly agree, please briefly explain why

_____

Q9 Your thoughts and suggestions on categorization (if any)

_____

[Definition box at the bottom of the page]

Definitions of the categories

Domain-related knowledge is a set of knowledge, skills and expertise, which individual needs to implement innovation, related to domain(s) in which innovation process takes place (Birdi, Leach and Magadley, 2016).

Motivation is a desire of the individual to implement creative ideas and bring them to life. On the implementation stage, motivation plays a particularly important role as idea

implementation is stronger associated with overcoming challenges than idea generation (Baer, 2012).

Social skills facilitate interaction and communication with other people (Baron and Markman 2000). Yuan and Woodman (2010) and Magadley and Birdi (2012) underline social nature of implementation process putting in its centre social skills and connections that allow acquiring resources and support necessary for the implementation of an idea.

Personality traits are patterns of behaviour, thoughts and emotions uniquely characterizing an individual (Kassin, 2003).

[End of the definition box at the bottom of the page]

Part 3. Factors pertaining to Domain-related knowledge

Q10 Please indicate **how much** each factor in Domain-related knowledge category is **relevant** for the Framework, in your opinion.

	Relevant (1)	Quite relevant (2)	Moderately relevant (3)	Little relevant (4)	Not relevant (5)
Job knowledge (1)	○	○	○	○	○
Operational skills (2)	○	○	○	○	○
Contextual knowledge (3)	○	○	○	○	○

Q11 If you selected other than Relevant, please briefly explain why

_____

Q12 **How much** each factor is **important** to have for an individual employed in innovation-intensive sector (in your opinion as an employer/manager)?

	Important (1)	Quite important (2)	Somewhat important (3)	Not very important (4)	Not important (5)
Job knowledge (1)	○	○	○	○	○
Operational skills (2)	○	○	○	○	○
Contextual knowledge (3)	○	○	○	○	○

Q13 What are the other important factors for this category, in your opinion, and why (if any)

_____

Q14 **To what extent** do you **agree with definitions** of factors?

Please refer to the attached document OR to the definition box at the bottom of this page.

	Strongly agree (1)	Somewhat agree (2)	Neither agree nor disagree (3)	Somewhat disagree (4)	Strongly disagree (5)
Job knowledge (1)	○	○	○	○	○
Operational skills (2)	○	○	○	○	○
Contextual knowlege (3)	○	○	○	○	○

Q15 If you selected other than Strongly agree, please briefly explain why

_____

Q16 Your thoughts and suggestions on factors in Domain-related knowledge category (if any)

_____

[Definition box at the bottom of the page]

Definitions of factors in Domain-related knowledge category

Job knowledge refers to knowledge and technical expertise about the domain(s) where innovation takes place (Birdi, Leach and Magadley, 2016). A competent individual is able to realize the idea in practice as he/she has deeper understanding of underlying principles and nuances that allows to better navigate the implementation process and find solutions.

Operational skills refer to competency of an individual to realize ideas into practice. Operational skills may include innovation-related planning as well as project, time and change management that help the idea to reach its potential (Markham, 2002).

Contextual knowledge. This factor concerns knowledge of the rules, values and routines in the organization as well as how decisions are made, who knows what and who can make things happen (Sternberg, 2006).

[End of the definition box at the bottom of the page]

Part 4. Factors pertaining to Motivation

Q17 Please indicate **how much** each factor in Motivation category is **relevant** for the Framework, in your opinion.

	Relevant (1)	Quite relevant (2)	Moderately relevant (3)	Little relevant (4)	Not relevant (5)
Intrinsic motivation (1)	○	○	○	○	○
Extrinsic motivation (2)	○	○	○	○	○

Q18 If you selected other than Relevant, please briefly explain why

_____

Q19 **How much** each factor is **important** to have for an individual employed in innovation-intensive sector (in your opinion as an employer/manager)?

	Important (1)	Quite important (2)	Somewhat important (3)	Not very important (4)	Not important (5)
Intrinsic motivation (1)	○	○	○	○	○
Extrinsic motivation (2)	○	○	○	○	○

Q20 What are the other important factors for this category, in your opinion, and why (if any)

_____

Q21 **To what extent** do you **agree with definitions** of factors?

Please refer to the attached document OR to the definition box at the bottom of this page.

	Strongly agree (1)	Somewhat agree (2)	Neither agree nor disagree (3)	Somewhat disagree (4)	Strongly disagree (5)
Intrinsic motivation (1)	○	○	○	○	○
Extrinsic motivation (2)	○	○	○	○	○

Q22 If you selected other than Strongly agree, please briefly explain why

_____

Q23 Your thoughts and suggestions on factors in Motivation category (if any)

_____

[Definition box at the bottom of the page]

Definitions of factors in Motivation category

Intrinsic motivation is “a motivational state generated by the individual's reaction to intrinsic properties of the task” (Amabile, 1983, p.365). Intrinsic motivation comes from within and is sparked by individual’s innate interest, passion for the topic and desire to find solution.

Extrinsic motivation comes from external factors such as money, career promotion or reputational benefits. It plays a significant role on implementation stage as implementation requires an additional effort in overcoming implementation-related obstacles and individuals would like to be rewarded for exerting this effort (Baer, 2012).

[End of the definition box at the bottom of the page]

Part 5. Factors pertaining to Social skills

Q24 Please indicate **how much** each factor in Social skills category is **relevant** for the Framework, in your opinion.

	Relevant (1)	Quite relevant (2)	Moderately relevant (3)	Little relevant (4)	Not relevant (5)
Influence behavior (1)	○	○	○	○	○
Ability to network (2)	○	○	○	○	○
Communication skills (3)	○	○	○	○	○
Issue presentation (4)	○	○	○	○	○
Legitimacy (5)	○	○	○	○	○

Q25 If you selected other than Relevant, please briefly explain why

_____

Q26 **How much** each factor is **important** to have for an individual employed in innovation-intensive sector (in your opinion as an employer/manager)?

	Important (1)	Quite important (2)	Somewhat important (3)	Not very important (4)	Not important (5)
Influence behavior (1)	○	○	○	○	○
Ability to network (2)	○	○	○	○	○
Communication skills (3)	○	○	○	○	○
Issue presentation (4)	○	○	○	○	○
Legitimacy (5)	○	○	○	○	○

Q27 What are the other important factors for this category, in your opinion, and why (if any)

_____

Q28 **To what extent** do you **agree with definitions** of factors?

Please refer to the attached document OR to the definition box at the bottom of this page.

	Strongly agree (1)	Somewhat agree (2)	Neither agree nor disagree (3)	Somewhat disagree (4)	Strongly disagree (5)
Influence behavior (1)	○	○	○	○	○
Ability to network (2)	○	○	○	○	○
Communication skills (3)	○	○	○	○	○
Issue presentation (4)	○	○	○	○	○
Legitimacy (5)	○	○	○	○	○

Q29 If you selected other than Strongly agree, please briefly explain why

_____

Q30 Your thoughts and suggestions on factors in Social skills category (if any)

_____

[Definition box at the bottom of the page]

Definitions of factors in Social skills category

Influence behaviors are the behaviors that are based on tactics helping the individual to overcome obstacle on the way of idea implementation, surmount criticism and possible resistance, and persuade decision makers to allocate resources and support for idea realization (Perry-Smith and Mannucci, 2017).

Ability to network is defined as "an extent to which people are skilled in developing and using social networks to effect change at work" (Baer, 2012, p. 1106).

Communication skills enable the individuals to efficiently communicate with others and also successfully convey their vision, opinions and suggestions in order to move the ideas forward (Birdi, Leach and Magadley, 2016).

***Issue presentation*.** Issue/idea presentation is aiming at presenting the idea in a particular manner in order to effectively "sell" the idea to decision makers and ensure sponsorship (Andersson and Bateman, 2000).

Legitimacy is a reputational factor that is based on the individual's performance, competence in the domain where innovation takes place and perceived ability to implement an idea. Individuals with higher legitimacy are more likely to be granted approval, resources and support by decision makers (Perry-Smith and Mannucci, 2017).

[End of the definition box at the bottom of the page]

Part 6. Factors pertaining to Personality traits

Q31 Please indicate **how much** each factor in Personality traits category is **relevant** for the Framework, in your opinion.

	Relevant (1)	Quite relevant (2)	Moderately relevant (3)	Little relevant (4)	Not relevant (5)
Self-efficacy (1)	○	○	○	○	○
Proactive personality (2)	○	○	○	○	○
Need for achievement (3)	○	○	○	○	○
Risk tolerance (4)	○	○	○	○	○
Emotional intelligence (5)	○	○	○	○	○
Conscientiousness (6)	○	○	○	○	○
Extraversion (7)	○	○	○	○	○
Self-confidence (8)	○	○	○	○	○
Commitment (9)	○	○	○	○	○
Openness for experience (10)	○	○	○	○	○

Q32 If you selected other than Relevant, please briefly explain why

_____

Q33 **How much** each factor is **important** to have for an individual employed in innovation-intensive sector (in your opinion as an employer/manager)?

	Important (1)	Quite important (2)	Somewhat important (3)	Not very important (4)	Not important (5)
Self-efficacy (1)	○	○	○	○	○
Proactive personality (2)	○	○	○	○	○
Need for achievement (3)	○	○	○	○	○
Risk tolerance (4)	○	○	○	○	○
Emotional intelligence (5)	○	○	○	○	○
Conscientiousness (6)	○	○	○	○	○
Extraversion (7)	○	○	○	○	○
Self-confidence (8)	○	○	○	○	○
Commitment (9)	○	○	○	○	○
Openness to experience (10)	○	○	○	○	○

Q34 What are the other important factors for this category, in your opinion, and why (if any)

_____

Q35 **To what extent** do you **agree with definitions** of factors?

Please refer to the attached document OR to the definition box at the bottom of this page.

	Strongly agree (1)	Somewhat agree (2)	Neither agree nor disagree (3)	Somewhat disagree (4)	Strongly disagree (5)
Self-efficacy (1)	○	○	○	○	○
Proactive personality (2)	○	○	○	○	○
Need for achievement (3)	○	○	○	○	○
Risk tolerance (4)	○	○	○	○	○
Emotional intelligence (5)	○	○	○	○	○
Conscientiousness (6)	○	○	○	○	○
Extraversion (7)	○	○	○	○	○
Self-confidence (8)	○	○	○	○	○
Commitment (9)	○	○	○	○	○
Openness to experience (10)	○	○	○	○	○

Q36 If you selected other than Strongly agree, please briefly explain why

_____

Q37 Your thoughts and suggestions on factors in Personality traits category (if any)

_____

[Definition box at the bottom of the page]

Definitions of factors in Personality traits category

Self-efficacy refers to "the beliefs in one's capabilities to organize and execute the courses of action required to produce desired results" (Bandura, 1997, p. 3). Self-efficacy promotes enthusiasm and confidence about success of innovation and helps the individual to overcome challenges (Howell *et al.,* 2005).

Proactive personality as a trait refers to a readiness of the individual to initiate change (Potocnik, Anderson and Latorre, 2015).

***Need for achievement*.** This trait is characteristic of the individuals who are particularly interested in achievement where their abilities are an instrumental factor for solving the issue (Roffe, 1999).

Risk tolerance is the ability of an individual to take risks associated with innovation and learn from failure (Standing *et al.,* 2016).

Emotional intelligence is defined as "an ability where people regard their own emotions and the emotions of other people as bases for framing their relationship with others" (Zhang *et al.,* 2015). Emotional intelligence has a positive relationship to the individual's innovativeness (Ngah and Salleh, 2015).

Conscientiousness is a trait of being diligent, dedicated, committed and hard-working (Roffe, 1999), which is important during idea implementation (Potocnik, Anderson and Latorre ,2015).

Extraversion is ascribed to outgoing and social individuals. It is indicative of a propensity to try out new ideas (Potocnik, Anderson and Latorre, 2015) and beneficial for finding support for idea implementation (Kumar and Bharadwaj, 2016).

Self-confidence is a trait making the individual value her/himself and believe in her/his ability to perform well. Confident individuals are more inclined to challenge status quo and initiate change (Potocnik, Anderson and Latorre, 2015).

Commitment is a quality of being dedicated to a chosen course of action. Commitment ensures that the individual will persist in overcoming challenges related to idea implementation and bring it to successful completion (Howell and Boies, 2004).

***Openness to experience*.** It is a personality trait closely associated with intelligence and curiosity, which indicates individual's inclination towards novelty. It is predictive of innovative behavior (Patterson, Kerrin and Gatto-Roissard, 2009).

[End of the definition box at the bottom of the page]

Part 6. Personal information

Q38 Your name

_____

Q39 Country

▼ Afghanistan (1) ... Zimbabwe (1357)

Q40 Your organization(s)

_____

Q41 Sector (please select all that apply)

- ☐ Academia (1)
- ☐ Industry/business (2)

Q42 Field (please select all that apply)

- [ ] Agriculture, food and natural resources (1)
- [ ] Architecture and construction (2)
- [ ] Arts, culture and entertainment (3)
- [ ] Business, management and administration (4)
- [ ] Communications (5)
- [ ] Community and social services (6)
- [ ] Education and training (7)
- [ ] Finance (8)
- [ ] Science, engineering and technology (9)
- [ ] Government and public administration (10)
- [ ] Health and medicine (11)
- [ ] Information technology (12)
- [ ] Law and public policy (13)
- [ ] Manufacturing (14)
- [ ] Marketing, sales and service (15)
- [ ] Transportation and logistics (16)
- [ ] Other (17)

Q43 If you selected Other in Field question please specify

_____

Q44 Job title(s)

_____

Q45 Years of professional experience related to innovation

- ○ less than 5 (4)
- ○ 5-10 (5)
- ○ 11-25 (6)
- ○ more than 25 (7)

Q46 How your occupation is related to innovation?

Examples: main area of research (published N articles on innovation implementation), engineer in R&D department of ABC Inc., innovation consultant in energy sector, etc.

_____

Q47 Thank you very much for your time and valuable contribution!
I will integrate your feedback and get back to you with improved version of the framework for your final approval!

Q48 Please indicate if you are interested to discuss this topic in more detail in the informal interview

- ○ Yes (1)
- ○ No (2)

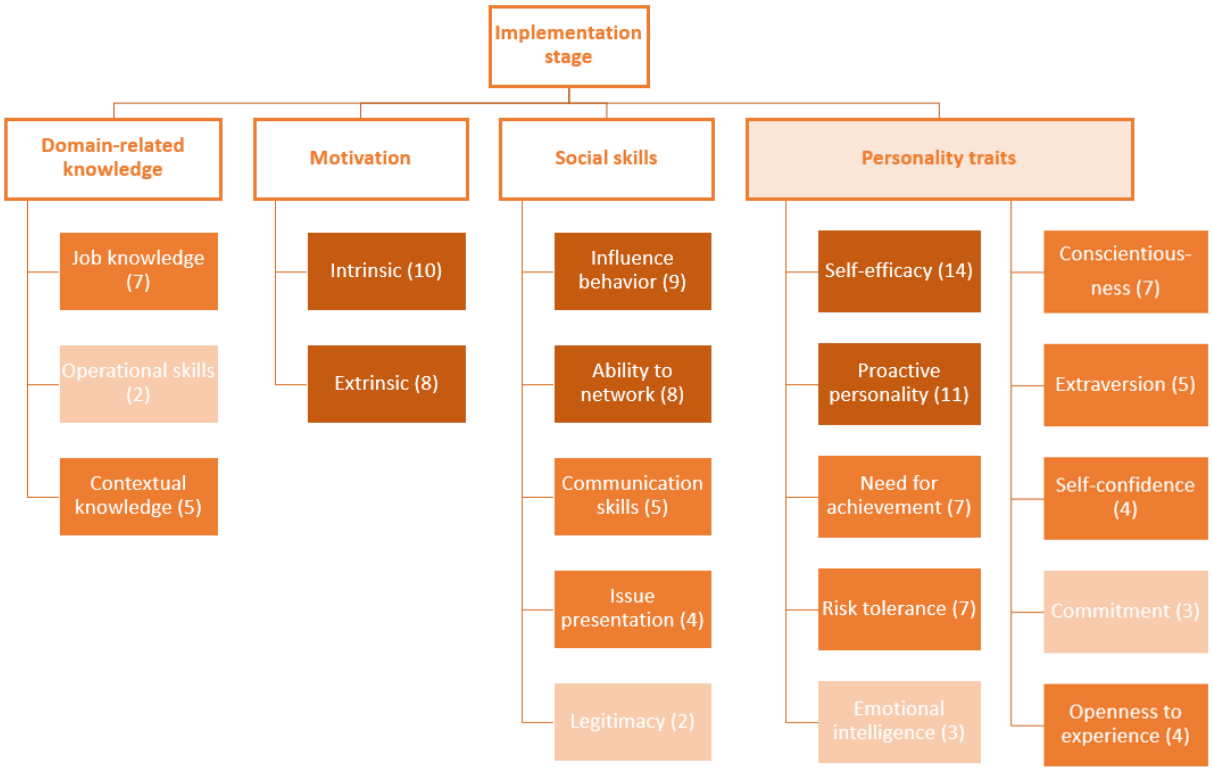
Q49 Your final thoughts and suggestions (if any)

_____

APPENDIX B: Supplement material for experts

The framework and the definitions of categories and factors as presented to the experts in the process of IFII validation

Below, IFII is represented in a form of a heatmap showing the frequency of occurrence of the factors in the analyzed literature (Pic. 1). The frequency is indicated in brackets for each factor. The number of articles used for building IFII is 38. In addition to the facets derived from the Componential model of creativity (Amabile, 1983) (Domain-related knowledge, Motivation, Social skills), Personality traits category is introduced as it is found to be widely mentioned in the analyzed literature.



Picture 1. Heatmap of the IFII based on literature review

Source: own design

Categories

- *Domain-related knowledge* is a compound of knowledge, skills and expertise related to domain(s) in which innovation process takes place necessary for the individual to successfully bring innovation to fruition (Birdi, Leach and Magadley, 2016).
- *Motivation* concerns a desire of the individual to implement creative ideas and bring them to life. On the implementation stage, motivation plays a particularly important role as idea implementation is stronger associated with overcoming challenges and adversity than idea generation (Baer, 2012).

- *Social skills* are skills that facilitate interaction and communication with other people (Baron and Markman, 2000). Yuan and Woodman (2010) and Magadley and Birdi (2012) underline social nature of implementation process putting in its centre social skills and connections that allow to acquire resources and support necessary for the implementation of idea.
- *Personality traits* are patterns of behavior, thoughts and emotions uniquely characterizing an individual (Kassin, 2003).

Descriptions of factors

- Domain-related knowledge category.

  Job knowledge refers to knowledge and technical expertise about the domain(s) where innovation takes place (Birdi, Leach and Magadley, 2016). A competent individual is able to realize the idea in practice more expertly as she has deeper understanding of underlying principles and nuances that allows to better navigate the implementation process and find solutions.

  Operational skills refer to competency of an individual to realize ideas into practice. Operational skills may include innovation-related planning as well as project, time and change management that help the idea to reach its potential (Markham, 2002).

  Contextual knowledge. This factor concerns knowledge of the rules, values and routines in the organization as well as how decisions are made, who knows what and who can make things happen (Sternberg, 2006).
- Motivation category.

  Intrinsic motivation is “a motivational state generated by the individual's reaction to intrinsic properties of the task” (Amabile, 1983, p.365). Intrinsic motivation comes from within and is sparked by individual’s innate interest, passion for the topic and desire to find solution.

  Extrinsic motivation stems from external motivational factors such as money, career promotion or reputational benefits. It plays a significant role on implementation stage as implementation require additional effort that individual would like to be rewarded for (Baer, 2012).
- Social skills category.

  Influence behaviors are the behaviors that are based on tactics helping the individual overcome obstacle on the way of idea implementation, surmount criticism and possible resistance, and persuade decision makers to allocate resources and support for idea realization (Perry-Smith and Mannucci, 2017).

  Ability to network is defined as “an extent to which people are skilled in developing and using social networks to effect change at work” (Baer, 2012, p. 1106).

Communication skills. Communication skills enable the individuals to efficiently communicate with others and also successfully convey their vision, opinions and suggestions in order to move the ideas forward (Birdi, Leach and Magadley, 2016).

Issue presentation. Issue/idea presentation is aiming at presenting the idea in a particular manner in order to effectively "sell" the idea to decision makers and ensure sponsorship (Andersson and Bateman, 2000).

Legitimacy is a reputational factor that is based on the individual's performance, competence in the domain where innovation takes place and perceived ability to implement an idea. Individuals with higher legitimacy are more likely to be granted approval, resources and support by decision makers (Perry-Smith and Mannucci, 2017).

- Personal traits category.

  Self-efficacy refers to "the beliefs in one's capabilities to organize and execute the courses of action required to produce desired results" (Bandura, 1997, p. 3). Self-efficacy promotes enthusiasm and confidence about success of innovation and helps the individual to persist under adversity (Howell *et al.,* 2005).

  Proactive personality as a trait refers to a readiness of the individual to initiate change (Potocnik, Anderson and Latorre, 2015).

  Need for achievement. This trait is characteristic of the individuals who are particularly interested in achievement where their abilities are an instrumental factor for solving the issue (Roffe, 1999).

  Risk tolerance is the ability of an individual to take risks associated with innovation and learn from failure (Standing *et al.,* 2016).

  Emotional intelligence is defined as "an ability where people regard their own emotions and the emotions of other people as bases for framing their relationship with others" (Zhang *et al.,* 2015). Emotional intelligence has a positive relationship to the individual's innovativeness (Ngah and Salleh, 2015).

  Conscientiousness is a trait of being diligent, dedicated, committed and hard-working (Roffe, 1999), which is important during idea implementation (Potocnik, Anderson and Latorre, 2015).

  Extraversion is a characteristic trait ascribed to outgoing and social individuals. It is indicative of a propensity to try out new ideas (Potocnik, Anderson and Latorre, 2015) and beneficial for finding support for idea implementation (Kumar and Bharadwaj, 2016).

  Self-confidence is a trait making the individual value herself and believe in her ability to perform well. Confident individuals are more inclined to challenge status quo and initiate change (Potocnik, Anderson and Latorre, 2015).

  Commitment is a quality of being dedicated to a chosen course of action. Commitment ensures that the individual will persist in overcoming pressures and adversity related to idea implementation and bring it to successful fruition (Howell and Boies, 2004).

Openness to experience. It is a personality trait closely associated with intelligence and curiosity, which indicates individual's inclination towards novelty. It is predictive of innovative behavior (Patterson, Kerrin and Gatto-Roissard, 2009).