

UNIVERSITY OF LATVIA  
FACULTY OF BUSINESS, MANAGEMENT AND ECONOMICS



MADARA APSALONE

IMPACT OF ORGANIZATIONAL CULTURE AND KNOWLEDGE  
MANAGEMENT PROCESSES ON ORGANIZATIONAL INNOVATION IN  
SMALL AND MEDIUM-SIZED ENTERPRISES

DOCTORAL THESIS

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Supervisor: Dr.oec., professor Ērika Šumilo

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## Abstract

Innovation is a critical source of business growth and competitiveness in today's changing and complex business environment. However, innovation is a complex and uncertain process that can require substantial resources, and the share of innovative micro, small and medium-sized enterprises (SMEs) remains low. Organizational innovation (OI) - new or improved business practices, workplace organization and external relations - remains a relatively under-researched type of innovation yet could be more accessible to SMEs, fostering their efficiency, quality control, learning and external cooperation. By understanding innovation in a broader way and leveraging internal factors – organizational work practices, attitudes and knowledge management processes, SMEs could enhance innovativeness and competitiveness.

The doctoral thesis assesses the impact of organizational culture and knowledge management processes on OI introduction in SMEs based on innovation literature analysis and an empirical study of more than 600 Latvian enterprises from various industries. It identifies innovation enhancing organizational behaviors, attitudes, work and knowledge management practices, and develops a method to assess a measure of the OI introduction and proposes a conceptual model explaining the relationship between organizational culture, knowledge management and OI. It further analyzes the impact of OI on business performance.

The results confirm that the more a SME is characterized by an innovation enhancing organizational culture and knowledge management processes, the higher the likelihood of introducing OI. Professional development, long-term strategic planning, creative discussions, knowledge application, assessment and updating are the main organizational culture and knowledge management factors affecting OI in Latvian SMEs. At the same time, OI also depends on enterprise factors – such as the number of employees, turnover, location, industry, and the level of foreign investment. Furthermore, SME managers find OI beneficial for enterprise innovativeness and competitiveness.

The results explain an innovation enhancing organizational culture in Latvian SMEs using a behavior and practice-based approach. The method to assess the OI introduction measure, as well as the conceptual model can be used in further innovation research, including internationally. The results also suggest patterns of innovation enhancing organizational behaviors that can be recommended to SME managers and practitioners.

**Keywords:** organizational innovation, organizational culture, knowledge management, SME, innovativeness.

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## List of Abbreviations

CATI - computer-assisted telephone interviewing

CIS – the EU Community Innovation Survey

CSB - the Central Statistical Bureau of Latvia

E.g. - Latin, short for *exempli gratia*, meaning “for example”

Et al. - Latin, short for *et alia*, meaning “and others”

EU – the European Union

Ibid - Latin, short for *ibidem*, meaning "in the same place"

KM – knowledge management

LU – the University of Latvia

Micro – microenterprise

OC - organizational culture

OECD - Organization for Economic Co-operation and Development

OI – organizational innovation

OIM - organizational innovation introduction measure

PCA – principle component analysis

R&D - research and development

SMEs - micro, small and medium-sized enterprises

Vs. – versus



# INTRODUCTION

## *Topicality*

The business environment is changing due to long term patterns of demographic and social developments, resource scarcity, widening inequality, operational scale and complexity (Tse and Esposito, 2017). Globalization brings new opportunities and threats, which combined with technological advancements and demographic workforce shifts can cause volatility, uncertainty, complexity, and ambiguity (Bennett and Lemoine, 2014). This increasing volatility, uncertainty, and business complexity shapes markets and changes the nature of competition across industries – businesses that sense, assess, and respond to these pressures first will excel at capturing the opportunities and mitigating the downside risks (Doheny, Nagali, and Weig, 2012). Markets become increasingly interconnected, and the competition no longer remains local. The driving forces behind the external changes imply that businesses must be agile and change along. As Schwab, the founder and the executive chairman of the World Economic Forum suggests: “*The question for every company is no longer, “Am I going to be disrupted?” but, “When is disruption coming, and what form will it take?”*” (Schwab, 2016, p. 20).

Micro, small and medium-sized enterprises (SMEs) play an important role as drivers of social and economic well-being ensuring sustainable and inclusive growth. The OECD (2019) considered SMEs, being the main source of employment, industrial development and local identity, as the key actors in the transition fostering income equality and extending benefits of technological development and globalization. Thus, their ability to create value and sustain a competitive advantage through innovation is essential for economic development and growth. This is particularly relevant for small, open economies as Latvia, where SMEs dominate the business landscape - according to the Central Statistical Bureau of Latvia (CSB, 2019), SMEs accounted for 99.9% of all businesses in Latvia, and 99% had less than 50 employees. Moreover, SMEs ensured 79% of jobs and 70% of gross added value in Latvia (Eurostat, 2017).

Innovation is an important source of growth and a key factor for organizational competitiveness (Amabile, 1988; Lam, 2010; Gunday, Ulusoy, Kilic, and Alpan, 2011). Innovation is vital for businesses, as it provides a faster access and a better connection to markets, leading to bigger opportunities (Henderson, 2017). Successful introduction of innovation would allow SMEs to differentiate and tailor business to attractive niches with loyal customers, thus standing out from the competition (Porter, 1980). SMEs are likely to benefit from the shift towards customer-centric business models (OECD, 2019). Yet, the share of innovative SMEs in Europe remains low – the latest Community Innovation Survey by the Eurostat (CIS, 2016) reported 46% of small and 63% of medium-sized enterprises compared to 77% of large enterprises being

innovative<sup>1</sup>. Additionally, several studies (Veugelers, 2016; Kondratiuk-Nierodzińska, 2016; Sakowski, Vadi and Meriküll, 2018) conclude that the capacity to create knowledge and to innovate significantly differs amongst the EU countries, with the Central and Eastern Europe continuously lagging behind the West Europe. Subsequently, according to the CIS (2016), the share of innovative enterprises in Latvia was just 25.5% of small, 45.1% of medium-sized and 67.2% of large enterprises, significantly below the EU average.

Innovation is a complex and an inherently uncertain process (Kline and Rosenberg, 1986; Dosi, Freeman, Nelson, Silverberg, and Soete, 1988; Brouwer, 2000; Boer, 2001; Jalonen, 2012), and the decision to innovate often takes place under a great ambiguity (Teece, Peteraf, and Leih, 2016). While large enterprises can develop new ideas along already secured revenue streams, SMEs might not have such an opportunity to mitigate the risk (Pullen, De Weerd-Nederhof, Groen, Song, and Fisscher, 2009). Additionally, innovation can require substantial resources - SMEs lag in adoption of digital technologies (OECD, 2019) and might face financial constraints to innovate (Acs and Audretsch, 1988; Nooteboom, 1994; OECD-Eurostat, 2005). They may also lack qualified personnel to effectively implement and manage the change (Madrid-Guijarro, Garcia, and Van Auken, 2009). Considering these aspects, SMEs might incur relatively higher costs and might see less benefits to innovate in comparison to large enterprises. Yet other studies suggest that lack of resources can drive creativity and innovative behavior (Bodlaj, Kadic-Maglajlic, and Vida, 2018), and there may be other reasons behind the low SME innovativeness.

The CIS (2016) assessed the main barriers against innovative activities of Latvian enterprises, and reported that innovative enterprises listed high-costs (30.0%), lack of internal financial resources (23.8%), difficulties to obtain public grants and subsidies (21.6%) and high competition (21.2%) as the main hampering factors for innovation activities, while non-innovative enterprises listed low innovation demand (13.6%), no need to innovate due to previous innovations (12.3%) and lack of innovative ideas (10.4%) as the most significant factors. Just 6.8% of non-innovative enterprises listed high-costs and just 6.7% - lack of internal funding. The impact of other factors was even less significant - 3.3% of non-innovative enterprises reported uncertain market demand and 2.7% - lack of qualified employees as significant barriers to innovation. These findings indicate that non-innovative enterprises in Latvia perceive lack of reasons to innovate and have a shortage of good ideas, before facing specific financial and human resource constraints to innovate, and that organizational level change - organizational innovation - could help them to become more innovative.

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<sup>1</sup> Enterprises that have either introduced an innovation or have any kind of innovation activity (including enterprises with abandoned/suspended or on-going innovation activities), the Eurostat.

Organizational innovation involves implementation of organizational methods, including changes in business practices, workplace organization and external relations, that are new or improved to the enterprise (OECD-Eurostat, 2005; Walker, Chen, and Aravind, 2015). Enterprises introduce organizational innovation to improve business performance and operation efficiency, quality control, learning, and foster other types of innovation or market development (Mol and Birkinshaw, 2009; Arranz, Arroyabe, and de Arroyabe, 2019).

A number of studies recognize the positive impact of organizational innovation on implementing other types of innovation, on business performance and competitiveness. First, organizational innovation can increase innovativeness by empowering organizational structures and processes to use new technologies (Armbruster, Bikfalvi, Kinkel, and Lay, 2008; Tether and Tajar, 2008), improving coordination and cooperation (Gunday et al., 2011), enhancing learning, acquisition and internalization of external knowledge (OECD-Eurostat, 2005; Mol and Birkinshaw, 2009; Merono-Cerdan and Lopez-Nicolas, 2013), thus creating a favorable environment for the development and the use of technical product, process, as well as marketing innovations (Gallego, Rubalcaba, and Hipp, 2011; Peris-Ortiz and Hervás-Oliver, 2014; Damanpour, 2014; Pino, Felzensztein, Zwerg-Villegas, and Arias-Bolzmann, 2016; Bodlaj et al., 2018; Sakowski et al., 2018). Second, organizational innovation serves as an immediate source of competitive advantage through increasing productivity, quality and flexibility (Womack, Jones, and Roos, 1990; Armbruster et al., 2008), and responding to environmental changes, leading to a better business performance (Hamel, 2006; Mol and Birkinshaw, 2009; Arranz et al., 2019), export performance (Gunday et al., 2011; Azar and Ciabuschi, 2017) and sales growth (Evangelista and Vezzani, 2010). In today's disruptive business environment, adoption of organizational innovation has become more a necessity than a choice (Damanpour, Sanchez-Henriquez, and Chiu, 2018).

As with other types of innovation, introduction of organizational innovation in Latvian SMEs is relatively low. According to the CIS (2016), 29% of all enterprises in the EU compared to 18% of enterprises in Latvia had introduced organizational innovation; of those 25% of small enterprises in the EU and 14% - in Latvia, 37% of medium-sized enterprises in the EU and 26% in Latvia, however more balanced for large enterprises - 51% of in the EU and 53% in Latvia. Workplace organization was the most common type of organizational innovation introduced by 10.4% small, 21.1% medium-sized and 47.4% large enterprises, followed by new business practices, introduced by 8.5% small, 20.7% medium-sized and 44.5% large enterprises and, finally, external cooperation, introduced by 5% of small, 8.7% of medium-sized and 23.4% of large enterprises in Latvia. Considering that just each fifth enterprise had introduced organizational innovation, this presents an opportunity for Latvian enterprises to become more innovative and enhance their business performance.

Organizational innovation is affected by various factors at different levels starting from macro context and ending with individual innovation. Yet as organizational innovation primarily concerns enterprise level changes, the author focuses on understanding and influence of enterprise level factors. Underlying organizational factors as organizational behaviors, attitudes and ways of working, the organizational culture, play an important role towards innovation (Boer, 2001; Baer and Frese, 2003; Smith, Busi, Ball, and Van der Meer, 2008; Turró, Urbano, and Peris-Ortiz, 2014; Ali Taha, Sirkova and Ferencova, 2016). Similarly, knowledge management processes – ways of creating, sharing, using and updating knowledge - contribute to organizational innovation (Grant, 1996; Spicer and Sadler-Smith, 2006; Griese, Pick, and Kleinaltenkamp, 2012; Sapprasert and Clausen, 2012). In a survey conducted by the Harvard Business Review, 89% of executives agreed that *“companies must support an enterprise-wide innovation culture where new ideas emanate from everyone in the organization”* (Harvard Business Review Analytic Services, 2019).

Number of recent studies confirm the impact of organizational culture and knowledge management processes on organizational innovation, which benefits from a strong, flexible and inclusive organizational culture, employee empowerment and participation in decision making (Çakar and Ertürk, 2010; Shahzad and Shahbaz, 2017), and from leadership attitudes towards risk, knowledge, trainings and a favorable work environment (Prange and Pino, 2017). High institutional collectivism, future and humane orientation together with low assertiveness facilitate implementation of new business practices (Bortolotti, Boscari, and Danese, 2015). Alignment between employee and organizational values, psychological safety atmosphere and implementation of employee ideas motivates employees to propose new ideas, while open team communication contributes to creativity (Ali Taha et al., 2016). Improvisation and learning benefits SME innovation capability (Zhang and Merchant, 2019). Knowledge acquisition enhances innovation performance, further positively reinforced by trustful and powerful organizational climate and flexibility, employee commitment and empowerment (Papa et al., 2018). Oyemomi et al. (2019) analyzed the role of organizational culture and knowledge sharing on innovative strategy and organizational performance and concluded that *“knowledge sharing in any organization could improve performance when there is an enabling culture”* (p. 318). Finally, Kahn (2018) suggested the mindset for innovation – both individual mindset and organizational culture – as a contributing factor to a better understanding of and a greater propensity to attain innovation.

While Schumpeter proposed organizational innovation as one of the innovation forms already in 1934, the subsequent literature frequently associated innovation primarily with technological innovation, research and development, and creation of new products (Armbruster et al., 2008; Damanpour and Aravind, 2012). An increasing number of more recent studies analyze

organizational innovation, for instance, Fernandes Rodrigues Alves, Vasconcelos Ribeiro Galina and Dobelin (2018) identified 460 scientific articles published in the period from 2007 to 2016. Yet technological innovation studies still dominate, and recent reviews (Černe, Kaše, and Škerlavaj, 2016; Damanpour et al., 2018) suggest that organizational innovation remains a relatively under-researched type of innovation. Moreover, studies assessing the impact of organizational culture and knowledge management processes on organizational innovation in SMEs are still relatively scarce. Particularly, studies comparing SMEs between industries, studies including micro-enterprises and studies looking at organizational culture through behaviors. McCabe (2002, p. 533) suggested that *“innovation cannot be separated from the context in which it arises and it reveals a tendency to mirror while reshaping organizational condition”* and that *“further research is needed to explore the ways in which older structures, cultures and identities are challenged or reinforced through innovation.”* This thesis identifies and assesses innovation enhancing organizational culture and knowledge management processes via a cross-sectional study of SMEs from various industries in Latvia.

The author argues that Latvian SMEs could benefit from finding ways to leverage their internal factors – organizational work practices, attitudes and knowledge management processes – to introduce organizational innovation in business practices, workplace organization and external relations. And as the empirical evidence from the previous studies suggest, successful implementation of organizational innovation could provide Latvian SMEs a way to foster innovativeness and competitiveness.

### ***Research Object***

Micro, small and medium-sized enterprises (SMEs).

### ***Research Subject***

The impact of organizational culture and knowledge management processes on introduction of organizational innovation.

### ***Research Objective***

The main objective of the doctoral thesis is to assess the impact of organizational culture and knowledge management processes on introduction of organizational innovation in micro, small and medium-sized enterprises, and to develop a conceptual model explaining this impact based on innovation literature analysis and an empirical study of Latvian SMEs.

The doctoral thesis aims to identify organizational behaviors, attitudes, work and knowledge management practices enhancing organizational innovation to provide recommendations for SME senior managers and insights for further SME innovation research.

### ***Tasks to achieve the research objective***

1. Analyze the concept of organizational innovation and explore the influencing factors, particularly at enterprise level.
2. Analyze organizational culture and knowledge management through behaviors and work practices linked to innovation.
3. Conduct an in-depth literature review of the impact of organizational culture and knowledge management processes on innovation, define a framework of organizational culture dimensions and knowledge management processes affecting innovation.
4. Assess and discuss organizational culture, knowledge management and organizational innovation measurement approaches to develop an appropriate research methodology.
5. Develop a conceptual model explaining the impact of organizational culture and knowledge management processes on introduction of organizational innovation in SMEs.
6. Empirically examine the impact of organizational culture and knowledge management processes on introduction of organizational innovation in Latvian SMEs.
7. Analyze data with various statistical methods and explain the results.
8. Validate the findings with insights and previous study results in discussions with managers and practitioners.
9. Derive managerial implications for SME leaders and practitioners on how to enhance organizational innovation.
10. Develop recommendations for future scientific research on how to enhance SME innovativeness through shaping organizational culture and knowledge management practices.

### ***Hypothesis, theses for defense and research questions***

The hypothesis of the doctoral thesis is:

the more a SME is characterized by an innovation enhancing organizational culture and knowledge management processes, the higher the probability of introducing organizational innovation.

Theses for defense:

1. Innovation enhancing organizational culture and knowledge management processes positively contribute to introduction of organizational innovation in Latvian SMEs.
2. The type of implemented organizational innovation and the influencing factors differ between manufacturing and construction, trade and service enterprises.
3. Latvian SME managers consider organizational innovation beneficial for enterprise innovativeness and competitiveness.

From the information provided in the introduction the following research questions arise:

1. What are the main dimensions of organizational culture and knowledge management processes related to organizational innovation?
2. Are there any factors of organizational culture and knowledge management that affect organizational innovation more than others?
3. Do those factors differ amongst micro, small and medium-sized enterprises?
4. Do those factors differ amongst SMEs operating in different industries?
5. To what extent organizational culture and knowledge management factors explain the introduction of organizational innovation in SMEs?

### ***Methodology***

The doctoral thesis uses scientific databases, fundamental literature as well as contemporary scientific research. It includes primary and secondary research methods. It employs various qualitative methods (content analysis) and quantitative methods (a cross-sectional study of more than 600 SMEs in Latvia, grouping, comparisons, frequency analysis, correlation analysis, Chi-Square tests, independent samples t-tests, analysis of variance, cluster analysis and multiple regression analysis).

### ***Research Scope***

The doctoral thesis analyzes organizational innovation in Latvian SMEs. Innovation literature uses different terms to describe organizational innovation, including managerial and administrative innovation. In this doctoral thesis organizational innovation is understood as a non-technological innovation that occurs at organizational level and includes changes in business practices, workplace organization and external relations. Organizational innovation is defined in the first part. The doctoral thesis does not focus on other types of innovation, except when assessing the impact of organizational innovation on enterprise innovativeness.

The doctoral thesis analyses organizational innovation and factors influencing it at an enterprise level; it does not cover public innovation policy and industry- or economy-wide changes and it does not focus on the implications of macro and individual level factors, including individual capabilities of innovation champions. The doctoral thesis addresses characteristics and capabilities of organizations as systems.

The doctoral thesis follows the European Commission Recommendation of 6 May 2003 defining micro, small and medium-sized enterprises - 2003/361, using the staff headcount criteria categorizing as SMEs those enterprises, which employ fewer than 250 persons. The empirical research includes established enterprises, which have been operating at least for a year, without analyzing factors and processes specific to organizational formation and innovative startups. As organizational innovation occurs in all sectors, it includes and compares enterprises from various industries.

### ***Research Assumptions***

The doctoral thesis assumes that organizational culture affects innovative activities of the enterprise. Some previous studies have considered that innovations shape culture in organizations (Birkinshaw, Hamel, and Mol, 2008), and certain work behaviors and practices could develop due to the innovative activities these organizations undertake. For instance, in innovative startups organizational culture could form around the new idea, product or approach of that organization. The doctoral thesis analyzes established enterprises and focuses on the impact of cultural factors and knowledge management processes on innovation, while acknowledging that this impact could work in both directions.

### ***Research Limitations***

The doctoral thesis analyzes the impact of organizational culture through selected organizational behaviors and work practices linked to organizational innovation, developed based on the literature review. The author acknowledges that each enterprise has its own, unique culture, and that organizational culture is much broader than the studied attributes. The doctoral thesis does not aim to holistically explain the organizational culture, it seeks to identify innovation enhancing work organization behaviors and practices that can be assessed using standardized, quantitative surveys. The empirical study is not designed to measure organizational change and innovation over time, and debate of this causality cannot be addressed with the empirical results.

Based on the academic literature review (Armbruster et al., 2008, Gunday et al., 2011; Sakowski et al., 2018; Bodlaj et al., 2018, Damanpour et al., 2018, Arranz et al., 2019), the doctoral thesis assumes organizational innovation as generally beneficial for enterprises. It relies on



enterprise self-reported data suggesting a positive impact on innovativeness and competitiveness. Due to the research design, assessments in the empirical study may be subjective – based on the views of SME senior managers. External data on innovation inputs and outputs is very limited for organizational innovation that primarily concerns internal processes; the subjective nature of measuring organizational innovation outcomes was already noted by Birkinshaw et al. (2008), as well as Cirera and Muzi (2016) - such outcomes can rarely be patented or measured directly, using public data. The study design does not allow to directly match survey results with data of general innovation outcomes – such as the financial data or the number of patents, which are rare amongst smallest enterprises and may not adequately reflect innovations in internal processes. Additionally, a significant time lag exists between introducing an innovation and detecting the outcomes in public data. The research design also implies having a single senior manager’s assessment per organization. It was considered, when developing research questions. However, a broader feedback and multiple responses per organization could help to understand the organizational perceptions more broadly in future studies.

Finally, the empirical research was conducted via a cross-sectional study of economically active SMEs from various industries in Latvia. While the research was conducted in one country, the results are representative to the general population of economically active, at least one-year old SMEs in Latvia, and the author considers that the research conclusions can be generalized and applied to understand, how organizational culture and knowledge management processes affect organizational innovation in SMEs in other small, open economies, particularly in the Central and Eastern Europe and in economies having a large proportion of service enterprises.

***Theoretical novelty:***

1. Assessed organizational culture in Latvian SMEs using a behavior and practice-based approach through a comprehensive, structured content overview in relation to organizational innovation.
2. The conceptual model explaining the relationship between organizational culture, knowledge management and organizational innovation.
3. Developed a method to assess the measure of organizational innovation in SMEs.

***Practical novelty:***

4. Evaluated and condensed patterns of innovation enhancing organizational behaviors derived from the results that can be recommended to managers.

### ***Approbation of the Research Results***

The research results were presented and discussed in 13 scientific publications and 18 international and 4 national scientific conferences (in Cyprus, Croatia, Italy, Latvia, Lithuania, Romania, Serbia, the United Kingdom, Singapore, Sri Lanka and the United States of America):

#### ***Author's scientific publications:***

- Apsalone M. and Šumilo, Ē. (2015). Socio-Cultural Factors and International Competitiveness. *Business, Management and Education*, 13(2), 276–291. DOI0.3846/bme.2015.302, ISSN 2029-7491, **EBSCOhost**
- Baumane-Vītoliņa I., Apsalone M., Šumilo Ē. (2016). Generational Differences in Perception of Values in Post-Soviet Business Environment. *Proceedings of the International Scientific Conference of the University of Latvia “New Challenges of Economic and Business Development - 2016: Society, Innovations and Collaborative Economy”*, May 12-14, 2016, Riga, Latvia, 68-85, **Web of Science (ScienceDirect)**
- Apsalone, M., Baumane-Vītoliņa I., Cals I. and Šumilo, Ē. (2016). Socio-Cultural Change and Generation Diversity in the Post-Soviet Workforce. *Management and Economic Review, Editura ASE. Bucharest, Romania* 1 (2), 109-119. ISSN 2501-885X, **Cabell's International, EBSCO, RePEc**.
- Baumane-Vītoliņa I., Apsalone M., Šumilo Ē. and Jaakson K. (2017). Ethical behavior and honesty in post-Soviet business environment. *Baltic Journal of Management*, 12 (1), 46-62, <https://doi.org/10.1108/BJM-02-2016-0052>, **Emerald**
- Apsalone, M., Cals, I. and Šumilo, Ē. (2017). Managing workplace diversity: ethical reasoning in a socio-cultural context. *New Trends and Issues Proceedings on Humanities and Social Sciences*, 4 (10), 43–54. ISSN 2547-8818. Available from: [www.prosoc.eu](http://www.prosoc.eu). **Crossref, Research Bib, Science Library Index**
- Apsalone, M., Dukeov, I., Baumane-Vītoliņa, I., Šumilo, Ē. and Berķe-Berga, A. (2017). The Impact of Knowledge Management, Learning and Socio-cultural factors on Innovation. *Proceedings of the International Scientific Conference of the University of Latvia “New Challenges of Economic and Business Development – 2017 Digital Economy,”* May 18-20, 2017, Riga, Latvia, 5-15, **Web of Science (ScienceDirect)**
- Apsalone, M. (2017). Building a Resilient Organization – How Culture Can Foster Innovation in Small Businesses. *Proceedings of the 26th International Scientific Conference on Economic and Social Development - "Building Resilient Society"*, Zagreb, Croatia, December 8-9, 2017. Varazdin, ISSN – 1849-7535, pp. 253 – 260, [http://www.esd-conference.com/upload/book\\_of\\_proceedings/Book\\_of\\_Proceedings\\_esdZagreb\\_2017\\_Online.pdf](http://www.esd-conference.com/upload/book_of_proceedings/Book_of_Proceedings_esdZagreb_2017_Online.pdf), **CPCI (Web of Science), ProQuest, EconBIZ, EconLit**
- Apsalone, M. (2018). Effects of Organizational Culture on Organizational Innovation in Small Businesses. *International Journal of Trade, Economics and Finance* 9(1), pp. 41-45 (IJTEF, ISSN: 2010-023X, DOI: 10.18178/IJTEF), **ProQuest, EBSCO, Ulrich's Periodicals Directory**
- Apsalone, M., Flores, R. M. (2018). Ethical Behavior and Organizational Innovation: Analysis of Small and Medium-sized Enterprises in Latvia. *Economics and Business*, 32(1), pp. 183-184, ISSN 2256-0394, **EBSCO, ProQuest, RePEc, Ulrich's Periodicals Directory**

- Dukeov, I., Apsalone, M., Baumanė-Vītoliņa, I., Bergman, J.P., Šumilo, Ē. (2018). A Firm's Organizational Innovation and Organizational Knowledge Management Abilities. *Proceedings of the International Scientific Conference of the University of Latvia "New Challenges of Economic and Business Development – 2018: Productivity and Economic Growth,"* Riga, Latvia, May 10-12, 2018, 177 – 187, [https://www.bvef.lu.lv/fileadmin/user\\_upload/lu\\_portal/projekti/bvef/konferences/evf\\_conf2\\_018/Proceedings\\_2018.pdf](https://www.bvef.lu.lv/fileadmin/user_upload/lu_portal/projekti/bvef/konferences/evf_conf2_018/Proceedings_2018.pdf)
- Dukeov, I., Apsalone, M., Baumanė-Vītoliņa I., Bergman, J.P., Šumilo Ē. (2019). A Firm's Organizational Innovation and Organizational Learning Abilities. *Proceedings of the International Scientific Conference of the University of Latvia "New Challenges of Economic and Business Development – 2019: Incentives for Sustainable Economic Growth,"* Riga, Latvia, May 16-18, 251 – 260, ISBN 978-9934-18-428-4, **Web of Science**.

### ***Monographies***

- Šķiltere, D., Jesiļevska, S., Apsalone, M., Batraga, A., Apsīte, A., Martin Flores, R., Cals, I. and Rūtītis, D. (2017). *Latvijas uzņēmumu konkurētspējas uzlabošanas izpētes starpdisciplinārie aspekti*. Škapars, R. and Šumilo, Ē. (eds). Riga: LU Akadēmiskais apgāds, 120
- Apsalone, M., Apsīte, A., Ābula, M., Baumanė-Vītoliņa, I., Berķe-Berga, A., Dովladbekova, I., Jakobsonė B., Romaša J., Šavriņa B., Šumilo Ē. (2018). *Sociālais kapitāls un darbinieku finansiālā līdzdalība uzņēmuma konkurētspējas un inovāciju veicināšanā*. Dովladbekova, I. and Šumilo, Ē. (eds). Riga: Rīgas Stradiņa Universitāte, 121

### ***Author's presentations in scientific conferences:***

- *Socio-cultural factors and international competitiveness* at the Contemporary Issues in Business, Management and Education, Vilnius, Lithuania. October 12, 2015.
- *The Impact of Socio-cultural factors on International Competitiveness in Small, Open Economies (Sociāli kulturālie faktori un to ietekme uz starptautisko konkurētspēju mazās, atvērtās ekonomikās)* at the 74<sup>th</sup> Annual Conference of the University of Latvia, Riga, Latvia, February 19, 2016.
- *Generational Differences in Perception of Values in Post-Soviet Business Environment* at the New Challenges of Economic and Business Development, Riga, Latvia, May 12-14, 2016.
- *Generational Differences in Perception of Values in Post-Soviet Business Environment* at the Euro-Asia Forum in Politics, Economics and Business 2016, Belgrade, Serbia, July 21-22, 2016.
- *Socio-cultural Change and Generational Diversity in the Post-Soviet Workforce* at the Challenges of Modern Management, Bucharest, Romania, November 3-4, 2016.
- *Employee Motivation, Attitudes, Values and Organizational Culture for Business Competitiveness* at the 75<sup>th</sup> Annual Conference of the University of Latvia, Riga, Latvia, February 9, 2017.

- *Socio-Cultural Factors and International Competitiveness in Small, Open Economies* at the Rīga Stradiņš University Scientific Conference, Riga, Latvia, April 6-7, 2017.
- *Managing Workplace Diversity: Ethical Reasoning in a Socio-cultural Context* at the 6th World Conference on Business, Economics and Management, Kyrenia, Cyprus, May 4-6, 2017.
- *The Impact of Knowledge Management, Learning and Socio-cultural Factors on Innovation* at the New Challenges of Economic and Business Development, Riga, Latvia, May 18-20, 2017.
- *Socio-cultural Factors to Support Knowledge Management and Organizational Innovation: a Study of Small and Medium-sized Enterprises in Latvia* at ICKMI 2017: the 19th International Conference on Knowledge Management and Innovation, New York, the United States of America, October 5-6, 2017.
- *Ethical Behavior and Organizational Innovation: Analysis of Small and Medium-sized Enterprises in Latvia* at the Scientific Conference on Economics and Entrepreneurship - Riga Technical University, Riga, Latvia, October 13, 2017.
- *Effects of Organizational Culture on Organizational Innovation in Small Businesses* at the 7th International Conference on Business and Economics Research, Birmingham, the United Kingdom, October 27-29, 2017.
- *Building a Resilient Organization – How Culture can Foster Organizational Innovation and Competitiveness in Small and Medium-sized Enterprises* at the 26th International Scientific Conference on Economic and Social Development - Building Resilient Society, Zagreb, Croatia, December 8-9, 2017.
- *Organizational Culture and Innovation – Enhancing Small Business Competitiveness in Global Context* at the 76<sup>th</sup> International Conference of the University of Latvia, Riga, Latvia, February 14, 2018.
- *The Role of Organizational Culture in Promoting Innovation of Small and Medium-sized Enterprises in Latvia (Organizāciju kultūras loma Latvijas mazo un vidējo uzņēmumu inovāciju veicināšanā)* at the Scientific Conference of Rīga Stradiņš University, Riga, Latvia, March 22-23, 2018.
- *A Firm's Organizational Innovation and Organizational Knowledge Management Abilities* at the New Challenges of Economic and Business Development, Riga, Latvia, May 10-12, 2018.
- *The Role of Social Capital and Employee Financial Participation for Enhancing Business Competitiveness and Innovation* at the 4<sup>th</sup> World Congress of Latvian Scientists, Riga, Latvia, June 18-20, 2018.
- *Organization 4.1 – the Role of Culture, Values and Knowledge to Promote Small Business Innovation in the 21st Century* at the 16<sup>th</sup> Conference of the International Society for the Study of Work & Organizational Values, Trieste, Italy, July 1-4, 2018.
- *Managing Corporate Culture to Promote Organizational Innovation in Small and Medium Sized Enterprises* at the International Conference on Corporate Governance and Business Ethics – ICC18, Singapore, July 27-29, 2018.

- *Organizational Culture and Small Business Innovation in Small Open Economies* at the 2<sup>nd</sup> International Conference on Multidisciplinary Research - Sustainable Future through Creativity and Innovations, Colombo, Sri Lanka, December 8-9, 2018.
- *Corporate Culture and Organizational Innovation in Small and Medium-sized Enterprises* at the 77<sup>th</sup> International Scientific Conference of the University of Latvia, Riga, Latvia, February 14, 2019.
- *A Firm's Organizational Innovation and Organizational Learning Abilities* at the New Challenges of Economic and Business Development – 2019: Incentives for Sustainable Economic Growth, Riga, Latvia, May 16-18, 2019.

### ***Approbation of the research results***

The research results were discussed in a presentation “*The debate on organizational innovation, knowledge management and culture in small and medium-sized enterprises*” at the Doctoral School of the University of Latvia “*Ensuring the International Competitiveness of the National Economy*” on October 20, 2017.

The empirical research results were discussed in an enterprise seminar “*How organizational culture can foster organizational innovation*” at the Latvian Chamber of Commerce and Industry, February 13, 2018 in cooperation with Dr.sc.adm. Ilona Baumanē-Vītoliņa. Participants: SIA DigiZemgus; SIA SEB Līzings; SIA EHR Mediju grupa; SIA Primum; Balticovo AS; Tilde; Biznesa augstskola Turība; Lattelecom; Nordtext; Creatiwe, SIA; OZOLS IR; Agile & CO; SIA National Export & Trading House Uzbeksitan; Poligrafika, Latvia Tours, Operetes fonds, SIA Crex, LETA SIA, SIA Adllex Group, SIA Transcom Worldwide Latvia, self-employed expert, SIA Revenita, Patentu valde and AS "Grindeks."

While developing the doctoral thesis, the author participated in three scientific research projects:

- project “*Involvement of the Society in Social Innovation for Providing Sustainable Development of Latvia,*” within the National Research Program “*Economic Transformation, Smart Growth, Governance and Legal Framework for the State and Society for Sustainable Development - a New Approach to the Creation of a Sustainable Learning Community (EKOSOC-LV)*”;
- project “*Critical thinking, innovation, competitiveness and globalization*” of the University of Latvia, activity “*Innovation to boost the competitiveness of Latvian companies and industries in a globalized world*”;
- project “*Global Leadership and Organizational Behavior Effectiveness*” by the Social Science Humanities Research Council of Canada and Simon Fraser University, Canada.

### *Content and Structure of the Doctoral Thesis*

The first part of the doctoral thesis covers the fundamental theory of organizational innovation. It defines the terminology, outlines the framework and assesses the factors influencing organizational innovation, explaining the context of organizational behaviors, work practices and knowledge management processes for the further study.

The second part analyzes various aspects of organizational culture and knowledge management and assesses the previous research on the influence on organizational innovation. It proposes the dimensions of organizational culture and explores the cycle of knowledge management related to organizational innovation.

The third part includes results of a cross-sectional study of organizational culture, knowledge management processes and introduction of organizational innovation in more than 600 SMEs in Latvia. It concludes with regression models explaining this influence.

The final part of the doctoral thesis presents the main conclusions and suggestions for practitioners and scientists in accordance with the initially proposed hypothesis and research questions.

The doctoral thesis contains 175 pages, it includes 54 tables and 24 figures.

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# 1. ORGANIZATIONAL INNOVATION – PRINCIPLES, FUNDAMENTAL THEORIES AND INFLUENCING FACTORS

The first part of the doctoral thesis includes a literature review on the fundamental approach towards understanding organizational innovation and the factors influencing it. It focuses on the concept, definition and the framework of organizational innovation from structural and procedural perspectives. The first part also assesses ways to measure organizational innovation. It analyses various factors influencing organizational innovation starting from broader contextual factors and ending with individual level factors. It concludes that organizational culture, knowledge management processes and organizational learning play an important role towards introduction of organizational innovation.

## 1.1 The Concept of Organizational Innovation

### *1.1.1 Conceptualizing and Defining Organizational Innovation*

Innovation is a broad concept. The term originates from a Latin verb “*innovare*” – to make new or to change. Innovation was conceptualized by Schumpeter (1934) through five forms – new products, new production methods, new markets, new supply sources and new forms of organization. The first two could be classified as technical, while new forms of organization - as a non-technical process innovation. Schumpeter initially envisaged a radical innovation with a discontinuous change, thus Schumpeter’s new organization referred to new businesses creating new industries or significantly altering the existing ones (Damanpour, 2014). Schumpeter also made a distinction between an invention and an innovation, proposing that an invention becomes an innovation, when it is commercialized. While not all innovations, particularly non-technical process innovations are commercialized directly, they should create an economic value for the organization. In line with this notion, Drucker (1985) suggested that an invention becomes a resource, when an organization finds an application for it.

A pioneering study by Trist and Bamforth (1951) assessed new ways of organizing within an existing enterprise through innovation in work organization, emphasizing that an organization consists of members and the relationships between them, and concluding that changes in social structures, greater flexibility and employee autonomy following a technological advancement help to increase the productivity. Further studies discussed organizational, administrative and managerial innovation from two approaches - (1) what structures and characteristics make an organization innovative and (2) how organizations develop and change responding to their external environment.



First, Burns and Stalker (1961) explored the relation between management and innovation, distinguishing mechanistic (bureaucratic) and organic management approaches, and suggesting that mechanistic systems are rational for stable conditions, while organic systems - more suitable for change and encouraging a greater commitment. Few years later Thompson (1965) developed a theory for a modern organization and explored the relation between bureaucratic form of organization and innovation. Thompson (1965, p. 2) described innovation as a “*generation, acceptance and implementation of new ideas, processes, products or services*” and considered organization’s capacity to change and adopt as innovation prerequisites. In Thompson’s view, an adoptive organization was not necessarily innovative; however, any innovative organization had to be adoptive. Similarly, Hurley and Hult (1998, p. 44) suggested innovation as an organizational ability to adopt or implement new ideas, processes, or products successfully. Explaining an innovative organization, Kimberly (1981, p. 108) described three forms of innovation – innovation as a process, innovation as an outcome (product, program or service), and innovation as an organizational attribute.

Second, Evan and Black (1967) argued that organizations innovate more frequently under a pressure to adopt to new environments and contrasted technical innovations with administrative - those dealing with organizational change, compensation reviews, acquisitions and mergers. Damanpour and Evan (1984) defined innovation as adopting an idea or behavior that is new to the organization and Damanpour, Szabat and Evan (1989, p. 588) discussed innovations occurring in the administrative component and affecting the social system of an organization. Ettlie and Reza (1992) considered various forms of change to capture the value from innovations – such as new products, processes, services, and organizational forms. Mezas and Glynn (1993, p. 78) defined organizational innovation more radically as a “*nonroutine, significant, and discontinuous organizational change that embodies a new idea that is not consistent with the current concept of organization’s business.*” And Damanpour (1996, p. 994) argued that innovation changes organization either responding to external developments or proactively influencing the external environment, hence innovation encompasses “*new products or services, new process technologies, new or- generational structures or administrative systems, or new plans or programs pertaining to organizational members.*”

The OECD-Eurostat (2005, p. 18) defined organizational innovation as new organizational methods - changes in business practices, in workplace organization or in the external relations that are new to the enterprise. Similarly, Walker et al. (2015, p. 408-409) proposed that organizational innovation is “*the introduction of a new structure, process, system, program, or practice in an organization or its units.*” Hamel (2006, p. 4), on contrary, considered a more disruptive form of innovation as a “*marked departure from traditional management principles, processes, and*

*practices or a departure from customary organizational forms that significantly alters the way the work of management is performed,”* and Birkinshaw et al. (2008, p. 829) defined it as *“the generation and implementation of a management practice, process, structure, or technique that is new to the state of the art and is intended to further organizational goals.”*

Several studies defined organizational innovation through new ideas and knowledge. For instance, Amabile (1988, p. 126) defined organizational innovation as *“successful implementation of creative ideas within an organization”* and Dosi et al. (1988, p. 233) - as an *“intrinsically uncertain activity of search and problem solving, based upon varying combinations of public and private (people specific and firm specific) knowledge, general scientific principles and rather idiosyncratic experience, well-articulated procedures and rather tacit competences.”* Du Plessis (2007, p. 21) defined innovation as *“the creation of new knowledge and ideas to facilitate new business outcomes, aimed at improving internal business processes and structures and to create market driven products and services.”* Baregheh, Rowley, and Sambrook (2009) argued that innovation is a multi-stage process, through which organizations transform ideas into new or improved products or processes. Furthermore, Damanpour and Aravind (2012, pp. 429-432) discussed new approaches in knowledge for management work and new processes leading to changes in the organization’s strategy, structure, administrative procedures and systems.

Organizational innovation includes teamwork, job enrichment, decentralization and continuous improvement (Womack et al., 1990; Armbruster et al., 2008), changes in operations and procedures, responsibilities, accountability, reporting structures and information flows (Wengel et al., 2000), as well as changes in management practices, processes and structures affecting the daily management work at an operational level (Mol and Birkinshaw, 2009). Organizational innovation also includes strategic management activities as new organizational methods in business practices - cross-functional decision making, and managing external relations, as well as human resource management activities, including workplace organization (OECD – Eurostat, 2018).

Organizational innovation is a strategic approach (OECD – Eurostat, 2005), that enterprises introduce to enhance business performance (Hamel, 2006; Mol and Birkinshaw, 2009), innovativeness (Damanpour and Aravind, 2012; Pino et al., 2016; Bodlaj et al., 2018) and competitiveness (Womack et al., 1990). It contributes to organizational renewal and growth as *“Innovation represents the core renewal process in any organization. Unless it changes what, it offers the world and the way in which it creates and delivers those offerings it risks its survival and growth prospects”* (Bessant et al., 2005, p. 1366).

In summary, the new forms of organization - organizational, administrative and management innovation - is generally conceptualized as distinct from product, service, and

technological process innovations. They can be considered innovations in social technologies - operating routines and intangible services (Tether and Tajar, 2008). While there are differences between the three terms – e.g. organizational innovation is broader, while the other two – more specific, administrative innovations tend to focus on managerial skills, and management innovation – on the work of management, the three conceptualizations significantly overlap (Damanpour, 2014). Considering the discussed definitions and approaches, the doctoral thesis uses the term organizational innovation, and the author defines it as “*the implementation of organizational methods, managerial practices and external relations that are new or improved to the enterprise.*”

### ***1.1.2 The Sources of Organizational Innovation***

Innovation can originate from internal and external sources. Drucker (1985) proposed seven sources of innovative opportunities. Four of those include internal sources of an organization or its industry - unexpected successes and failures, process incongruities, process needs, as well as and industry and market structure changes. Three additional opportunities are external – demographic changes, changes in perception, as well as new knowledge.

Internal sources of organizational innovation imply developing and introducing organizational methods, managerial practices and external relations based on those existing in an organization or known in its industry. For instance, managers can introduce new management practices based on knowledge of the existing practices in their enterprise or in similar enterprises, their reference group, thus the innovative activity is affected by contextual factors including size, employee education and international market scope (Mol and Birkinshaw, 2009). Internal sources of organizational innovation can include a need to address the organizational complexity on one hand, and an opportunity to use internal human, financial and research and development resources on the other, leading to larger enterprises, those with more educated employees and those with internal R&D capacity being more likely to innovate (Kimberly and Evanisko, 1981; Mol and Birkinshaw, 2009; Arranz et al., 2019). Enterprises and industries also adopt organizational innovation responding to external regulatory, consumer and social pressures, in particular, implementing quality management innovations to conform to environmental regulations and avoid negative consequences (Aravind, Damanpour, and Devece, 2014).

External sources of organizational innovation include pro-actively assessing organizational methods, managerial practices and external relations in a broader environment beyond the enterprise, its industry and the direct competition. Innovation may frequently require information and knowledge not existing in the organizational context (Damanpour et al., 2018). Thus, managers seek knowledge on new organizational practices above and beyond those known to the

enterprise - the more internal, market-based and professional sources an enterprise interacts with, the more likely an introduction of organizational innovation (Mol and Birkinshaw, 2009). This concept relates to driving markets innovations that proactively shape stakeholders' and competitors' behaviors (Jaworski, Kohli, and Sahay, 2000). Khosravi, Newton, and Rezvani (2019) identified ten external environment drivers for organizational innovation - market dynamics – competition, technology changes, uncertainty, concentration and environmental dynamism; political and legal changes – local legal environment, government effectiveness and union presence, as well as population growth and community wealth.

Complementarities exist between internal and external sources. Cohen and Levinthal (1990) argued that the enterprise's ability to recognize the value of new, external information, integrate it with internal knowledge, and apply in commercialization is critical to its innovative capabilities, and Barbaroux (2012) argued that an innovative organization must be able to leverage the complementarities between internal and external sources of innovation.

Damanpour et al. (2018) considered that due to pressures from competitive and institutional environments, globalization and increasing consumer expectations enterprises need to achieve more with less resources, requiring new knowledge, increased organizational capabilities and refined business processes and systems. Similarly, Khosravi et al. (2019, p. 696) suggested organizational innovation is a *“key concern for an organization's ability to effectively address today's business demands and achieve competitive advantage.”* Three external linkages can have an additional impact on innovation – the ability to use openly available information, the ability to acquire knowledge and technology, as well as active external cooperation on innovation activities (OECD-Eurostat, 2005).

### ***1.1.3 Organizational Innovation and Business Performance Consequences***

While innovation is uncertain, disruptive and does not have clearly predictable implications on business performance, there is a broad consensus that innovation outcomes are generally favorable (Walker et al., 2015). Innovations enhance business performance, contributing to turnover, market share, productivity and efficiency (OECD-Eurostat, 2005).

Schumpeter pioneered the role of innovation towards business performance and economic growth, arguing that enterprises should innovate to be profitable and competitive, and that innovation is a driver of economic change as a *“process of industrial mutation that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one”* (Schumpeter, 1942, p. 83). Following Schumpeter, innovation had a rather marginal role in economic theory, until the existing economic regulation models failed to explain the economic depression in 1970s and economists looked for alternative solutions to address it

(Sundbo, 1998). In 1974, Freeman suggested innovation as an essential aspect for accelerating and sustaining economic growth and welfare (Freeman and Soete, 1997), and in 1988, Dosi et al. argued that technical change is a fundamental force shaping economic transformation. While Schumpeter initially had a broad approach to innovation, the following studies focused mainly on research and development, technology advances and performance benefits associated to introducing new products (Armbruster et al., 2008; Damanpour and Aravind, 2012); consequently, performance benefits of technical innovations may be more frequently discussed and confirmed by the innovation literature. At the same time, a significant number of recent studies analyze and confirm the positive contribution of organizational innovation on business performance in two ways.

First, various forms of innovation complement each other, and organizational innovation can facilitate development or adoption of product, process or marketing innovation, thus enhancing innovativeness. Already the first study on organizational innovation by Trist and Bamforth (1951) looked at creating new responsibilities and social relationships to maximize the benefits of technical change. Organizational innovations and technological innovations complement each other (Wengel et al., 2000). Organizational innovation facilitates efficient use of technical product and process innovations by enabling organizational structures and processes to use these new technologies (Armbruster et al., 2008; Tether and Tajar, 2008), and technological changes can create complex organizational opportunities and challenges, leading to changes in managerial practices and new organizational forms (Lam, 2010). Organizational innovation can improve coordination and cooperation, thus facilitating introduction of other types of innovation (Gunday et al., 2011). Organizational innovation can enhance learning ability and provide access to non-tradable assets, such as external knowledge (OECD-Eurostat, 2005; Merono-Cerdan and Lopez-Nicolas, 2013), as well as foster interaction of internal and external knowledge sources, contributing important ideas (Mol and Birkinshaw, 2009). Organizational innovation also serves as a support mechanism, creating a favorable environment for developing other types of innovation (Pino et al., 2016). And empirical studies indicate that organizational innovation enhances product and marketing innovations (Bodlaj et al., 2018). While early studies (e.g. Damanpour and Evan, 1984; Damanpour et al. 1989) looked at organizational innovation more as a precondition for adopting a technical innovation, later studies consider more simultaneous development of technical and non-technical innovation (Peris-Ortiz and Hervás-Oliver, 2014; Damanpour, 2014), and Sakowski et al. (2018) notes that technological and organizational innovations are complements, but not substitutes for each other.

Second, organizational innovation is an immediate source of competitive advantage, having a significant impact on productivity, quality and flexibility (Womack et al., 1990;

Armbruster et al., 2008). Organizational innovation has a positive effect on firm performance, thus serves as an important and sustainable source for competitiveness (Hamel, 2006; Mol and Birkinshaw, 2009; Arranz et al., 2019). Adopting organizational innovation in response to environmental changes increases the export performance (Gunday et al., 2011; Azar and Ciabuschi, 2017) and improves sales growth (Evangelista and Vezzani, 2010).

To conclude, a significant number of studies recognize positive impact of organizational innovation on implementing other types of innovation, as well as on business performance and competitiveness. And adoption of organizational innovation has become more a necessity than a choice in the disruptive business environment, (Damanpour et al., 2018).

## **1.2. The Framework of Organizational Innovation**

The existing literature discusses different types of organizational innovation, and the author assesses them from a structural and procedural perspective, as well as considering the different organizational ways, how this innovation takes place. Different measurement techniques capture organizational innovation in quantitative studies.

### ***1.2.1 Structural Perspective to Organizational Innovation***

According to Armbruster et al. (2008, p. 646) organizational innovations include all changes in organizational structure and functions; they “*influence, change and improve responsibilities, accountability, command lines and information flows as well as the number of hierarchical levels, the divisional structure of functions [...], or the separation between line and support functions.*” Structural organizational innovations include changes in responsibilities, accountability, reporting structures and information flows (Wengel et al., 2000), generally covers workplace organization innovations defined by OECD-Eurostat (2005), and links innovation to an organizational theory. This approach explains how certain organizational structures can facilitate or hinder organizational innovation in a given situation.

The structural perspective became relevant in innovation literature along with the change from fixed systems in stable environments towards market-oriented systems in changing environments, for instance, the study of Burns and Stalker (1961) dividing organizations into mechanistic, rigid structures and hierarchies in stable environments and organic, more fluid structures, operating in emerging environments. Due to top-down decision making, mechanistic organizations concentrated knowledge at the top-management level, while organic organizations used knowledge from all their networks to increase commitment and expertise. Burns and Stalker concluded that neither type of structure was fundamentally better; however, external environment changes might require certain structural changes.

Boer (2001, p. 87) suggested high centralization, high formalization and low professionalism as organizational conditions favorable to organizational innovation in contrary to the conditions favorable for technical innovation. Decentralization, inclusive decision making and using knowledge from the entire organizational network is not per se always better. Yet, the fast phase of change in most business environments nowadays requires structures that are more organic. Lam (2005) suggested that organizations will shift to more adoptive, flexible and organic structures, as the complexity of technology and product markets increase. Some studies directly suggest such an approach without extensively explaining that very subtle conditions rarely apply to innovation in contemporary business environments. For instance, Caroli and Van Reenen (2001) proposed decentralization of authority and delayering of managerial functions as important organizational changes needed for greater productivity. At the same time others (e.g. Wengel et al., 2000) argue that no one best practice exists in organizational innovation, and the best approach depends on the size, the market, objectives and broader external environment of the organization.

Lawrence and Lorsch (1967) proposed that mechanistic and organic structural types could coexist in a single organization, where sub-structures operate in different ways. Advancing this model further, Tushman and O'Reilly (1996) studied ways, how established businesses expand outside the field of core competence and proposed “ambidextrous organizations”. The hybrid organizations had different capacities for exploiting the established businesses and exploring the new business avenues. Exploitative business structure was mechanistic, and processes focused on efficiency with low risk and high quality, while exploratory business model focused on flexibility, speed, risk taking and experimentation. This concept is linked to business model innovations, combining a method for better addressing consumer needs compared to competitors and an approach to earn income while delivering utility to customers (Johnson, Christensen, and Kagermann, 2008). OECD-Eurostat (2018) suggested three types of comprehensive business model innovations in existing organizations – 1) extending business to new types of products or new markets, requiring new processes, 2) ceasing certain business activities and starting new activities instead and 3) changing business model for existing products through digitalization and other business processes, turning a tangible product into a knowledge-capturing service.

OECD-Eurostat (2005), Camisón and Villar-López (2014), and Walker et al. (2015) considered such structural organizational innovations as a new system of employee responsibilities, cross-functional teamwork, decentralization in decision making, integration or de-integration of departments, flexible job responsibilities, and education and training systems. Merono-Cerdan and López-Nicolás (2017) suggested that workplace organization allow enterprises to directly improve their efficiency, while new business practices and external relations help to obtain other benefits, contributing to further innovation.

Structural organizational innovations also include inter-organizational innovation relationships - new organizational methods in external relations, such as relations with business partners, customers and suppliers, relations with public and research institutions, outsourcing or subcontracting and other activities (OECD-Eurostat, 2005; Armbruster et al., 2008; Camisón and Villar-López, 2014).

### ***1.2.2 Procedural Perspective to Organizational Innovation***

Procedural organizational innovations include new business practices, such as supply-chain management, business re-engineering, knowledge management, lean production, quality management, as well as various processes for improving the working speed and flexibility (OECD-Eurostat, 2005; Armbruster et al., 2008; Camisón and Villar-López, 2014; Walker et al., 2015). Some studies (e.g. Wengel et al., 2000) consider these as managerial innovations affecting organizational routines, operations and procedures as the specifications of the responsibilities, content of reporting and information flows, as well as the way of dealing with information.

Alike the structural perspective to organizational innovation, the procedural perspective emerged through attempts to find better solutions to the rigid processes that could no longer meet the demands of the changing business landscape. Womack's (1990) study of the automobile industry highlighted the global success of lean manufacturing practices in Japan, including several aspects of a lean organization – committed lower level leaders for each of the processes (*shusa*), cross-functional teams created for each project, making internal agreements and aligning communication early in process and simultaneous development, that includes anticipating all process needs in advance. Womack also proposed job enrichment, decentralization of planning, operating and controlling functions, supply value analysis and achieving cost reduction by incremental improvements (*kaizen*), zero buffer principles (*kanban*) and just in time system by production smoothing (*heijunka*).

*“Leanness means developing a value stream to eliminate all waste, including time, and to ensure a level schedule”* (Naylor, Naim, and Berry, 1999, p. 108). Lean approach can introduce significant changes in the workplace organization – it refocuses organization on customer needs, thus gives an opportunity to free resources, redefine external relationships and redesign the way, how value is created. In this context, leanness goes together with agility – *“using market knowledge and a virtual corporation to exploit profitable opportunities in a volatile marketplace”* (ibid). Lean organizations not only gain a competitive advantage through a sharper focus on consumer needs – they are also better positioned to adopt to external environment changes.

Bortolotti et al. (2015, p. 182) considered lean management is a *“managerial approach for improving processes based on a complex system of interrelated socio-technical practices,”* and



suggested such hard lean management practices as setup time reduction, just-in-time delivery, equipment layout for continuous flow, kanban, statistical process control and autonomous maintenance and such soft lean management practices as training employees, top management leadership for quality, supplier partnership, customer involvement and continuous improvement.

Concepts of leanness and agility initially came as best practices that organizations adopted with varying degrees of success, yet, many businesses significantly improved their performance through these concepts (Armbruster et al., 2008). Nowadays, lean principles are common in manufacturing and supply chain management, and they are rapidly expanding to organizations in other fields.

**1.2.3 The Framework and Measurement of Organizational Innovation**

Both structural and procedural organizational innovations can occur within an organization and between organizations (Armbruster et al., 2008; Camisón and Villar-López, 2014), as well as in a broader context as open innovation - *“a distributed innovation process based on purposively managed knowledge flows across organizational boundaries, using pecuniary and non-pecuniary mechanisms in line with the organization's business model”* (Chesbrough and Bogers, 2014, p. 17). Open innovation considers that innovation does not have to be implemented by the organization that created it; new ideas might bring value even if not corresponding to enterprise’s capabilities or the needs of a given marketplace, and a competitive strategy can include the ability to find and adopt existing market solutions to the new needs (ibid). The concept is similar to Walker et al. (2015) consideration of organizations that generate innovation to supply the market.

Table 1.1 outlines the framework of organizational innovation.

**Table 1.1 – The Framework of Organizational Innovation**

		Scope		
		<i>Within an organization</i>	<i>Between organizations</i>	<i>Open innovation</i>
Form	<i>Structural</i>	Cross-functional working groups, Decentralization in decision making	External relations with supply chain and distribution, Outsourcing of business activities	External cooperation networks, cross-sectorial platforms
	<i>Procedural</i>	Quality management Just-in time systems Multitasking Reducing administrative costs	Knowledge transfer Consumer and supply chain management	Using external knowledge and sharing enterprise’s knowledge externally

Source: author’s compilation based on Womack et al., 1990; Budros, 2000; Caroli and Van Reenen, 2001; OECD – Eurostat, 2005; Armbruster et al., 2008, Chesbrough, 2014; Camisón and Villar-López, 2014; Walker et al., 2015

It includes examples of organizational innovation from the literature review structured according to structural and procedural, as well as intra-organizational, inter-organizational, broader (open innovation) categories.

Due to the diverse forms of organizational innovation, innovation management literature considers different measurement approaches. Becheikh et al. (2006), as well as Lhuillery, Raffo and Hamdan-Livramento (2017) distinguished between direct and indirect ways of measuring innovation. When using the direct way, the number of introduced innovations is counted – for instance, the number of new organizational activities. On the other hand, indirect methods assess innovation by measuring innovation inputs - investments, innovative capacity, and outputs, for instance, productivity growth or number of patents. Mol and Birkinshaw (2009) advised that any such performance measures should directly relate to the consequences of introducing the new practices. Cirera and Muzi (2016) also suggested focusing on knowledge capital assets, when measuring innovation, such as computerized information, innovative property, including R&D, and economic competencies, including brands, human capital and organizational capital.

A number of studies (Vickery and Wurzburg, 1998; Coriat, 2001; Wengel et al., 2000; OECD-Eurostat, 2005; Armbruster et al., 2008; Cirera and Muzi, 2016) have identified challenges of measuring organizational innovation in quantitative studies - in particular, the degree of implementation, the novelty and a static measurement of a dynamic process.

Firstly, **the degree of implementation** - many organizational innovation processes are intangible and rather complex. An indicator that measures just, whether an enterprise has implemented a certain organizational innovation in general, has a limited explanatory power – rather researchers could use an indicator measuring the extent to which organizational innovations are implemented (Armbruster et al., 2008).

Secondly, the academic literature has long debated the required level of **innovation novelty**. Schumpeter (1942) already considered the distinction between radical, disruptive innovations and incremental innovations, including continuous development. Kirzner (1973), Bower and Christensen (1995) and Hamel (2006) advanced the concept of disruptive innovation and creative destruction, while Zaltman, Duncan, and Holbek (1973, p. 10) explained innovation as *“any idea, practice, or material artifact perceived to be new by the relevant unit of adoption,”* Van du Ven and co-authors (1986, p. 12) agreed that *“as long as the idea is perceived as new to the people involved, it is an “innovative idea” even though it may appear to others to be an ‘imitation’ of something that exists elsewhere”* and Damanpour (1991, p. 556) suggested innovation as *“the generation, development, and adaption of novel ideas on the part of the firm.”*

Thus, innovation can include state of art changes new to the world, as well as adoption of ideas new to a certain situation or business entity.

Organizations both generate and adopt innovation (Mol and Birkinshaw, 2009; Walker et al., 2015) - generation results in an innovation outcome – new product, service, technology or practice, that the enterprise can use internally or supply the market, while adoption refers to acquiring and using technology, product, policy, or practice for the first time.

An organization inventing and applying a yet unknown practice or method would generate and implement a radical organizational innovation. An organization adopting an established external best practice to enhance its internal processes would implement an incremental organizational innovation, which would be more common in SMEs. The probability of SMEs generating radical innovations on large scale is low, meanwhile it is still important to capture introduction of innovation and knowledge that can lead to subsequent improvement in organizational methods. The approach of “new to the organization” is in line with the recommendation of the Oslo Manual (OECD-Eurostat, 2005, p. 18) and Mol and Birkinshaw (2009), and also applied in this doctoral thesis. Additionally, Armbruster et al. (2008) suggested considering the life cycle of organizational innovation – limiting indicators to recent innovations could incorrectly favor latecomers as more innovative than early adopters.

Thirdly, any **innovation is a dynamic and continuous process** that might be difficult to measure at a static point via a survey, especially when innovation process consists of many incremental changes (OECD-Eurostat, 2005). This issue might be particularly challenging, when measuring organizational innovation in small enterprises with low levels of formalization, where innovation might not have tangible outcomes and might not occur within well-defined organizational processes.

### **1.3. Factors Influencing Organizational Innovation**

After defining the framework for organizational innovation, the author assesses the factors influencing it. Ranging from individual leadership traits and innovative behaviors to broad operating environment, the factors influencing organizational innovation can be categorized in four levels – the first describes individual level factors, the second - organizational level attributes, behaviors and processes, the third – the competitive landscape, and the fourth - broader operating environment.

#### ***1.3.1 Conceptualizing Factors of Organizational Innovation***

Firstly, *individual factors* include individual attributes and behaviors within an organization. The early studies focused on expertise, education, skills and approaches of leaders –

their creativity, worldviews and attitudes towards change (Kimberly and Evanisko, 1981). Later research recognizes that all employees are crucial drivers for innovation (Agarwal, 2014). Thus, individual factors include innovative work behavior - idea generation, idea promotion and idea realization - within an organization (Scott and Bruce, 1994; De Spiegelaere, Van Gyes and Van Hootegem, 2014) and intrapreneurship, a related concept, referring to innovative, proactive and risk-taking behaviors by employees identifying, assessing and exploiting innovative opportunities to advance their organization (De Jong, 2016). Individual level factors include employee creativity as a prerequisite for innovation (Amabile, 1996). Peñalver, Mas, and Fleita (2018) suggested a model for individual innovation competence influenced by five dimensions – creativity, critical thinking, initiative, teamwork and networking.

The second set of factors influencing organizational innovation include those at *organizational level*. Lam (2010) suggested that innovations considerably depend on the organizational structure and internal processes, as the underlying conditions of innovation processes in an organization are social. Kimberly and Evanisko (1981) suggested five organizational factors that impact organizational innovation - the level of centralization, specialization, size, functional differentiation and external integration. Kimberly and Evanisko found centralization beneficial for implementing administrative innovations, at the same time negatively affecting adoption of technological innovations. Specialization contributed to both – technological and organizational innovations, while functional differentiation – to technological innovations. Kimberly and Evanisko found the size of the organization positively linked to innovation performance. Finally, external integration and communications supported innovation adoption process. Damanpour (1991) analyzed 13 organizational determinants of organizational innovation and found statistically significant positive contribution of specialization, functional differentiation, professionalism, favorable managerial attitude toward change, technical knowledge resources, administrative intensity (high proportion of managers), slack resources, and external and internal communication, while negative contribution of centralization.

Smith et al. (2008) conducted a systematic innovation literature review by analyzing 102 previous studies, and proposed nine groups of factors influencing an organization's ability to manage innovation – technology, innovation process (idea generation and effectiveness of implementation), corporate strategy, organizational structure, organizational culture, employees, resources, knowledge management and leadership, proposing a relationship model displayed in Fig. 1.1. Technology, organizational structure, resources and management style and leadership were exogenous factors – considering that they affected the innovation process and were not impacted by other factors in the model.

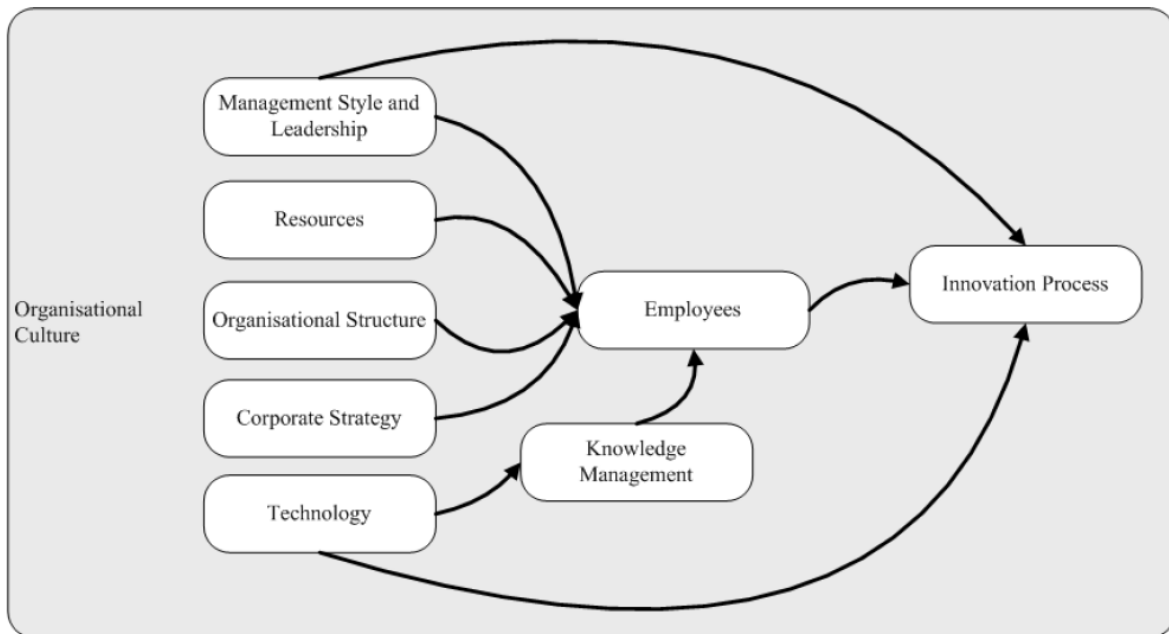


Figure 1.1 – **Relationships between the factors influencing innovation**

Source: Smith et al., 2008, p. 9

Innovation requires certain level of organizational resources - Nohria and Gulati (1996) suggested that too much and too little slack resources can be detrimental for innovation as lack of free resources significantly limits experimentation with uncertain success, while too much slack results in lack of focus and discipline in innovation process, leading to too many initiatives pursued at the same time without a sufficient validation.

Finally, the relationship between organizational structure and organizational innovation could be twofold. Firstly, as per the definition, organizational innovation includes changes in organizational structure (Walker et al., 2015) – for instance, decentralization of organizational functions or reduction of hierarchical levels. Secondly, having a certain organizational structure can enhance organizational innovation and thus make an organization more “innovative.” Earlier research looked for the best way to organize for innovation (Weber, 1947; Chandler, 1962), while later studies consider some organizational structures as more suitable for certain types of strategies and innovation (Teece, 1998; Stathakoulou, 1998), and explore the role of organizational processes, relationships and boundaries (Pettigrew and Fenton, 2000). Consequently, it is important to consider the advantages of a certain organizational structure and relationship between its elements in a given context. For example, greater organizational integration could improve coordination, planning and implementation of centralized innovation activities, while lower number of hierarchical levels in organizational structure could ensure faster decision making and shared responsibility throughout the organization. Khosravi et al. (2019) assessed such structural

considerations for organizational innovation as centralization, standardization, formalization, organizational complexity and distinct functional groups.

The third and the fourth level include *contextual factors* - competitive landscape and forces, as well as broader environment that Drucker (1985) suggested to watch for innovative opportunities.

*Competitive landscape* and industry level factors can be the best described using Porter's Five Competitive Forces model - rivalry among existing competitors can be affected by entrance of new competitors, bargaining power of buyers, emerging substitute products and services, as well as bargaining power of suppliers (Porter, 2008). Competition is a defining market characteristic and can have a substantial influence on innovation, for instance, intense competition, along with a high rate of technological change and high demand for innovation can result in high rate of innovation (OECD-Eurostat, 2018, p. 152). Damanpour et al. (2018) and Khosravi et al. (2019) considered the role of competitive landscape in creating businesses a pressure to implement organizational innovation.

Innovations in a *broader environment* are affected by political, regulatory, macro-economic, social conditions as well as scientific and technological development – organizations should know and understand these external forces (Tang, 1998). Tse and Esposito (2017) suggest demographic and social megatrends of aging populations, emerging power of minorities, scarcer resources and increasing complexity that businesses can face as a threat or proactively use as an opportunity. Globalization and technological developments cause volatility, uncertainty, complexity, and ambiguity (Bennett and Lemoine, 2014), shaping markets and changing competitive landscapes – giving new opportunities for enterprises, who sense and use these changes to their advantage (Doheny et al., 2012). Business environment and ability to foster innovations is subject to macro-economic developments, including such factors as employment, purchasing power of the consumers, financial stability of business partners and accessibility to financing. Political environment can influence business stability and predictability, and regulatory environment can shape industries by favoring or restricting businesses operating in them. Another angle of the regulatory environment includes support and public funding to innovations in a certain context. Considering the natural environment, climate change and environmental awareness of consumers and regulators is another megatrend – it can be a threat to certain ways of doing business and open opportunities for another.

Tushman (1997, p. 15) suggested that enterprises must be able to reorganize and redefine themselves to stay synced with external forces and events. Organizational focus may determine, which factors have a more significant influence on organizational innovation; Budros (2000) concluded that sociocultural factors are more likely to trigger innovation amongst institutionalized

organizations, while *technicoeconomic* factors enhance innovations in efficiency-oriented organizations. Kimberly and Evanisko (1981) proposed such contextual factors as competition and location, claiming that larger competition and bigger cities increase the likelihood of innovation. Tidd and Bessant (2009) proposed a list of contextual factors as potential sources for innovation - watching competitors, applying ideas and solutions in different contexts, design and knowledge driven innovations, accidents and systemic shocks.

The factors influencing organizational innovation are summarized in Fig. 1.2.



Figure 1.2 - Levels of factors influencing OI introduction in enterprises

Source: author's compilation from Kimberly and Evanisko, 1981, Damanpour, 1991, Scott and Bruce 1994, Tang, 1998, Smith et al., 2008, Porter, 2008, Tidd and Bessant, 2009

As Fig. 1.2 demonstrates, a significant number of factors affect organizational innovation at various levels. SMEs are rarely able to control or change the broader contextual environment or the competitive landscape, most often they need to anticipate, use and deal with the change of the external environment. Furthermore, individuals may have strong innovative competences, yet they need an appropriate organizational environment to put forward their ideas. Organizational innovation per definition happens at organizational, at least structural unit or team level. As

Waychal, Mohanty, and Verma (2011) suggested that while innovation is an important competence of individuals, it results from cooperation due to the difficulty of innovating alone. Thus, the primary interest of this doctoral thesis is to assess organizational level factors that could be shaped to increase SME innovativeness.

### ***1.3.2 Categorization and Role of Organizational Level Factors***

Organizational level factors influencing organizational innovation include resources (human, financial, technological, natural, knowledge), organizational design (structure, managing and organizing forms) and strategy - the chosen approach towards achieving goals or, as Porter (2000, p. 3) defines, “*creation of a unique and valuable position, involving a different set of activities.*” They also include the underlying soft factors – organizational behaviors, attitudes and ways of working, the organizational culture, as well as knowledge management and learning within the organization. Organizational level factors are structured in Fig. 1.3.

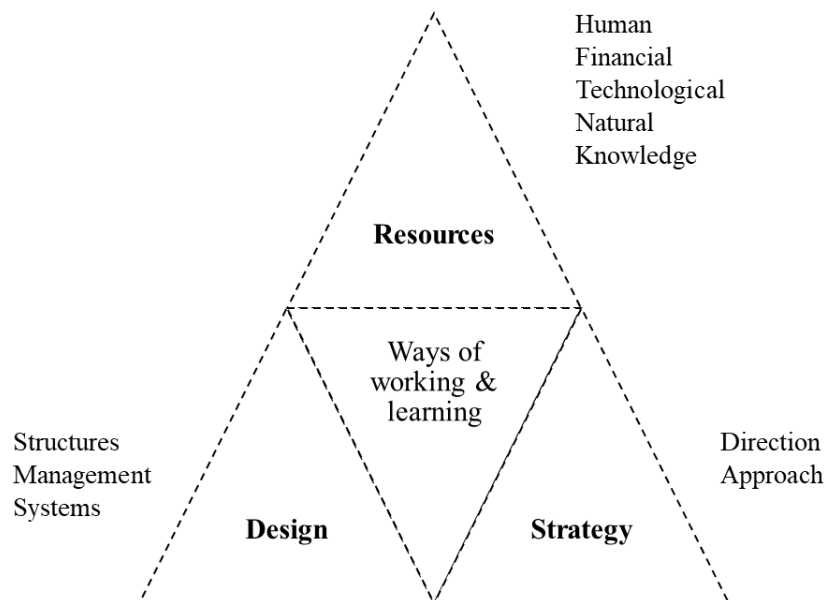


Figure 1.3 – **Organizational level factors influencing organizational innovation**

Source: author’s compilation from Kimberly and Evanisko, 1981, Damanpour, 1991, Smith et al., 2008

Organizational culture is the key factor influencing organizational innovation, “*it is a factor that impacts all others and is also impacted upon by changes in the other factors*” (Smith et al., 2008, p. 14). Birkinshaw, Hamel and MoI (2008) suggested the cultural perspective – assessing how innovations shape and get shaped by cultural conditions inside an organization - as one of key approaches towards organizational (management) innovation.

Organizational culture has direct implications on organizational strategy, as groups’ strategic choices are often limited by the culture of that organization (Schein, 2004, p. 91). Moreover, a change of organizational culture is often required to implement organizational



innovation due to its complexity (Boer, 2001). At the same time, knowledge management and organizational learning contribute to skillsets and abilities of individual employees and to a strategic approach towards building a resilient, innovative organization. As organizational culture and knowledge management affect the way and efficiency of using resources, organizing work, communicating and choosing the strategic direction, they also impact the interaction between the organization and its external environment, subsequently influencing introduction of organizational innovation.

Previous studies confirm that organizational culture contributes to innovation in many ways. A culture oriented towards collaboration, trust and open-mindedness encourages new initiatives and ideas, as positive peer relationships, participation, open communication, and trust facilitate creativity (Hunter, Bedell, and Mumford, 2007). A culture that fosters long-term thinking and understanding of responsibility through collective values, behaviors and practices, contributes to innovation performance (King, 2007; Turró et al., 2014). Culture shapes attitudes towards independence, risk and the power balance (Shane, 1994; Tan, 2002; Alvarez and Urbano, 2012). Culture can impact effectiveness, productivity and welfare (House et al., 2002), as well as the form and effectiveness of leadership (Aktas, Gelfand, and Hanges, 2015). Ethical work culture and organizational behavior could lead to better organizational innovation performance (Apsalone and Flores, 2018). And culture affects productivity through decision making processes, increased organizational resilience and attitudes towards social equality (Throsby, 2001).

Similarly, innovation management literature considers that knowledge management processes contribute to organizational innovation (Prahalad and Hamel, 1990; Grant, 1996; Spicer and Sadler-Smith, 2006; Apsalone, Dukeov, Baumane-Vītoliņa, Šumilo, and Berķe-Berga, 2017). Organizations that effectively absorb external knowledge and intensely circulate it internally are more active innovators (Nonaka and Takeuchi, 1995), and high level of innovation activities can be achieved through building knowledge generation competences (Griese et al., 2012). Innovations in workplace organization are positively impacted by knowledge sharing processes (Merono-Cerdan and Lopez-Nicolas, 2013). Knowledge generation needs, in turn, facilitate developing external relations with other enterprises, research organizations, customers and suppliers (OECD-Eurostat, 2005; Sapprasert and Clausen, 2012). Several studies (Argyris and Schön, 1978; Nonaka and Takeuchi, 1995) also confirm the positive impact of organizational learning on innovation.

Thus, defining and understanding attributes of organizational culture and knowledge management processes that enhance organizational innovation could help to understand, how SMEs could be more innovative. The next part of the doctoral thesis assesses the concepts, building blocks and dimensions of organizational culture and knowledge management and searches for innovation enhancing attitudes, behaviors and processes.

## 2. ORGANIZATIONAL CULTURE AND KNOWLEDGE MANAGEMENT AS INNOVATION ENHANCING FACTORS

After identifying organizational culture and knowledge management processes as the key factors for organizational innovation in SMEs, the second part of the doctoral thesis assesses the concepts, building blocks and proposes sets of organizational attitudes, behaviors and work processes related to organizational innovation.

### 2.1. Innovation Enhancing Organizational Culture

#### 2.1.1 Defining Organizational Culture

Culture is a complex social phenomenon, which can have different meanings, depending on the context and the perspective. Understanding of organizational culture emerges from the anthropological approach, where Tylor (1871) first defined culture as a holistic concept that includes knowledge, beliefs, art, morals, law, customs, as well as other capabilities and habits acquired by humans in social interactions (Tylor, 1871, in Kroeber and Kluckhohn, 1952, p. 43). Thus, culture consists of learned attributes and practices - customs, habits, morals, traditions and usages. In 1952, Kroeber and Kluckhohn analyzed over 160 definitions of culture and described it as a dynamic system that, on the one hand, results from human actions, and, on the other hand, conditions elements for further action (Kroeber and Kluckhohn, 1952, p. 181). They also concluded that “*cultures are distinct yet similar and comparable*” (ibid, p. 179). Thus, cultures differentiate organizations, at the same time share common content and patterns and can be compared to each other.

Some definitions focus on the uniqueness of culture, differentiating one organization from others:

- Hofstede defined organizational culture as the “*the collective programming of mind that distinguishes the members of one organization from others*” (Hofstede, Hofstede, and Minkov, 2010, p. 344);
- Turnstall (1983, p. 1) described it as “*a general constellation of beliefs, mores, value systems, behavioral norms and ways of doing business that are unique to each corporation*”
- Bik (2010, p. 72) considered that culture distinguishes one group from another based on a certain set of values, beliefs, behaviors, and attitudes; which is shared, interpreted, and transmitted within the group over time.

Meanwhile the last definition, along with others emphasize the patterns cultures share:

- Louis (1980, p. 227) defined culture as *“a set of common understandings for organizing actions and language and other symbolic vehicles for expressing common understandings”*
- Schwartz and Davis (1981., p. 33) defined culture as *“a pattern of beliefs and expectations shared by the organization’s members.”*
- Schein (2004, p. 17) described culture through shared behavioral interactions, norms, values, philosophy and guiding ideological principles, embedded skills, mindsets, meanings, rituals and celebrations as *“a pattern of shared basic assumptions that was learned by a group as it solved its problems of external adaption and internal integration that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems.”*
- Trompenaars and Hampden-Turner (1997, p. 3) defined culture as *“the shared ways groups of people interpret the world.”*

Definitions frequently refer to organizational culture as a set order or a system. For instance, Hurley and Hult (1998, p. 47) proposed culture as a *“system of beliefs in which actors internalize some meaningful order with respect to the organization,”* while, Groysberg, Lee, Price, and Cheng (2018, p. 4) as *“the tacit social order of an organization”*.

Number of definitions emphasize the learned nature of organizational culture (Louis, 1980; Hofstede, 1980; Schein, 2004) - group members pass cultural elements on to new members, who learn culture through socialization process. According to Hofstede (1980, p. 16), culture is learned and specific to a group or a society; it stands between the universal and inherited human nature and individual personalities. Similarly, Schein (2004, p. 17) considered culture through accumulated and shared group’s learnings, including behavioral, emotional and cognitive elements of its members psychological functioning.

Hsieh, Lange, Rodin, and Wolf-Bauwens (2018, pp. 161-162) suggested that organizational culture is a social, collective phenomenon, concerns values, is related to action, is scalar – can be developed to differing degrees, and it is multi-layered.

Individuals simultaneously belong to several organizations and cultures. Hofstede et al. (2010) emphasized the difference between national cultures containing the basic values, which individuals acquire early in childhood, and organizational cultures, consisting primarily of organization’s practices, which individuals join as adults. Furthermore, Schein (2004, pp. 35 - 119) argued that individuals do not develop new assumptions, behaviors and values for each organization they join - they bring in previous cultural learning to a group, and their identities are not defined exclusively by any of those organizations.

Finally, organizational cultures change and can be changed over time. Schein (2004) suggested that culture develops in two ways – it either emerges from unstructured and spontaneous group interactions that gradually result in development of norm patterns, or it emerges through intentional process of cultural transformation.

### ***2.1.2 Conceptualization of Organizational Culture in Innovation Studies***

As the previously discussed definitions suggest, cultures share patterns of assumptions, values, beliefs, meanings, attitudes, expectations, norms, behaviors and actions. Some of these patterns are more visible and easier to observe, while others – more internally implied and intangible. Commonly referred layers of organizational culture include shared underlying assumptions, values and norms, as well as visible behaviors, practices and artefacts (Schein, 2004; Homburg and Pflesser, 2000; Palermo, 2011; Dauber et. al, 2012).

The deepest cultural layer includes implicit, underlying assumptions - beliefs, perceptions, thoughts and feelings that are non-confrontable and taken for granted; these assumptions do not have to be rationalized and guide other perceptions and behaviors (Argyris and Schön, 1974; Schein, 2004). Shared basic assumptions could provide the most meaningful insight, however, are unconscious, unchallenged and difficult to articulate (Oyemomi et al., 2019).

The middle layer includes values - *"a conception, explicit or implicit, distinctive of an individual or characteristic of a group, of the desirable which influences the selection from available modes, means and ends of action"* (Kluckhohn, 1951, p. 395, in Hills, 2002, p. 4) – as well as beliefs, strategies, goals, philosophies and norms. Kluckhohn and Strodtbeck (1961) suggested that groups are more likely to follow dominant value orientations, when considering alternatives to a limited number of common human problems. Hofstede et al. (2010) argued that values drive practices, and Schein (2004) suggested that values undergo a social validation confirmed by shared experiences, and the values that work for the organization gradually become a part of its assumptions.

Values and beliefs are more measurable than shared assumptions, and value-based frameworks are commonly used to assess organizational culture (Chatman and Jehn, 1994; Javidan, House, Dorfman, Hanges, and De Luque, 2006; Khazanchi, Lewis, and Boyer, 2007). One of the main challenges of assessing culture through values are potential lack of a common understanding and action associated with the same value (Stock, Six, and Zacharias, 2013). Thus, conceptualizing organizational culture through values is meaningful, when there is a high value congruence - consensus about organizational values amongst members (Chatman and Jehn, 1994; Khazanchi et al., 2007). Additionally, when values are simply declared and not based on prior learning of the organization, such values reflect only rationalization, aspirations or “espoused

theories” – they predict, what members of organization will say, but not what they will do (Argyris and Schön, 1978). This relates to value-practice interactions by Khazanchi et al. (2007), suggesting that practices may reinforce or contradict the values, with the last giving mixed signals to the organization, for instance, when empowerment is declared yet not enacted by the managers and not perceived by the employees. The GLOBE study by House et al. (2004), in fact, found a significant negative correlation between cultural values and practices in most of the cultural dimensions assessed. Thus, number of studies consider conceptualization of organizational culture more holistically, considering also more relatable and tangible aspects – practices (Javidan et al., 2006) and artefacts (Stock et al., 2013).

The observable layer includes artefacts, behaviors, practices and processes (Homburg and Pflesser, 2000; Schein, 2004). Artefacts refer to stories, arrangements, rituals, and language, while behavior includes “*organizational behavioral patterns with an instrumental function*” (Homburg and Pflesser, 2000, p. 450). Organizational structures, cultural practices and behaviors constitute the observable manifestation of organizational values and strategies (Schein, 2004; Dauber et. al, 2012). Strategies influence the interaction between structures and behavior, while the behavior influences values in turn (Dauber et. al, 2012).

Number of studies concerning innovation assess organizational culture through organizational behaviors and practices (Chandler et al., 2000; Sharifirad and Ataei, 2012; Shahzad et. al, 2017; Oyemomi et al., 2019; Alofan, Chen, and Tan, 2020). Moreover, Stock et al. (2013) considered that innovation-oriented artifacts could serve as channels transmitting influence of abstract innovation-oriented values and norms. As the doctoral thesis aims to identify and explore innovation enhancing aspects of organizational culture by quantitative means, it looks at patterns of organizational behaviors and practices as more tangible, observable and interpretable manifestations of organizational values that are enacted.

Some of such shared patterns are common in organizational climate research, which preceded organizational culture research mainly in the field of psychology and was concerned with social and behavioral perception of an organization by its members (Hsieh et al., 2018). For instance, the frequent patterns of behavior, attitudes and feelings that displayed, experienced and understood in the daily environment of the organization (Imran, Saeed, Anis-Ul-Haq and Fatima, 2010), or organizational environment, that fosters creative, innovative employee work behavior (De Jong, 2016). Even though organizational culture studies developed separately from organizational climate studies, Denison (1996) emphasized that both deal with collectively defined social context, created by interaction and at the same time defining it, and both consider multiple layers and largely overlapping dimensions in quantitative analysis, while Treviño et al. (1998) concluded that ethical culture and ethical climate are strongly related in organizational context.

Along with Denison (1996), Treviño et al. (1998) and Hsieh et al. (2018), the doctoral thesis considers both constructs – organizational culture and organizational climate - as largely congruent and includes also innovation enhancing cultural characteristics and behaviors that some studies associate with organizational climate.

Organizational culture can be assessed using three approaches – dimensions approach that measures organizational culture along defined scales, interrelated structure approach that links organizational culture to other organizational constructs and characteristics, as well as typology approaches dividing organizations in certain clusters (Dauber et al., 2012). In order to define the aspects of organizational culture for measurement, the next parts assess dimensions and archetypes of organizational culture, which will be linked to broader organizational constructs and characteristics.

### ***2.1.3 Dimensions of Organizational Culture and the Impact on Innovation***

The dimensions approach is one of the most prominent ways to assess cultural constructs in quantitative research (Dauber et al., 2012, p. 3). The first fundamental theories proposing cultural dimensions consisting of mutually comparable cultural characteristics, were developed by Parsons and Shils (1951), Kluckhohn and Strodtbeck (1961) and Hall (1959, 1966 and 1976).

Parsons and Shils (1951, p. 77) looked at cultural elements as constituents of system of action and suggested five patterns. The first pattern - affectivity – affective neutrality - determines, whether evaluation takes place in a given situation. The second pattern - self-orientation – collectivity orientation determines primacy of moral standards in the evaluation process; it describes the degree of integration in a society. The third pattern - universalism – particularism - deals with cognitive and cathectic standards, determining whether a universal approach or an assessment of each individual situation prevails. The fourth pattern - ascription – achievement - addresses the quality and performance dilemma. Finally, the fifth pattern - specificity – diffuseness - considers the significance of a given object and to what extent a broader context should be considered. Parsons and Shils suggested that these five patterns affect action at four different levels – implicit or explicit individual choices, individual habits – value orientation standards, rights and duties in a society, as well as value standards of a culture, and suggested these patterns as useful tools for both – characterizing the normative culture, as well as the actual behavior.

Kluckhohn and Strodtbeck (1961) suggested five core dilemmas that culture should address via the dominant value orientations (Trompenaars and Hampden-Turner, 1997, p. 26, Hills, 2002, p. 4):

- past, present or future focus (time orientation);

- relationship between humanity and its natural environment – mastery, submission or harmony (man-nature orientation);
- how individuals relate to others – hierarchically (lineal), equally (collateral) or according to their individual merit (individualistic) (relational orientation);
- the prime motivation for behavior – being, growing or doing (activity orientation);
- character of human nature – good, evil or a mixture (human nature orientation).

The dimensions defined by Parsons and Shils were further developed in empirical, cross-cultural research by Trompenaars and Hampden-Turner (1997) using a large-scale quantitative survey of 8841 managers and organization employees from 43 countries. Trompenaars and Hampden-Turner renamed “self-orientation – collectivity orientation” as “individualism vs. communitarianism” and “affectivity – affective neutrality” as “neutral vs. emotional”. They also proposed dimensions “attitude towards time” and “attitude towards environment,” to some extent relating to two of the core dimensions proposed by Kluckhohn and Strodtbeck (1961).

Meanwhile, Hall (1959, 1966 and 1976) defined three fundamental cultural dimensions through attitudes towards time, space and context. *"The Silent Language"* assessed culture through communication patterns and time, proposing three different forms of communication and rhythms - informal, formal and technical, which, in turn, are influenced by order, selection and relevance (Hall, 1959). Hall suggested a similar structuring for time - there is a certain degree of formality in access to it, there is a certain sequence, value and "tactility" (ibid). In monochrome cultures, time has a strict order and a great value; the approach is linear, and the tasks are done sequentially, depending on their priority. In polychronic cultures, time is less formal, and many processes can take place simultaneously. *"The Hidden Dimension"* explained attitude towards social and personal space; Hall (1966) noted that the notion of spacing and distance is natural; personal distance allows to keep a certain no-contact territory, while social distance allows to keep a certain community together. He also observed that the usual communication and interaction distances between different cultures significantly differed. Distance is closely linked to engagement and awareness of privacy. Thirdly, *"Beyond Culture"* looked at high-context cultures, where unwritten prerequisites exist, and messages are implicit; their proper perception and interpretation requires knowledge and understanding of the whole situation, and low-context cultures, which clearly define the expected behavior, and communication is direct (Hall, 1976). Context allows individuals to understand the situation based on previous experience. Contextual cultures are more closed, giving more meaning to affiliation and making it harder to join. In low-context cultures, the links between individuals are less intense. The contextual dimension closely relates to specificity – diffuseness proposed by Parsons and Shils (1951).

While the aforementioned frameworks proposed cultural dimensions based on theory, in 1967 Hofstede took another approach establishing cultural dimensions through factor analysis examining the results of a worldwide survey of IBM employees (Hofstede et al., 2010), gradually developing six cultural dimensions:

- power distance - the extent, to which the less powerful members of organizations and institutions accept and expect that power is distributed unequally;
- individualism vs. collectivism – the degree of social integration into groups;
- uncertainty avoidance – the tolerance for ambiguity;
- masculinity vs. femininity – orientation towards achievement vs. equality and quality of life;
- long-term orientation vs. short-term orientation;
- indulgence vs. restraint – attitudes towards happiness and joy.

Later Hofstede developed six dimensions specifically for organizational culture – process oriented vs. results oriented, employee oriented vs. job oriented, parochial vs. professional, open systems vs. closed systems, loose vs. tight control and normative vs. pragmatic. The first contrasts concern of means to concern of goals. The second contrasts human concerns to job concerns. The third compares, whether people get their identity largely from organization or from the type of job. The fourth considers the openness of the organizational system to outsiders. The fifth explains internal structuring. The sixth considers customer orientation – whether the culture is more pragmatic – market driven, or normative – which concerns implementation of inviolable rules (Hofstede et al., 2010).

Maruyama (1974) considered cultural differences in reasoning and distinguished between 1) hierarchical, unilateral and universalistic; 2) individualistic and 3) contextual, mutualistic and interactive cultures.

Schein (2004) proposed cultural dimensions based on Parsons and Shils (1951), as well as Kluckhohn and Strodtbeck (1961), considering the nature of:

- reality and truth – determining or discovering, what is real, and the sufficiency of information to act. External, physical reality can be determined empirically, social reality relates to group consensus, identification and the relation between members. In individual reality, the personal experiences are absolute truth for the individual, while not necessarily shared by others;
- time – an organizational orientation to past, present, near or distant future;
- space – closely linked to the nature of time, strictly organized to avoid wasting time, or making special arrangements that allow simultaneous events to occur;



- human nature – the intrinsic or ultimate human attributes, predictability, organizational assumptions for employees;
- human activity - the right decision and course of action in relation to environment; doing, being and being-in-becoming orientation;
- human relationships – the right way for people to relate, cooperation and competition, authority and consensus, dealing with conflict, identity and role in the group, power and influence, needs and goals, as well as acceptance and intimacy.

Finally, GLOBE (Global Leadership and Organizational Behavior Effectiveness) – a multi-phase, cross-cultural research study assessed cultures through nine dimensions (House et al., 2004). Five of those relate to Hofstede’s dimensions: uncertainty avoidance, power distance, future (long-term) orientation, assertiveness, gender egalitarianism (femininity) and societal collectivism. GLOBE additionally considered institutional collectivism, describing trust in institutions, performance orientation – the degree, to which societies emphasize performance and achievement, as well as humane orientation – the extent, to which societies place importance on fairness, altruism, and caring.

Dimensions from various cultural frameworks can be divided in six groups - contextual consideration, time orientation, space orientation, perception of human nature, activity and result orientation, as well as relational orientation (Table 2.1).

Table 2.1 - **Dimensions of Organizational Culture**

<b>Dimension</b>	<b>Factors from cultural frameworks</b>
Contextual consideration	Specificity – diffuseness (Parsons and Shils, 1951), Unidirectional and mutual causal cultural paradigms (Maruyama, 1974), Uncertainty avoidance (Hofstede et al., 2010; House et al., 2004) High-context – low context cultures (Hall, 1977), Nature of reality and truth (Schein, 2004) Open systems vs. closed systems, normative vs. pragmatic (Hofstede et al., 2010).
Time orientation	Past, present or future (Kluckhohn and Strodtbeck, 1961, Hampden-turner and Trompenaars, 1997) Monochronic vs. polychronic time (Hall, 1959, 1966, 1977, Hampden-Turner and Trompenaars, 1993) Long-term orientation vs. short-term orientation (1967/2010; House et al., 2004); Planning time and development time (Dubinskas 1988), Past, present, near or distant future (Schein, 2004).
Space orientation	Intimacy, personal, social and public distance (Hall, 1966) The nature of space (Schein, 2004)
Perception of human nature	Human nature orientation (Kluckhohn and Strodtbeck, 1961) The nature of human nature (Schein, 2004)
Activity and result orientation	Activity orientation (Kluckhohn and Strodtbeck, 1961), The nature of human activity (Schein, 2004), Process vs. results, employee vs. job orientation (Hofstede et al., 2010). Performance orientation (House et al., 2004)
Relational orientation	Relational orientation (Kluckhohn and Strodtbeck, 1961) Individualism vs. collectivism, power distance (Hofstede et al., 2010; House et al., 2004) Loose vs. tight control (Hofstede et al., 2010), Individualism vs. communitarianism, neutral vs. emotional (Hampden-Turner and Trompenaars, 1997), Self vs. collectivity, affectivity – affective neutrality (Parsons and Shils, 1951), The nature of human relationships - cooperation vs. competition, authority and consensus (Schein, 2004). Assertiveness, gender egalitarianism, societal collectivism, institutional collectivism, humane orientation (House et al., 2004)

Source: author’s summary based on Parsons and Shils 1951, Kluckhohn and Strodtbeck 1961, Hall 1959, 1966, 1977, Hofstede et al., 2010, Maruyama 1974, Dubinskas 1988, Hampden-turner and Trompenaars 1997, Schein 2004 and House et al., 2004.

**Contextual consideration** distinguishes between high-context and low-context cultures, as defined by Hall (1977) and unidirectional vs. mutual causal cultural paradigms defined by Maruyama (1974). In low-context, unidirectional cultures things and events have clear universal meanings, in high-context, mutual causality cultures events can be understood only in context, meanings can vary, and causalities cannot be clearly established (Schein, 2004). This dimension also relates to uncertainty avoidance described as the degree of comfort, when facing ambiguity by Hofstede et al. (2010) and as “*the extent to which members of an organization or a society strive to avoid uncertainty by reliance on social norms, rituals, and bureaucratic practices to alleviate the unpredictability of future events*” by House et al. (2002, p. 5). Risk-taking reflects uncertainty acceptance in an original activity and resource commitment to uncertain outcomes and activities (Hughes and Morgan, 2007), that is often a pre-requisite for innovation process.

Cultures that embrace uncertainty more easily can be more adaptive (Schein, 2004). Higher risk tolerance in certain managerial areas can increase organizational effectiveness (Davis and Davidson, 1991; Pascale and Athos, 1981; Peters, 1987). Shane (1995) confirmed that managers in uncertainty accepting societies are more likely to become innovation champions than those from uncertainty avoiding societies. Risk-averse enterprises may fail to capitalize on changing market needs (Hughes and Morgan, 2007). Similarly, Alvarez and Urbano (2012) confirmed that risk-taking is positively related to entrepreneurship. High levels of risk-taking, on the other hand, imply a higher likelihood of failure, thus moderate levels of risk-taking might be the best for SME performance (Miller and Leiblein, 1996).

SMEs must be able to face uncertainty and tolerate at least moderate degree of risk, as it originates from the rapidly changing external environment. Taking high, uncalculated risks, on the other hand, may drain the resources needed for organizational survival.

***Time orientation*** has a central role, as all organizations and cultures have assumptions about the nature of time and have basic orientations towards the past, present or future (Kluckhohn and Strodtbeck, 1961; Hampden-Turner and Trompenaars, 1997; Schein, 2004). Organizations can be primarily oriented towards the past, considering how things used to be; the present, primarily considering immediate tasks, as well as future. Future orientation can be defined as “*the extent to which individuals in organizations or societies engage in future-oriented behaviors such as planning, investing in the future, and delaying gratification*” (House et al., 2002, p. 6). Schein (2004) proposed a distinction between focusing on results in near future vs. investing in distant future research and development at the expense of immediate profits. Innovation almost always require considering future and committing resources towards future goals. Gupta (2011) suggested that future oriented operational strategies help to develop performance focused resources and capabilities. Moonen (2017) found future orientation having a positive impact on innovative strength.

Organizational assumptions about monochronic and polychronic time, defined by Hall (1959, 1966, 1977) and Hampden-Turner and Trompenaars (1997), affect the importance of planning in the management process – some organizations are more focused on sequential approach, while others – on synchronization of activities. Bluedorn (2002, p. 51) defined polychronicity as “*the extent to which people (1) prefer to be engaged in two or more tasks or events simultaneously and are actually so engaged (the preference strongly implying the behavior vice versa) and (2) believe their preference is the best way to do things.*” Dubinskas (1988) made a distinction between planning time, setting targets in a monochronic way, and development time with never-ending and open-ended processes, having their own, internal time cycles. Onken (1999) concluded that polychronicity was positively related to the degree to which an organization valued

speed and with some aspects of organizational performance. Schein (2004) suggested monochronic time more suitable for large systems and highly coordinated actions, while polychronic approach - for building relationships and solving complex problems. Thus, new, small organizations could benefit from a polychronic approach that would promote open and creative decision making, while larger, more established organizations could benefit from a monochronic approach that would allow a better coordination.

**Space orientation** can be analyzed from different perspectives. Hall (1966) distinguished between intimacy, personal, social and public distance, according to which physical characteristics can have a symbolic meaning in a cultural setting – for instance, closed offices ensure privacy. Schein (2004) considered that placement in relation to others symbolizes status, social distance and membership; organizations can symbolize important values and assumptions through design. Space and time considerations also affect interpersonal interactions and communication methods.

**Perception of human nature** affects the perception of organizational members. Kluckhohn and Strodtbeck (1961) proposed that societies see humans as evil, good or neutral – capable of being their good or bad. According to Schein (2004, p. 172) within the Western tradition, humans are rational-economic actors with social needs, problem solvers and self-actualizers, who need to be challenged and to use their talents, as well as complex and malleable. In this context, human nature depends on social conditions and employees can learn behavior from organizational norms and the approaches taken by their leaders.

**Activity and result orientation** distinguish the focus between doing and being. Kluckhohn and Strodtbeck (1961) proposed that doing orientation assumes a controllable environment and predictable action, while being orientation – nature superiority. Organizations driven by doing orientation focus on task, efficiency, growth and dominance, while those driven by being orientation look for niches and adopt to external realities (Schein, 2004). The third being-in-becoming orientation “*emphasizes that kind of activity, which has its goal the development of all aspects of the self as an integrated whole*” (Kluckhohn and Strodtbeck, 1961, p. 17). This dimension includes organizations orientation towards performance, defined as “*the degree to which a collective encourages and rewards group members for performance improvement and excellence*” (House et al., 2002, p. 6) – an aspect that has a very strong positive impact on innovative strength (Moonen, 2017). Activity and result orientation also relates to an organization’s external economic and market environment.

**Relational orientation** covers a broad range of aspects determining interrelations and interactions within an organization. Power distance, proposed by Hofstede et al. (2010) affects the

hierarchy, formality, as well as division of tasks and accountability between individuals and teams. Very hierarchical organizations either have very concentrated decision making, which may limit creativity and new ideas, or a very bureaucratic structure of decision making, which would not be agile and may fail to adopt to external changes in a timely manner. Moonen (2017) found large power distance having a negative impact on innovative strength.

Relational orientation also includes organizational orientation towards individualism vs. collectivism, determining the primacy of interests and the basic building blocks of a society or an organization (Hofstede et al., 2010; Hampden-Turner and Trompenaars, 1997; Schein 2004). This, in turn, has implications on cooperation vs. competition, authority and consensus (Schein, 2004). In collectivistic context a cross-functional support is required for the innovation effort (Shane, 1994). Morris, Davis, and Allen (1994) concluded that formal organizations tend to have a collectivizing impact on employee's attitudes and behaviors, and that entrepreneurship declines with increasing levels of collectivism. They found two implications for organizations – firstly, managing the collective and individual balance in decision making, structures, reward and evaluation systems, human resource management, and administrative policies and procedures. Secondly, understanding that while team performance is essential in most of organizations, individuals should have the incentives and autonomy to identify opportunities and champion innovative products and processes (ibid). Alvarez and Urbano (2012) researched, whether independence positively impact entrepreneurial activity along with risk taking and creativity; however, did not come to any statistically significant conclusion. Chandler et al. (2000) analyzed organizational culture in 429 SMEs and concluded that management supervision and rewards systems contribute to an innovation enhancing organizational culture.

These dimensions characterize goals and structures, behavioral norms, rules and practices of interactions within organizations.

#### ***2.1.4. Cultural Archetypes and Organizational Innovativeness***

The previously discussed dimensions of organizational culture tend to be interlinked, and organizational cultures can be positioned, considering few dimensions – usually context, time, activity and relational orientation – thus creating the cultural archetypes. “*Organizations are ultimately the result of people doing things together for a common purpose*” (Schein, 2004, p. 191) - cultural archetypes indicate the relationship between the individual and an organization, between individuals within an organization, as well as the main purpose of the organization.

Organizational culture studies frequently establish organizational archetypes or orientations based on the competing values framework by contrasting people vs. task focus on one hand and hierarchy, control vs. equality, flexibility on the other.

An early framework was proposed by Harrison (1972) and further developed by Handy (1993), identifying four organizational orientations: power, role, task and person orientation. According to that framework, a power culture characterizes an organization with a centralized power source that tends to control the environment and make decisions politically rather than bureaucratically. A role culture characterizes a bureaucratic organization with an emphasis on structural and functional specialization, process formalization, hierarchy and status; however, the organizing principles are logical and rational. Such organizations tend to be stable, yet slow and difficult to change. A task culture characterizes an achievement-orientated organization, where structure, functions and activities are measured against the contribution to a superior goal. Effective problem solving is higher than the ideological commitment towards authority, respectability and order. Task culture might frequently characterize a sub-structure of a larger organization, such as a project team. Finally, the main purpose of a person-oriented organization is to address the needs of its members. Such organizations rarely have a formal authority and prefer decision making with consensus.

Quinn and Rohrbaugh (1981) assessed the impact of competing organizational values on organizational effectiveness using a three-dimensional model. The first set of competing values related to organizational focus from well-being of individual members to well-being of the organization itself. The second set of competing values related to flexible or stable organizational structure. The third set of competing values related to emphasis on processes and procedures versus outcomes. In the result, Quinn and Rohrbaugh proposed four cultural models - open systems, rational goal, internal process and human relations model. Quinn and Rohrbaugh developed their framework further in 1983, suggesting that organizations concentrating on individual members focus on internal concerns and harmony, while those concentrating on well-being of the organization itself have an external focus on competitiveness. Denison and Spreitzer (1991) applied the competing values approach, creating four archetypes - developmental, rational, hierarchical and group culture.

Tian, Deng, Zhang and Salmador (2018) conducted a systematic literature review on the influence of culture on innovation between 1980 and 2017 and found the Competing Values Framework as one of the most commonly used theoretical models. For instance, Brettel, Chomik, and Flatten (2014) used this framework to assess the impact of organizational culture on entrepreneurial orientation (innovativeness, proactiveness and risk-taking) in SMEs, and concluded that developmental, group, and rational culture had a strong positive impact on entrepreneurial orientation, while hierarchical culture had a negative impact.

Trompenaars and Hampden-Turner (1997) analyzed the effect of culture on management and developed a similar framework, contrasting equality-hierarchy and person-task orientation to

distinguish four types of organizational culture – the family, the Eifel Tower, the guided missile and the incubator. Trompenaars and Hampden-Turner described the family culture as close and personal, at the same time hierarchical and power-oriented. Family-style organizational cultures tend to be high-context with defuse relationships and political decision making, which give a low priority to efficiency, while a high priority to effectiveness. Eifel Tower cultures have bureaucratic division of labor with logical subordination, well-defined hierarchies, functions and roles; they have a rational purpose, ascribed status and specific relationships. Trompenaars and Hampden-Turner noted that Eifel Tower cultures do not adopt to turbulent environments well. Guided missile cultures tend to be egalitarian, impersonal and task oriented. Members in such cultures are equal and each shares problem solving, while loyalties to projects and expertise tend to exceed those to the organization itself. The incubator culture prioritizes fulfilment and self-expression of individuals. They are both personal and egalitarian and operate in environment of intense emotional commitment. Trompenaars and Hampden-Turner noted that incubator cultures enjoy the process of creating and innovating.

The framework proposed by Trompenaars and Hampden-Turner relates to frameworks proposed by Harrison (1972) and further developed by Handy (1993), as well as to the Competing Values Framework of Quinn and Rohrbaugh (1981, 1983) (Fig. 2.1).

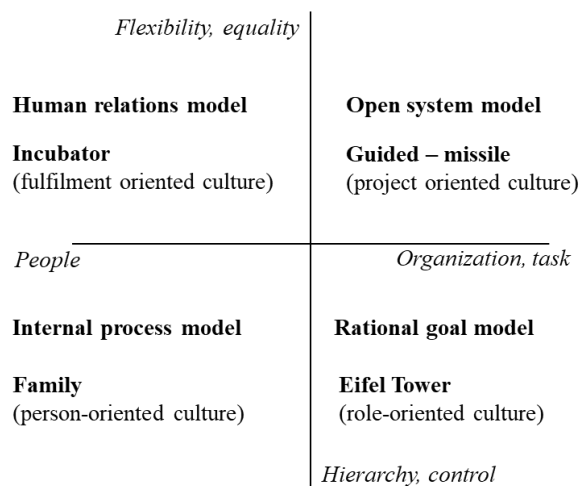


Figure 2.1 - **A summary of the competing values frameworks**  
Source: author’s summary based on the literature review

Another frequently referred framework by Mintzberg (1979, 2007) builds on two axes – power distance and uncertainty avoidance – leading to five organizational configurations – entrepreneurial, machine (the bureaucracy), professional, divisional (diversified), as well as innovative organization (the adhocracy). The entrepreneurial organization has a flat structure and significant influence of top leadership; such an organization is fast, flexible, and lean, however

face a high risk of bad decision making due to power concentrated at the top. The machine organization is formal, standardized and has a centralized control, it can operate efficiently achieving economies of scale in stable environments. The professional organization is bureaucratic as well, however relies on skilled professionals and the decision making is decentralized. Specialization and lack of control can make such organizations hard to change. The divisional organization has centralized structures supporting autonomous sub-structures; it allows members to maintain control and accountability, however, such organizations are not flexible and work the best in stable circumstances. Finally, the innovative organizations or adhocracies have decentralized decision making processes, such organizations are faster and more flexible, at the same time can face conflicting authorities and are hard to control.

Schneider (2017) constructed another four-dimensional model for cultural analysis that addresses aspects of leadership, authority, decision making, structure, relationships, staffing, and performance management. Schneider’s model seeks balance between focus on people vs. focus on organization, similarly to the competing values approach. The other axis defines, where an organization stands between present and future focus. Thus, Schneider proposes four cultural types – process driven control cultures that ensure performance and operational goals, relationship and participation driven collaboration cultures, where performance accomplishes unique customer goals, mission-oriented cultivation cultures, where performance operationalizes value-centered goals, and innovation driven competence cultures, where performance achieves conceptual goals (Fig. 2.2.). Control cultures relate to previously discussed hierarchical cultures, while competence cultures – to adhocracies.

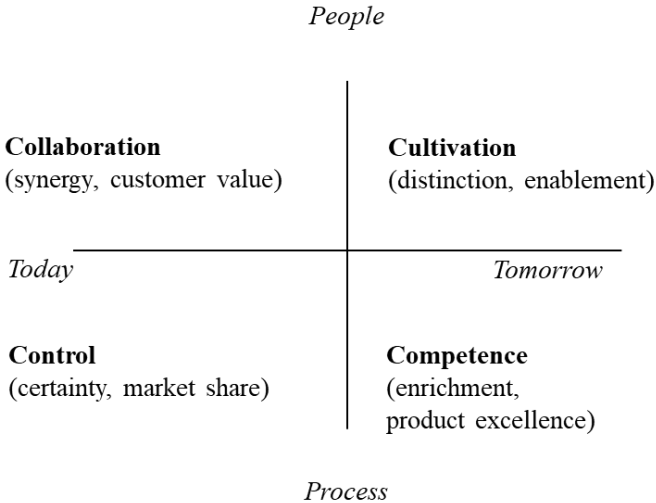


Figure 2.2 – **Cultural Assessment Model**  
Source: adopted from Schneider (2017)

Cooke and Szumal (2000) proposed a framework contrasting people vs. task orientation on one hand and fulfilling higher-order satisfaction needs vs. protecting and maintaining lower-order



security needs on the other. The framework proposes three types of organizational culture - constructive, passive/defensive, and aggressive/defensive. According to the framework, constructive cultures encourage healthy interaction and exchange of ideas amongst the employees to deliver the best results for themselves and the organization. In passive cultures, employees behave in the way to please their superiors and aim to secure their jobs and positions. Finally, aggressive cultures promote competition amongst the employees, and members strive for power, attention and appreciation.

Other frameworks look at the types of power and commitment. For instance, Etzioni (1975) proposed an organizational framework based on two dimensions - type of power and the level of involvement. In this framework, power could be coercive, remunerative - materially rewarding, or normative - ascribed, routinized "charisma" as means of symbolic rewards and deprivations. At the same time, involvement could be alienated, calculative - rational, or moral commitment. Generally, the higher the rank and greater the power in an organization, the more committed an individual would be. Etzioni argued that each involvement context requires a different type of power, and that normative power is sufficient with a moral commitment, while in utilitarian organizations most individuals contribute and follow the essential rules against remuneration. Based on the distribution of the normative power, Etzioni distinguished between efficiency focused, instrumental T-structures, which are utilitarian and concentrate charisma at the top positions, and goal-oriented, normative R-structures that require charisma to certain positions throughout the organization, and where too much power at the top makes the organization dysfunctional with efficiency superior to goal-orientation.

Deal and Kennedy (1982) proposed a framework with two dimensions - the level of risk and the speed of feedback, whether approaches and decisions had been successful. This framework largely assumes external business environment as the main driver for the organizational culture and proposes four types of cultures accordingly. "The tough guy, macho culture," where the risk is high and the feedback - fast and leaders should accept the risk, decide quickly and develop resilience. "The work hard/play hard culture" is characterized by low risk and quick feedback, and success is measured by persistence. "The bet-your-company culture" characterizes an organization operating in a high-risk, yet slow-feedback environment - usually associated with large infrastructure projects. Finally, "process cultures" operate in low-risk and slow-feedback environment. In absence of risk and measurable results, these organizations focus on internal procedures creating bureaucracies and employees become defensive (Deal and Kennedy, 1982, pp. 107-108).

Building on some of the previous models, Scholz (1987) identified typologies of culture around three dimensions - evolution-induced (how cultures change over time), internal-induced

(how internal circumstances affect culture) and external-induced (the impact of the external operating environment). Evolution dimension distinguishes between five types of organization – stable (past-focused, risk-avoiding), reactive (present focused, accepts minimal risk), anticipating (present focused, more willing to accept risk), exploring (present and future focused, willing to accept risk) and creative (forward looking and ready to accept ambiguity). Internal dimension distinguished between production, bureaucratic and professional cultures. Finally, the external dimension directly used the model proposed by Deal and Kennedy (1982).

Goffee and Jones (1998) characterized organizational culture using two dimensions – solidarity – commonality of interests and goals, and sociability – friendliness, identifying four types of organizational culture – fragmented (low on both dimensions), mercenary (high solidarity, low sociability, networked (high sociability, low solidarity) and communal (high on both). Fragmented organizational culture characterizes employee individualism and autonomy and high-risk, fast-pace organizations. Mercenary culture is very result-oriented and can be highly productive. Networked culture focuses on building relationships to accomplish goals and secure positions. Finally, communal cultures are concerned with both – results and the people. Each of the types have different triggers for innovation – it depends on individual abilities in fragmented, external market pressures in mercenary, diversity of talent and connections in networked, and teamwork and participation in communal cultures (Downton, 2005).

Anderson and West (1998) referred to a four-dimensional framework for team climate and innovation, including vision, participative safety, task orientation as well as support for innovation. Anderson and West claimed that groups with clearly defined vision and objectives can focus and develop new goal-appropriate methods. Participative safety relates to active involvement - the more people participate in decision making, the more committed they are to implement these decisions. Task orientation describes striving for improvement and a commitment to excellence. Finally, support for innovation includes the expectation, approval and support for new and improved ways of working.

Finally, Schein (2004) proposed three contradictory sub-cultures that organizations may have for various functional groups - 1) an operator culture that gets the job done, 2) an engineering culture for research and development and 3) an executive culture for organizational survival. In the operator culture, organizational success depends on employee knowledge, skills and commitment - rules and procedures cannot be developed for all situations in advance, and employees should be able to learn and deal with unpredictable situations. Employees collaborate and trust each other, as many organizational tasks are interdependent. In an engineering culture, employees work based on science and technology, enjoy solving puzzles and overcoming problems, and develop simple and useful products and outcomes. Finally, an executive culture is

primarily focused on financial survival and growth. The environment is competitive and can be hostile, leaders exercise a large degree of control, hierarchy is valued, and information is not shared freely. People are perceived as any other resources for particular activities. Gradually such an organization can become depersonalized, managed by rules, processes and rituals. Thus, in terms of the competing values framework, the task is to align the goals of these three subcultures – completing the job, remaining innovative and surviving economically. According to Schein (2004), an organization would not be able to survive, when one of those sub-cultures overshadows the other.

These cultural archetypes tend to center around several axes, which at the same time represent certain aspects of cultural dimensions (Table 2.2).

**Table 2.2 – Dimensions and Cultural Archetypes**

<b>Framework</b>	<b>Cultural Archetypes</b>	<b>Central Axes</b>	<b>Cultural Dimensions</b>
Harrison – Handy	Power, role, task, person orientation	Equality - hierarchy Person – task	Contextual consideration, activity and result orientation, relational orientation Contextual consideration, activity and result orientation, relational orientation
Trompenaars and Hampden-Turner	Family, the Eifel Tower, the guided missile and the incubator	Egalitarian – hierarchical Person - task	
Etzioni	Normative, coercive and utilitarian organizations	Power Involvement	Relational orientation
Mintzberg	Entrepreneurial, machine, professional, divisional and innovative organizations	Power distance Uncertainty avoidance	Contextual consideration, relational orientation
Quinn – Rohrbaugh	Open systems, rational goal, internal process and human relations model	People – organization Flexibility – control	Contextual consideration, activity and result orientation, relational orientation
Denison - Spreitzer	Developmental, rational, hierarchical or group culture.	Process - outcomes	
Deal - Kennedy	Tough guy, macho culture, work hard/play hard culture, bet-your-company culture, process culture	Degree of risk Speed of feedback	Contextual consideration, time orientation, activity and result orientation, relational orientation
Scholz	Evolution-induced, internal-induced, external-induced	Past – future Organizational structure Degree of risk Speed of feedback	Time orientation (evolution), contextual consideration (internal), activity and result orientation, relational orientation (external)
Cooke and Szumal	Constructive, Passive/Defensive, and Aggressive/Defensive cultures	People – task orientation Satisfaction – security	Contextual consideration, activity and result orientation, relational orientation (external)
Schneider	Collaboration, cultivation, competence, control	People – process Today - tomorrow	Relational orientation Time orientation
Goffee - Jones	Fragmented, mercenary, communal, networked	Solidarity Sociability	Relational orientation
Anderson and West	Vision, participative safety, task orientation, support for innovation		Relational orientation, activity and result orientation
Schein	Operator, engineering and executive cultures	People – task orientation Present - future	Contextual consideration, relational orientation, activity and result orientation

Source: author’s summary based on the literature review

Each of the frameworks establishing cultural archetypes contrasts just few dimensions. They oversimplify the differences and overstate the commonalities (Martin, 2002). Yet, similarly to the dimensions of organizational culture, archetypes indicate the leading directions and tendencies, and can provide a meaningful way to compare different cultures. Additionally, organizational approaches change over time, as Tushman (1997, p.15) suggests “*The older an organization becomes, the more it develops myths, stories, histories [...], the more it’s people tend to develop a paradigm of the way the work should be done.*”

Based on the literature analysis, the main dimensions to consider, when evaluating an innovation enhancing organizational culture are:

- ***hierarchy vs. power balance, flexibility vs. control*** (relational orientation) – the theory suggests that extensive hierarchy, use of formal rules and bureaucracy hinders creativity and innovation (Trompenaars and Hampden-Turner, 1997; Moonen, 2017), while participation in the decision making process ensures employee commitment to implementing ideas in practice (Anderson and West, 1998);
- ***individualism vs. collectivism*** (relational orientation) can impact innovation in diverging ways. On one hand, individualistic cultures enhance creativity, freedom of expressing ideas and individual rewards for proposing useful innovative ideas, on the other hand, extreme individualism implies lack of cooperation (Moonen, 2017), thus some form of collectivism – cooperation and trust in the team and the organization - may contribute to innovation;
- ***human vs. task or organizational orientation*** (relational orientation) – the theory indicates that some degree of task-orientation is required for an effective innovation process, at the same time human orientation has a positive impact on innovation increasing individual motivation (Moonen, 2017);
- ***past, present and future orientation*** (time orientation) – Gupta (2011) and Moonen (2017) suggest that future orientation and long-term approach are needed to recognize innovative opportunities. SMEs engaging in strategic planning are more innovative, have more new products, employ new processes and management technologies and achieve international growth (Wang, Walker, and Redmond, 2007);
- ***process vs. outcomes*** (activity and result orientation) – an organization’s orientation towards outcomes and performance has an important role towards facilitating innovation (Anderson and West, 1998, House et al., 2002, Moonen, 2017);
- ***risk and uncertainty tolerance*** (contextual consideration) – previous studies (Shane, 1995; Schein, 2004; Alvarez and Urbano, 2012) indicate that innovative organizations must be able to tolerate some degree of ambiguity. Too risk-averse organizations can miss innovative opportunities (Hughes and Morgan, 2007).

As the literature review suggests, an innovation enhancing organizational culture encourages participation – leaders trust employees and include them in the decision-making process. Such an organizational culture encourages collaboration between employees. At the same time, it is result-oriented and rewards individual contributions. Finally, an innovation enhancing organizational culture is ethical and has a long-term, strategic approach.

## **2.2. Innovation Enhancing Knowledge Management Process and Organizational Learning**

Knowledge, “*a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information*” (Davenport and Prusak, 1998, p. 5), is vital capital for enterprise competitiveness and one of the most significant resources for organizations engaged in innovation activities (Carneiro, 2000; Chen, Zhu, and Xie, 2004; OECD-Eurostat, 2018). Employee knowledge is crucial for organizations to innovate and to develop a competitive advantage (Shanker, Bhanugopan, Van der Heijden, and Farrell, 2017), especially, when the organization can effectively translate individual insights and knowledge into collective knowledge and organizational capability (Lam, 2010). Organizational innovation is based on individual and organizational intelligences (Glynn, 1996). Enterprises that rapidly create and apply knowledge are able to innovate faster and more successfully (Cavusgil, Calantone, and Zhao, 2003), and knowledge management helps to facilitate external cooperation with other organizations and to reduce the complexity in innovation process (Du Plessis, 2007).

### **2.2.1 Knowledge Stocks and Flows within an Organization**

Organizations accumulate knowledge and encompass the collective knowledge in procedures, behavioral routines and shared norms, which guide the problem-solving and interactions among their members (Lam, 2010). Thus, the collective knowledge consists of both – information and expertise, as well as procedures and approaches of managing this information and expertise. Collective knowledge includes stocks of data and flows of knowledge arising from interactions. Knowledge flows can be deliberate and accidental transmissions (OECD-Eurostat, 2018) and can be explained through knowledge management and organizational learning – two multilevel, cyclical and, in the scope of this thesis, largely interrelated concepts.

After collecting and analyzing over 100 definitions of knowledge management, Girard and Girard (2015, p. 14) defined it through cycles of knowledge flows as “*the process of creating, sharing, using and managing the knowledge and information of an organization.*” Meanwhile, organizational learning can be described as a cyclical process, where organizations learn

interacting with their external environments – where individual actions of members lead to organizational interactions, and where environmental responses are interpreted by these members in turn (Sinkula, 1994). Knowledge management enables collaboration, knowledge sharing, continuous learning and development, as well as improves decision making (Du Plessis, 2007), and organizational learning allows to achieve strategic renewal (Crossan, Lane, and White, 1999).

As knowledge flows can be deliberate or accidental, organizational learning can be formal – respectively, learning via structured, linear-sequential forms, non-formal– semi-structured, more focused on exploration and discovery, and informal – unstructured, organized by the learner itself or taking place in an organization without a fixed design (Harkins and Moravec, 2011). Organizational learning depends on practices and routines, patterns of interaction both in the organization and between organizations, as well as on the ability to apply this knowledge. It also depends on structural considerations – smaller organizations with less formalized processes might need to organize learning behaviors around specific organizational practices (Chaston, Badger, Mangles, and Sadler-Smith, 2001).

Knowledge management takes place on three levels - the individual level, team level and organizational level (Du Plessis, 2007). Organizations learn through individuals – while individual learning does not guarantee an organizational learning, it is a prerequisite to it, and the first step towards team learning. *“If teams learn, they become a microcosm for learning throughout the organization”* (Senge, 1990, p. 220) - such a team learning has three critical dimensions – the need to think insightfully about complex issues, the need for an innovative, coordinated action, and the role of team members on other teams towards sharing the learning outcomes more broadly.

The collective knowledge can exceed or be less than the sum of knowledge by organization’s members depending on the ways and mechanisms that translate individual knowledge into collective knowledge (Glynn, 1996). Similarly, organizational learning is not just a sum of employees learning – new information leads to insights, which can further result in improvements and can form organizational processes and behaviors (Matthews, MacCarthy and Braziotis, 2017).

### ***2.2.2 Knowledge Creation at Organizational Level for Innovative Activities***

The knowledge cycle starts with ***knowledge creation or generation***. Information and new ideas may come into an organization from various sources on continuous, yet frequently unsystematic manner (Carneiro, 2000). However, information has little value, before it is understood and turned into knowledge (OECD-Eurostat, 2018). Knowledge generation can be understood as the internal processing of knowledge, when individual employees receive and

interpret information, and share learnings, which thereby become an integral part of organizational knowledge (Griese et al., 2012, p. 469).

Organizations may use internal ideas and learnings. Griese et al. (2012) emphasized the uniqueness of knowledge generation skills and processes due to embeddedness in organization members' cognitive activities. Knowledge generation is closely related to creativity (Baker and Sinkula, 1999) - a non-routine action, requiring a flexible mind, potential originality and effectiveness (Corazza, 2016). Innovation literature frequently lists creativity as a precondition for innovation, as it enhances thinking of new ways of doing things with an added value (Liu et al., 2017), and leverage often comes from new ways of thinking (Senge, 1990).

On the other hand, organizations can gain inputs from external knowledge sources for innovation activities (Chesbrough, 2003; Dahlander and Gann, 2010), for instance from key customers, investors and experts (Enkel, 2010). Organizations may also have access to specific, external knowledge that is valuable and rare, and that other companies do not possess (Day, 1994). Grigoriou and Rothaermel (2017) explained that organizations increasingly rely on a combination of internal and external knowledge sourcing, where the degree on complementarity depends on the absorptive capacity – enterprise ability to recognize the value of new information, assimilate it, and apply in commercialization (Cohen and Levinthal, 1990), intellectual property considerations, research and development, interactions between different levels of analysis, capability differences in value chain segments, as well as different learning stages.

Knowledge can be captured into objects such as databases and publications, on the other hand in can be embodied into routines and know-how (OECD-Eurostat, 2018). Knowledge can also have different types – explicit knowledge can be structured, documented and easily shared in higher volumes, on the other hand tacit or implicit knowledge includes know-how gained through personal experiences. Such knowledge is more difficult to capture in documents or share. According to Nonaka (1994), organizations play a significant role mobilizing tacit knowledge from individuals and enabling knowledge creation spiral through socialization, combination, externalization, and internalization (Fig.2.3).

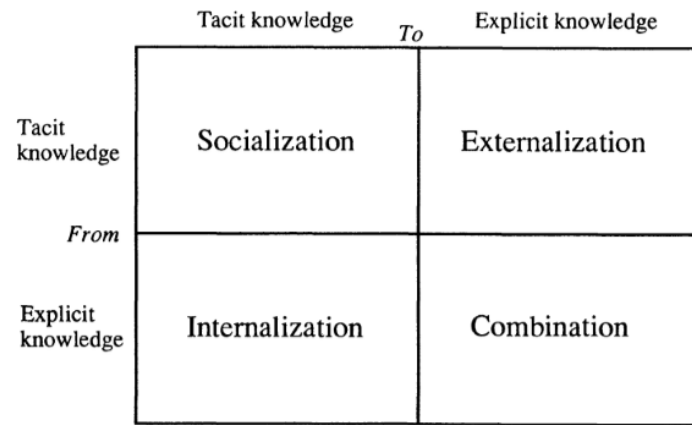


Figure 2.3 – **Modes of the Knowledge Creation**

Source: Nonaka, 1994, p. 19

In his model, Nonaka proposes four modes of transition between tacit and explicit knowledge. Socialization includes exchange of tacit knowledge through daily social interactions. Externalization includes a process, where tacit knowledge is formalized and structured, so it can be shared with others. Combination includes exchange between internal and external explicit knowledge. Finally, internalization turns explicit knowledge into tacit knowledge of individuals.

Knowledge creation includes various processes and activities – such as knowledge recognition, analysis, codification, documentation, assimilation and storage. Knowledge integration – the extent to which distinct and interdependent organizational units simultaneously coordinate knowledge processes, employees and technology, plays an important role in the knowledge creation process (Barki and Pinsonneault, 2005).

Organization provides the key social context for knowledge creation and collective learning (Nonaka and Takeuchi, 1995). Within an organization each member is learning and sharing knowledge, thus learning process occurs at several levels – everyone is learning, and each organization is collectively learning and collecting knowledge, and creating a collective memory and mind of the organization (Walsh and Ungson, 1991). A working group provides an important place for intense learning and knowledge creation, thus new and innovative forms of organization can use a decentralized, group-based structure as a key organizing principle (Lam, 2010).

### **2.2.2 Knowledge Sharing and Institutionalizing**

Knowledge sharing ensures that the learnings are useful to the organization beyond individual employees. Day (1994, p.13) suggested that *“knowledge is not fully captured in a usable form until the lessons and insights are transferred beyond those who gain the experience,”* while Senge (1990, p. 224) discussed that dialogue allows people to observe their own thinking. Chaston et al. (2001) highlighted the need for organizations to harness individual learning for an



organizational gain to improve the competitiveness. Knowledge sharing can take place within one organization, or between organizations, sometimes referred to as knowledge transfer or knowledge exchange.

Similarly, Crossan et al. (1999) concluded that innovative ideas occur to individuals, while organizations as relationship and process systems transform them, and conceptualized knowledge sharing from individual to organizational level in a 4I framework, Fig. 2.4:

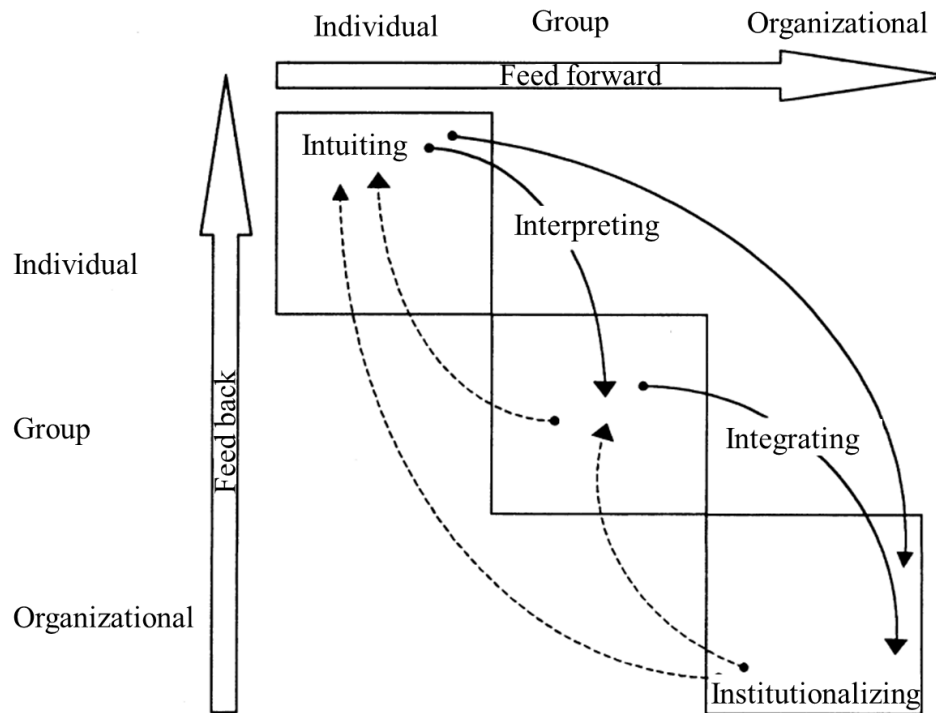


Figure 2.4 – 4I Framework

Source: Crossan et al., 1999, p. 532

The 4I framework explains organizational learning and knowledge sharing through four processes - intuiting, interpreting, integrating, and institutionalizing taking place at individual, group, and organizational levels. According to the framework, individuals intuit using experiences, and interpret, using cognitive maps and conversations. Groups integrate learnings based on shared understandings and by using mutual adjustment. And, finally, organizations institutionalize learnings into routines, rules and procedures. There's also a feedback process, how structural characteristics, organizational level policies, procedures and culture influence knowledge sharing and learning behaviors.

Knowledge sharing improves organizational abilities to generate solutions and efficiencies for competitive advantage (Reid, 2003). Knowledge sharing can also be a critical resource for the competitive advantage (Nonaka and Takeuchi, 1995). Several forms of knowledge sharing exist – for instance, sharing knowledge about internal capabilities, customers and suppliers (Hong, Doll, Nahm, and Li, 2004). The first type of knowledge sharing refers to understanding of organization's

internal management, talents and expertise of human resources, the second type – to understanding the needs and dominant preferences, as well as anticipating the future needs of consumers, and the third type includes understanding of suppliers' structures and processes.

Knowledge sharing can take place through direct contacts between organizational members, especially, when exchanging tacit, non-codified knowledge these members possess (Nonaka, 1994). Alternatively, codified knowledge can be shared through documents and data in electronic databases, such knowledge is later accessible for other employees, when needed. Internal, within an organization, and external, between organizations, knowledge sharing is central to innovation.

### ***2.2.3 The Continuous Knowledge Cycle of an Innovative Organization***

Knowledge using refers to application of the available knowledge in decision making processes and task performance routines - procedures, rules, norms and processes that guide future behavior (Becerra-Fernandez and Sabherwal, 2010), and to leveraging knowledge as an organizational asset enhancing business performance, speed and effectiveness (Du Plessis, 2007). It can also include transforming information in a way that can be used in a decision-making process (Harkins and Moravec, 2011).

Organization's ability to innovate is closely linked to its strategic renewal, its intention and ability to manage change. Thus, knowledge updating concludes and restarts the knowledge cycle for any organization operating in an ambiguous and dynamic environment, meaning that an organization does not deal with a permanent stock of knowledge but rather a constant flow of it. Jaworski and Kohli (1993) suggested that considering the dynamic environment, organizations continuously seek new forms of organizing their learning processes. Crossan and co-authors (1999) emphasized that through learning process organizations could align themselves with the dynamic environment. Similarly, to knowledge creation, knowledge updating can happen in a systemic or unstructured way.

Continuous knowledge acquisition is essential for innovation, as allows converting knowledge into added value. This leads to developing a continuous organizational necessity to improve the learning process and new knowledge (Senge, 1990). Lam (2010) also considered that the main organizational challenge for innovation is not just maintaining the static balance between exploitation and exploration, or stability and change, but continuously coordinating and balancing them throughout the organization.

Often knowledge updating imply getting the newest information and complementing the existing knowledge and practices. Alternatively, knowledge updating might require revising former considerations that are no longer valid an applicable for the new circumstances, yet

organizations may find it difficult to change, unlearn the past practices and find new ways of doing things. This can be illustrated through parallels with the single loop and double loop learning. Argyris and Schön (1992) explored the relation between mental models and organizational processes and concluded that gradual learning against established criteria could result in a better performance over time (defined as a single-loop learning), however more complex situations may require individuals or organizations to critically review existing mental frameworks, engaging in a double-loop learning.

The knowledge and learning cycle of an innovative organization is systemized in Fig. 2.5.

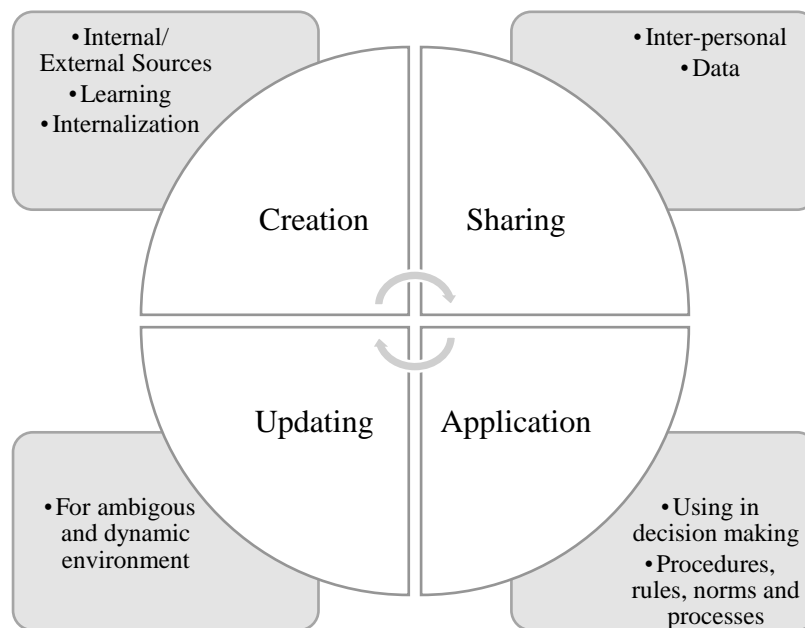


Figure 2.5 – **The knowledge and learning cycle of an innovative organization**

Source: author’s compilation based on Nonaka, 1994; Crossan et al. 1999; Becerra-Fernandez and Sabherwal, 2010; Harkins and Moravec, 2011; Griese et al., 2012; Girard and Girard, 2015; Grigoriou and Rothaermel, 2017.

Considering the previous studies, innovation enhancing knowledge management processes include knowledge creation, knowledge sharing, knowledge application in decision making processes, as well as knowledge assessment and updating. These knowledge management processes could enhance organizational innovation in enterprises.

### **2.3 Organizational Culture and Knowledge Management – Towards a Model Explaining Organizational Innovation**

Depending on the alignment to organizational vision, strategy and external environment, organizational culture can be a resource or an obstacle to innovate. Losane (2013) proposed five aspects of organizational culture relevant to innovation – values, strategy, structure, behavior and communication and leadership. Goran, Srinivasan, and LaBerge (2017) advised organizations

investing in cultural change to adopt to emerging and dynamic external environment, and Groysberg et al. (2018) emphasized the role of organizational culture towards maintaining viability and effectiveness.

Number of studies analyze the impact of organizational culture on innovation at enterprise level. Çakar and Ertürk (2010) found empowerment contributing to SME innovation capability; uncertainty avoidance increasing employee participation, while collectivism and power distance decreasing empowerment. Bortolotti et al. (2015) concluded that a high institutional collectivism, future and humane orientation together with low assertiveness facilitate successful implementation of new business practices. Ali Taha et al. (2016) found that alignment between employee and organizational values, implementation of employee ideas and atmosphere of psychological safety motivates employees to propose new ideas, while open team communication contributes to team creativity. Prange and Pino (2017) found personal and organizational capability drivers, including leadership attitudes towards risk, knowledge, trainings and favorable work environment and culture having a positive impact on organizational innovation in exporting Portuguese SMEs. Shahzad and Shahbaz (2017) concluded that strong, flexible and inclusive organizational culture motivates employees to participate in decision making and increases organizational innovation performance. Zhang and Merchant (2019) suggested that improvisation capability and learning capability contributes to SME innovation capability. Papa et al. (2018) proposed that knowledge acquisition positively contributes to innovation performance, and this link is further positively reinforced by developing a trustful and powerful organizational climate and flexibility, increasing employee commitment and empowering them to innovate and share ideas and visions.

The concepts of organizational culture and knowledge management and organizational learning behaviors are interlinked. Organizational culture influences knowledge creation, shaping assumptions and relationships between individual and organizational knowledge (De Long and Fahey, 2000). Culture can encourage sharing and integration through dialogues (Davenport and Prusak, 1998), facilitate knowledge creation and diffusion (Chatzoudes, Chatzoglou, and Vraimaki, 2015) and foster implementation of knowledge sharing processes that improve organizational performance (Oyemomi et al., 2019).

Members of the organization share information, creating a collective memory – shared beliefs, assumptions and norms (Argyris and Schön, 1978). Additionally, organizational culture can facilitate involvement and participation, thus creating a commitment to learning. Organizational culture also contributes to attitudes towards learning through open-mindedness, shared vision and commitment to learning (Griese et al. 2012).

Collectivistic and individualistic organizations exhibit different organizational learning patterns and approaches. Lam (2010) suggested two forms of innovative organizations according

to their ways of learning - “J-form” and ‘adhocracy.’ “J-form” organizations represent the Japanese model of learning, they excel at exploitative learning, gaining innovative capabilities by developing organization-specific collective competences and problem-solving techniques. Adhocracy organizations, on the other hand, rely on expert knowledge organized in flexible project teams capable to rapidly respond to knowledge and skill changes; such organizations excel at explorative learning.

In terms of information exchange and knowledge management, Boisot (2010) proposed four organizational archetypes - bureaucracies, markets, fiefs and clans – in their essence close to the previously discussed cultural archetypes. According to this framework, bureaucracies exchange explicit and organized information with a controlled diffusion based on a “need-to-know.” The pyramidal structure of high-power distance and high uncertainty avoidance organizations give leaders a strategic information advantage. Markets exchange codified and standardized information that is diffused and broadly available; relationships are competitive and impersonal. Fiefs reflect the charismatic authority and exchange highly personal, uncodified, concrete and undiffused – personal information, and the approach is collectivistic - joined values and mutual trust. Finally, clans include concrete experiences and tacitly held values and exchange uncodified information in small communities.

Garvin (1993) emphasized that a commitment to learning is needed for continuous improvement. Lam (2010, p. 174) suggested that “*innovation is a process of learning, and learning is a collective process that occurs within an organized setting,*” describing innovative organizations as intelligent, creative and capable of learning, creating, absorbing and exploiting knowledge. And Zhang and Merchant (2019) found organizational learning the most significant factor influencing innovation capability of Chinese SMEs.

Stock et al. (2013) analyzed organizational culture through innovation-oriented values - innovativeness and creativity, flexibility, openness, norms - unbureaucratic solutions to difficult situations, constant development of new, value-adding products and services and appreciation of unconventional ideas, as well as through artefacts - stories of exemplary innovation-oriented behavior of leaders, attractive meeting and discussion areas and regular innovation events with stakeholders. Kenny and Reedy (2006) considered that innovation-oriented culture encourages risk-taking, emphasizes participation and shared responsibility. Wang, Begley, Hui, and Lee (2012) suggested that innovation supporting culture includes risk-taking, future orientation, open mindedness, and learning, at the same time the best organizational results can be achieved, when the culture is also outcome oriented.

From the literature analysis, the following aspects of an innovation enhancing organizational culture emerge (Table 2.3).

**Table 2.3 - Indicators of an Innovation Enhancing Organizational Culture**

<b>Dimension</b>	<b>Frameworks</b>	<b>Factors</b>	<b>Impact on innovation</b>
Relational orientation	Kluckhohn and Strodtbeck (1961), Hofstede et al. (2010), Etzioni, (1975), Harrison – Handy (1972-1993), Denison and Spreitzer (1991), Hampden-Turner and Trompenaars (1997), Schneider (2017), Anderson and West (1998), Goffee and Jones (1998), Schein (2004), Mintzberg (1979, 2007), House et al. (2004)	Management trusts employees	Trust enhances behavioural innovativeness; vertical trust is essential to support new ideas and innovations (Ellonen et al., 2008; Papa et al., 2018)
		Employee cooperation	Innovation results from cooperation (Waychal et al., 2011)
		Employee initiative	Initiative supporting organizational climate enhances introduction of innovation (Baer & Frese, 2003; Ali Taha et al., 2016; Papa et al., 2018)
		Participation in decision making	Participation in the decision-making increases employee commitment to implementing ideas (Anderson and West, 1998; Kenny and Reedy, 2006; Çakar and Ertürk, 2010; Shahzad and Shahbaz, 2017)
		Employee professional development	Professional development trainings are positively associated with a higher propensity to undertake innovation and new workforce skills are often required, when introducing innovation (Toner, 2011; Prange and Pino, 2017; Zhang and Merchant, 2019)
Result orientation	House et al. (2004), Hofstede et al. (2010)	Individual performance evaluation	Outcome and performance orientation facilitate innovation (Anderson and West, 1998, House et al., 2002; Moonen, 2017);
Future orientation	Kluckhohn and Strodtbeck, (1961), Scholz (1987), Hampden-Turner and Trompenaars (1997), House et al. (2004)	Long-term, strategic planning	Future orientation and long-term approach are needed to recognize innovative opportunities (Gupta, 2011; Wang et al., 2012; Bortolotti et al., 2015; Moonen, 2017)
Sustainability orientation	Schein (2004)	Business ethics	More ethical work culture and organizational behaviour could enhance organizational innovation performance (Apsalone and Flores, 2018)

Source: author’s summary based on the literature review.

Relational orientation includes such indicators of organizational culture as trust and cooperation, which are essential characteristics of an innovation supportive work climate in an organization. Employee participation in decision making ensures employee commitment to implementing new ideas and their overall engagement with the organization. Employee initiative helps to capture new opportunities and thus an organizational culture supporting initiative enhances introduction of innovation. And professional development of employees contributes to innovation by ensuring greater commitment and engagement, as well as providing the necessary skills for introducing innovation.

Result and performance orientation facilitate innovation, as broadly confirmed by the literature. Individual performance evaluation is an essential aspect of a result and performance driven organization.

Long term, strategic approach is needed to recognize innovative opportunities. Long-term strategic planning ensures that organizations consider their vision in practical terms. Finally, sustainability and business ethics contribute to organizational longevity, and more ethical work culture and organizational behavior could foster innovation.

Table 2.4 explains the contribution of the knowledge management cycle to introduction of innovation.

**Table 2.4 – Indicators of Innovation Enhancing Knowledge Management**

<b>Knowledge cycle</b>	<b>Processes</b>	<b>Implications to innovation</b>
Knowledge creation	Creative discussions, knowledge generation, internalization of external knowledge	Creativity contributes to innovation through thinking of new ways of adding value (Senge, 1990; Liu et al., 2017; Papa et al. 2018)
Knowledge sharing	Employees sharing their knowledge with colleagues	Harnessing individual learnings for organizational gain improves competitiveness (Chaston et al., 2001). Knowledge sharing helps organizations to gain competitive advantage (Nonaka and Takeuchi, 1995; Reid, 2003).
Knowledge application	Knowledge application in decision making processes and task performance routines	Knowledge is amongst the most important resources for organizations to innovative (Shanker et al., 2017; OECD-Eurostat, 2018)
Knowledge updating	Strategic assessment of the available knowledge and identifying new learning needs	Knowledge updating is essential for innovation, as allows organizations to align with the dynamic environment (Jaworski and Kohli, 1993; Crossan et al. 1999)

Source: author’s summary based on the literature review.

Knowledge creation that takes place through internal creative discussions and knowledge generation, as well as internalizing knowledge obtained from external sources, adds to innovation through new ways of thinking, as well as new knowledge that can contribute to innovation activities. Knowledge sharing ensures that individual learnings and knowledge are beneficial beyond the individual employee, thus helps to disseminate any new knowledge, improves competitiveness and helps organizations to gain a competitive advantage. Knowledge application refers to using knowledge in organizational decision-making processes. Considering that knowledge is an important resource for innovation, it is essential that organizations take advantage of this resource. Finally, knowledge updating includes a strategic assessment of the available knowledge and identifying new learning needs. It is essential for innovation, as helps organizations to align with dynamic and rapidly changing environment.

### *The Conceptual Model*

Considering the analysis of innovation, organizational culture and knowledge management literature, the author proposes the conceptual model explaining the relation between organizational culture, knowledge management processes and organizational innovation (Fig. 2.2).

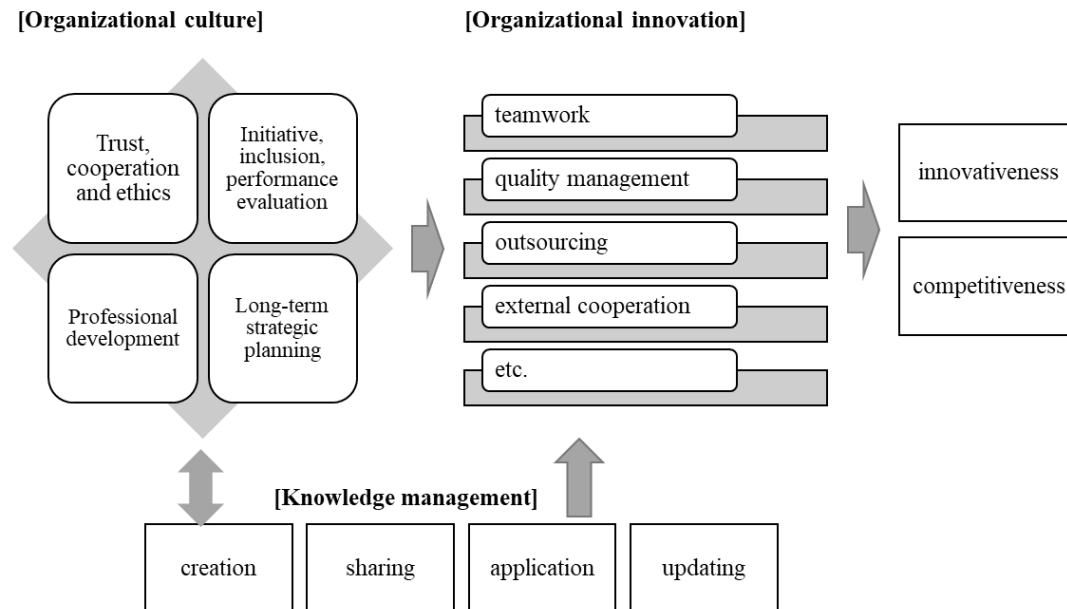


Figure 2.2 – **The Conceptual Model**

Source: developed by the author based on the literature review and analytical content analysis

As the innovation literature considers organizational innovation being beneficial for innovativeness and competitiveness, the model also suggests that organizational innovation serves as an innovation enabler for other forms of innovation and contributes to organizational competitiveness.

The next step includes assessing the conceptual model empirically in Latvian SMEs.



### 3. INNOVATION ENHANCING ORGANIZATIONAL CULTURE AND KNOWLEDGE MANAGEMENT PROCESSES IN LATVIAN SMES

The previous parts underlined the contribution of organizational culture and knowledge management processes to introduction of organizational innovation, as well as proposed a conceptual model explaining these relationships. The third part investigates it empirically in Latvian SMEs to ensure a better understanding of the topic and to gain an empirical evidence to fully answer the research questions and to test the research hypothesis.

#### **3.1. The Conceptual Model and the Research Methodology**

This section introduces the research and methods and explains how the indicators are operationalized. It also explains the target groups and instruments of data collection.

##### *3.1.2. Description of Variables and Questionnaire Development*

###### *Independent variables*

Considering former studies, some of the items reflecting dimensions of organizational culture were self-operationalized, while others measuring cooperation, initiative and professional development adopted from the Team Climate Inventory by Anderson and West (1998), Chandler et al. (2000), Zortea-Johnston, Darroch, and Matear (2011) and Griese et al. 2012 (Table 3.1).

*Knowledge management* - the items for measuring the knowledge management were derived from the literature. Three indicators of knowledge were operationalized from Anderson and West (1998), Zortea-Johnston et al. (2011) and Griese et al. (2012), one was self-operationalized (Table 3.2).

All independent variables listed in Tables 3.1 and 3.2 were measured in a 10-point scale, ranging from 1 (strongly disagree) to 10 (strongly agree). Meanings were provided just for the endpoints of the scale. Considering this, variables measuring organizational culture and knowledge management processes are recorded using an interval scale and considered continuous for further statistical analysis.

**Table 3.1 – Indicators of Organizational Culture**

<b>OC Dimension</b>	<b>Questionnaire item</b>	<b>Abbreviation</b>	<b>Adopted or self-operationalized</b>
Relational orientation	The management trusts employees in your enterprise	Trust	Self-operationalized
Relational orientation	Employees cooperate with each other	Cooperation	Adopted from Anderson & West (1998) “foster an atmosphere of non-threatening co-operation amongst members of team.”
Individual learning	Employees participate in professional development trainings at least once per two years	Professional development	Adopted from Griese et al. (2012) “employees participate at communication trainings,” “employees participate at conflict management trainings.”
Result orientation	Employees take initiative and look for new opportunities	Initiative	Adopted from Anderson & West (1998) “people in this team are always searching for fresh, new ways of looking at problems” Chandler et al. (2000) “if I tried new ways of doing things” And Zortea-Johnston et al. (2011) “we are constantly seeking new opportunities to exploit”
Result orientation	Management involves employees in decision making processes	Inclusive decision making	Adopted from Chandler et al. (2000) “Our supervisors encourage participation in decision making”
Result orientation	Employee contribution is evaluated against the enterprise's goals	Performance evaluation	Adopted from Chandler et al. (2000) “My achievement of predetermined goals”
Sustainability orientation	Employees follow the principles of business ethics in their work	Ethics	Self-operationalized
Future orientation	The enterprise is engaged in long-term strategic planning	Strategic planning	Self-operationalized

Source: author’s summary

**Table 3.2 – Indicators of Knowledge Management**

<b>KM cycle</b>	<b>Questionnaire item</b>	<b>Adopted or self-operationalized</b>
Knowledge creation	Creative discussions take place in the enterprise	Adopted from Griese et al. (2012) “We initiate creative dialogues”
Knowledge sharing	Employees are open to sharing their knowledge with colleagues	Adopted from Anderson & West (1998) “We share information generally in the team rather than keeping it to ourselves” and Griese et al. (2012): “We formally organize the exchange of knowledge, insights, and know-how,” “We initiate the exchange of ideas”
Knowledge application	Employees make an important contribution to decision making processes	Self-operationalized
Knowledge assessment	Management strategically assesses the knowledge available to the enterprise and identifies needs for new training	Adopted from Zortea-Johnston et al. (2011) and Griese et al. (2012): “We systematically identify the need of knowledge relevant to save our competitive position”

Source: author’s summary

### ***Dependent variables: introduction of organizational innovation***

In line with the organizational innovation measurement considerations discussed in the first chapter, variables measuring introduction of organizational innovation were adopted from two conceptual frameworks developed by the OECD-Eurostat (2005) and Armbruster et al. (2008), as well as the study of Camisón and Villar-López (2014). Additionally, an item measuring cross-functional teams was adopted from Zortea-Johnston et al. (2011) (Table 3.3).

**Table 3.3 – Items Measuring Organizational Innovation**

<b>Area of OI</b>	<b>Questionnaire item</b>	<b>Adopted or self-operationalized</b>
Structural OI in workplace organization	Your enterprise has project teams or working groups that include specialists from different fields	Adopted from Armbruster et al., 2008 “Cross-functional teams” and Zortea-Johnston et al. (2011) “We create and sustain cross-functional groups of energetic and opinionated people,” Camisón and Villar-López (2014) “Use of inter-functional working groups”
Procedural OI in business practices	Systems for improving the quality of goods or services	Adopted from OECD-Eurostat (2005) “Organizational innovations in business practices involve [...] quality-management systems” and Armbruster et al., 2008 “Quality Circles,” Camisón and Villar-López (2014) “Use of quality management systems”
Structural OI in external relations	Outsourcing of auxiliary functions	Adopted from Armbruster et al., 2008 “Outsourcing,” Camisón and Villar-López (2014) “Outsourcing of business activities”
Structural OI in external relations	External cooperation (for example, with business associations or business support agencies)	Adopted from Armbruster et al., 2008 “Cooperation/networks/alliances” and OECD-Eurostat (2005) “New organizational methods in a firm’s external relations involve [...] establishment of new types of collaborations”

Source: author’s summary

These forms of organizational innovation were selected as applicable for SMEs from different industries. Considering that not all managers of micro, small and medium-sized enterprises may be familiar with the concept of organizational innovation, the questionnaire referred to the items as work organization methods and provided a brief explanation of each item.

Organizational innovation can be measured as a change process or a result of adoption (Armbruster et al., 2008). The questionnaire design measures innovations as a result of adoption, allowing to distinguish between companies that have introduced and that have not introduced certain innovations. The questionnaire also allows to measure the extent to which an innovation has been implemented (from not used till implemented in the whole organization). Additionally,

the author considered the different lifecycle of organizational innovations and following a recommendation of Armbruster et al. (2008)<sup>2</sup> did not include any specific period, during which an innovation had to be implemented, thus avoiding incorrectly classifying early adopters as noninnovative.

Following questions concerning organizational innovation, two follow-up questions were added – to what extent the implemented innovation helped to increase competitiveness and whether it improved the enterprise's ability to implement other types of innovation. These questions were created based on theoretical considerations discussed in the first chapter and asked only in case there was any form of organizational innovation implemented.

The dependent variables describing introduction of organizational innovation were measured in a 10-point scale, ranging from 1 (not used) to 10 (fully implemented throughout the enterprise). The follow-up items measuring contribution to competitiveness and innovativeness were measured in a 10-point scale, ranging from 1 (strongly disagree) to 10 (strongly agree). In both cases, meanings were provided just for the endpoints of the scale. Variables measuring dependent and follow-up factors recorded using an interval scale and considered quantitative for further statistical analysis.

The relationship between innovation and cultural attributes has been broadly studied using quantitative surveys (Souitaris, 2002; Griese et al., 2012). In line with the proposed research objectives, a structured, close ended questionnaire was developed to assess, how organizational culture and knowledge management processes affect organizational innovation in small and medium-sized enterprises. The proposed questionnaire items were reviewed by academics and managers familiar with the research subject, and some items were reformulated considering their feedback.

Finally, information concerning the profile of the enterprise was collected - how long and in which industry it operated, where it was located, how many employees it had, what was the annual turnover and whether it had foreign ownership (foreign capital in the equity capital). The full questionnaire is provided in Annex 1, and the original questionnaire in Latvian in Annex 2. The questionnaire was also available to respondents in Russian upon their request.

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<sup>2</sup> Armbruster et al. (2008, p. 655) argued that implementation in last three years may be applicable to product innovations, indicating the novelty of the product, at the same time are not applicable to introduction of organizational innovations, as they do not age as product innovations do. Thus, applying the three-year inclusion criteria, studies incorrectly classify only latecomers as innovative and early adopters as noninnovative.

### ***3.1.3. Sample and Data Collection***

The questionnaire was disseminated amongst economically active SMEs in Latvia<sup>3</sup>. The stratified random sample was selected to match the general population of Latvian SMEs in terms of the number of employees, industries and geographical location. Enterprises had to be at least one year old to avoid respondents that are not fully established structurally and just starting their business, as well as to adequately report the innovation processes. And enterprises had to be represented by senior managers to ensure that they have adequate knowledge and oversight of organizational and innovation processes.

The fieldwork was conducted by a research agency Kantar TNS in May and June of 2017 using computer-assisted telephone interviewing (CATI) method in cooperation with the University of Latvia Foundation and support from the patron Eigis Dāvis Timermanis. Kantar TNS contacted 2802 enterprises, resulting in 636 completed interviews with senior managers, a response rate of 23%. Of those 604 were suitable for further analysis. The fieldwork report by Kantar TNS is included in Annex 3. The sample is representative for the general population of economically active SMEs in Latvia. According to the Central Statistical Bureau of Latvia, there were 175481 economically active SMEs, including 164708 micro enterprises, 9162 small enterprises and 1611 medium-sized enterprises in Latvia in 2017. Part of these enterprises were less than one year old by May 2017, thus not in scope. Considering the general population size of 175481, 5% margin of error, 95% confidence level and 50% response distribution, the recommended sample size would be at least 384. The final sample size was 604.

## **3.2 The Main Results of the Survey**

### ***3.2.1 Sample and respondent characteristics***

Considering the **number of employees**, majority (50.3%) of the surveyed companies were micro enterprises and had less than ten employees, 37.1% were small enterprises and employed ten to forty-nine people, 12.6% were medium-sized enterprises and employed fifty to two hundred forty-nine people.

In terms of **turnover**, 24.7% of the surveyed enterprises had the annual turnover till fifty thousand EUR, 14.7% had the annual turnover above fifty thousand EUR, but less than hundred thousand EUR, 23.7% had the annual turnover above hundred thousand EUR, but less than five hundred thousand EUR and 12.3% - above five hundred thousand EUR, but less than one million EUR. 24.67% of surveyed companies had annual turnover of more than one million EUR. The

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<sup>3</sup> As per the European Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises - 2003/361, the doctoral thesis considers SMEs as enterprises, which employ fewer than 250 persons.

annual turnover was positively related to the size per number employees (Fig. 3.1). This association was statistically significant according to Chi-Square test (Annex 4).

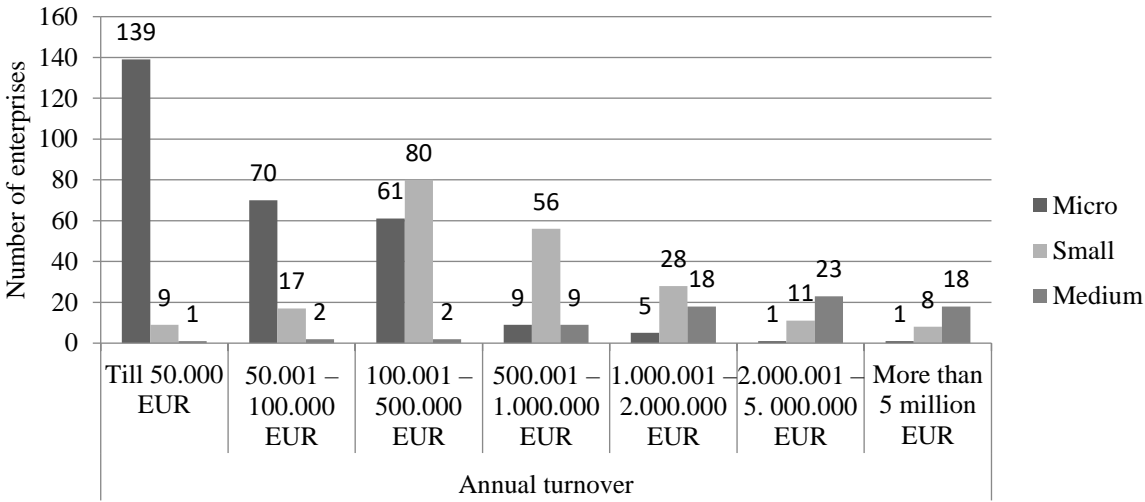


Figure 3.1 – the number of SMEs per annual turnover and size (n = 604)

Source: author’s calculations based on the survey data

Considering **years of operation in industry**, the survey results indicate that enterprises were well-established in their industries. As per the study design, no enterprises newer than one year were surveyed. From the enterprises surveyed, just 2.2% were new and had been working from one to three years, 23.8% - from four to nine years, 43% from ten to twenty years and 31% for more than more than twenty years in their respective industries.

Enterprises had a broad **geographical coverage**. 28.6% of companies were based in the capital city Riga, 23.2 % – in large cities, 23.3% in other cities and 24.8% in rural areas. The sample included companies from all regions of Latvia – in addition to those from the capital, 17.9% were from Greater Riga and from 12.4% to 14.2% form each of four regions.

The sample covered all **industries**, with 5.8% of the enterprises working in agriculture, 14.2% - in manufacturing<sup>4</sup>, 10.4% in construction, 22% in trade, 44.9% in services<sup>5</sup> and 9.9% in education, health and social work (some enterprises operated in more than one industry and were included in all, where they operated, Fig. 3.2). Micro and small enterprises dominated in agricultural sector, education and health care, while in manufacturing the distribution was more even, with most of enterprises small.

<sup>4</sup> NACE B (extractive manufacturing - mining and quarrying) and NACE C - manufacturing

<sup>5</sup> NACE H (transporting and storage), I (accommodation and food service), J (information and communication), K (financial and insurance), L (real estate), M (professional, scientific and technical activities), N (administrative and support service activities), R (arts, entertainment and recreation), S (other services)

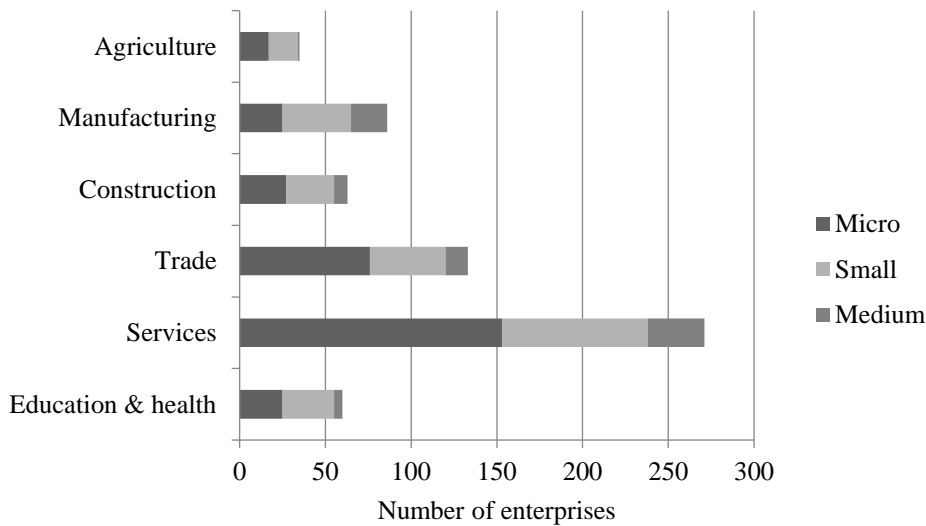


Figure 3.2 – **the number of SMEs per industry and size** (n = 604)  
 Source: author’s calculations based on the survey data

Majority of companies (94.5%) did not have any **foreign investment** in their equity capital, 4.6% had foreign investment at least 50% of their equity capital, and 0.7% had received some foreign investment, but less than 50% of their equity capital. Considering the very small number of companies in the last category, only the comparison between having more than 50% of foreign capital versus having no foreign capital was considered. 25% of enterprises with over 50% of foreign investment in their equity capital, were microenterprises, 32% were small enterprises and 43% were medium-sized enterprises.

### 3.2.2 Indicators of Organizational Culture in Latvian SMEs

Fig. 3.3 summarizes the mean ratings of items measuring indicators of organizational culture in Latvian SMEs, where one indicates the lowest level and ten - the highest level.

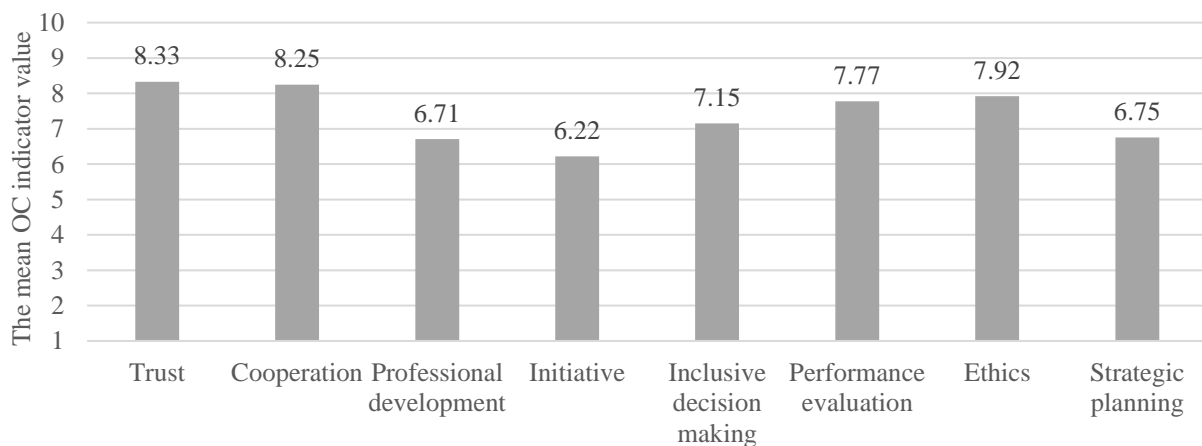


Figure 3.3 – **The mean rating of organizational culture indicators in Latvian SMEs**  
 (in scale from 1 to 10)  
 Source: author’s calculations based on the survey data

**Trust, cooperation and business ethics** were the most highly ranked aspects of organizational culture (Fig. 3.4).

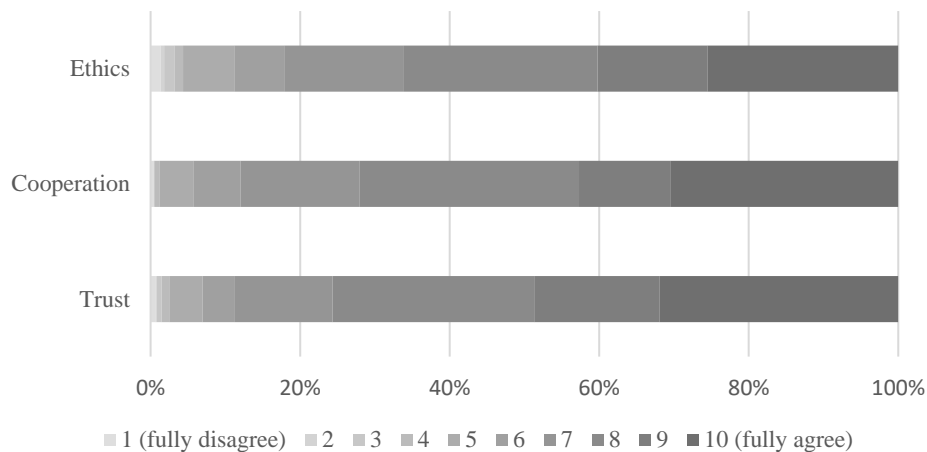


Figure 3.4 – **Ratings of trust, cooperation and business ethics in Latvian SMEs (%)**  
Source: author’s calculations based on the survey data

A significant majority of senior managers in Latvian SMEs agreed that the management trusts employees in the enterprise, the mean rating of 8.33. Nearly half (48.7%) of senior managers rated this statement above eight, while less than 1% below three. Similarly, employees cooperated with each other, the mean rating 8.25. 42.2% of senior managers rated this statement above eight, while just 0.5% below three. Due to the high level of agreement with these statements, both variables have a negatively skewed distribution (Annex 5).

Analysis of variance indicates that senior managers rated trust and cooperation statistically significantly higher in micro-enterprises and enterprises located in Riga, while slightly lower in agricultural and manufacturing enterprises compared to those operating in service industries (Annex 6).

Senior managers also agreed that employees follow the principles of business ethics in their work, the mean rating 7.92. 39.9% of senior managers rated this statement above eight, while just 1.8% rated it below three. Senior managers rated this indicator statistically significantly higher in enterprises with foreign ownership, micro-enterprises, enterprises located in Riga, as well as those operating in service sector.

**Professional development** – displays a different dynamic, the mean rating 6.71. While 37.7% of senior managers rated the statement of employees participating in professional development trainings at least once per two years above eight, 14.4% of senior managers rated it below three (Fig. 3.5).



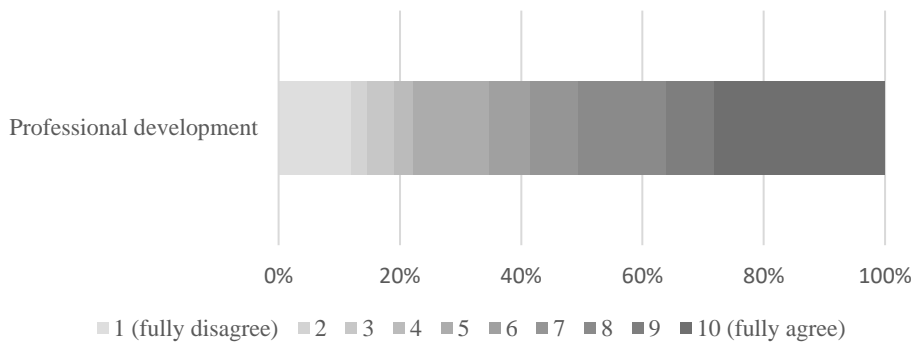


Figure 3.5 – **Ratings of professional development in Latvian SMEs (%)**  
 Source: author’s calculations based on the survey data

Employee participation in professional development was higher in medium and lower in micro enterprises, higher in enterprises from Riga, higher in enterprises working in education, health and social work, while lower in manufacturing enterprises<sup>6</sup>.

*Initiative, inclusion in decision making and performance evaluation* – were on average lower rated indicators amongst items measuring organizational culture (Fig. 3.6). Initiative had the mean rating of 6.22. 17.9% of senior managers rated the statement that employees take initiative and look for new opportunities in their enterprises above eight, while 8.8% of senior managers rated it below three. Senior managers rated initiative lower in manufacturing enterprises, while higher in education, health and social work sector.

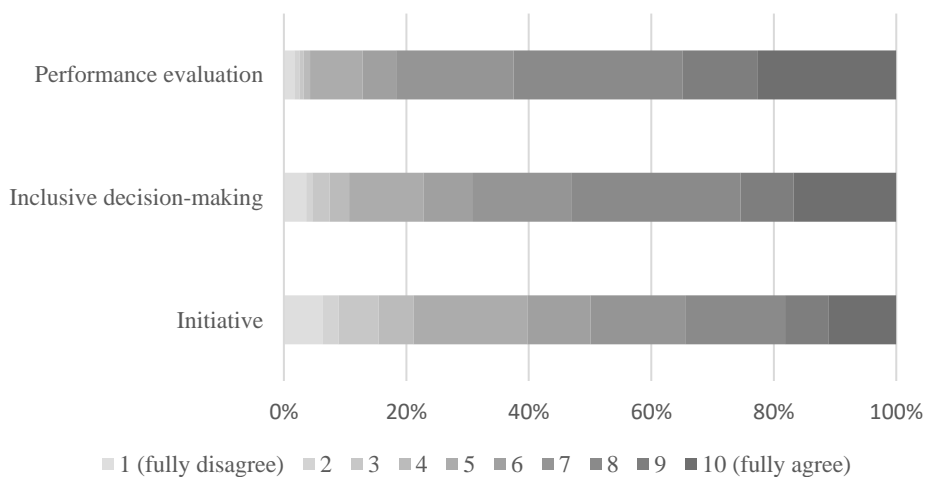


Figure 3.6 – **Ratings of initiative, inclusion in decision making and performance evaluation in Latvian SMEs (%)**

Source: author’s calculations based on the survey data

Inclusive decision making had the mean rating of 7.15. 25.3% of senior managers rated the statement that management involves employees in decision making processes above eight, while

<sup>6</sup> This could be partly explained with professional certification requirements in certain professions.

4.6% below three. Micro and medium-sized enterprises were on average better in including their employees in decision making processes compared to small enterprises. Additionally, enterprises in agricultural sector rated inclusion the lowest and those operating in education, health and social work – the highest.

Performance evaluation had the mean rating of 7.77. 48% of senior managers rated the statement that employee contribution is evaluated against the enterprise's goals above eight, while 2.5% rated it below three. These ratings were not significantly different depending on size or industry. Managers from enterprises operating in education and health and social work rated performance evaluation higher.

**Long-term strategic planning** – finally, senior managers on average more agreed than disagreed that the enterprise is engaged in long-term strategic planning – mean rating 6.75. 24.8% of senior managers rates this statement above eight, while 8.3% - below three (Fig. 3.7) The more employees an enterprise had, the more it was engaged in long-term strategic planning. Additionally, managers from enterprises with foreign ownership and those operating in agriculture, education, as well as health and social work sectors rated this item the highest.

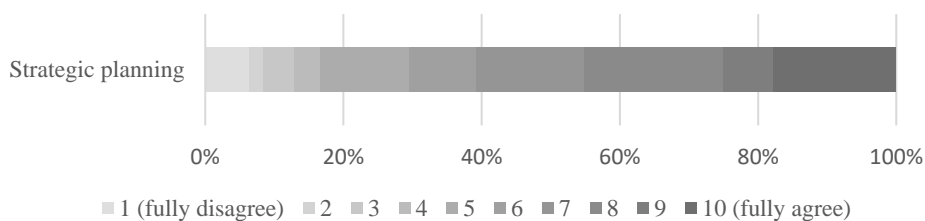


Figure 3.7 – **Ratings of long-term strategic planning in Latvian SMEs**  
Source: author’s calculations based on the survey data (%)

### 3.2.3 Knowledge Management Processes in Latvian SMEs

Assessing knowledge management process indicators, senior managers found knowledge sharing on average the most common, while creative discussions – on average the least common in Latvian SMEs (Fig. 3.8).

**Knowledge creation** - creative discussions - had the mean rating of 6.72. 21.5% of senior managers rated the statement of creative discussions taking place in the enterprise above eight, while 8.3% below three. Enterprises operating in education and arts rated creative discussions the highest, while manufacturing enterprises - the lowest.

**Knowledge sharing** had a higher mean rating of 7.81. 38.4% of senior managers rated the statement that employees are open to share their knowledge with colleagues above eight, while 1.8% below three. Managers from micro and small enterprises rated knowledge sharing higher

than managers from medium-sized enterprises, and managers from service enterprises, particularly from education, health and social work rated knowledge sharing higher than those from agricultural and manufacturing sectors.

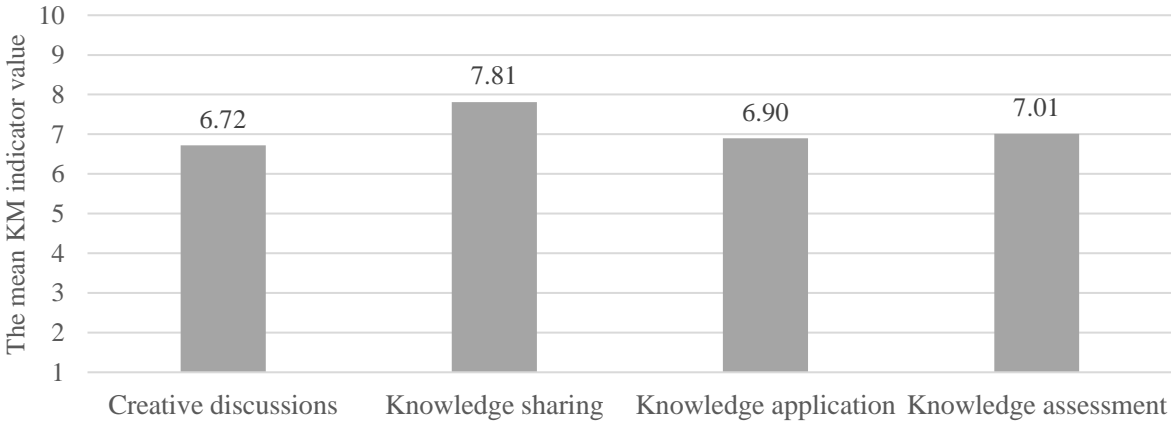


Figure 3.8 – **The mean ratings of KM processes in Latvian SMEs** (in scale from 1 to 10)  
 Source: author’s calculations based on the survey data

**Knowledge application** - contribution to the decision making - had the mean rating 6.90 - 20.1% of senior managers rated the statement that employees make an important contribution to decision making processes above eight, while 4.5% below three. Micro enterprises were better at using the knowledge of their employees in decision making process.

**Knowledge assessment** had the mean rating 7.01. 24.7% of senior managers rated the statement that the management strategically assesses the knowledge available to the enterprise and identifies new training needs above eight, while 5.6% below three. Managers from enterprises with the annual turnover above five million EUR, as well as from enterprises operating in education, health and social work rated knowledge assessment and updating the highest (Fig. 3.9).

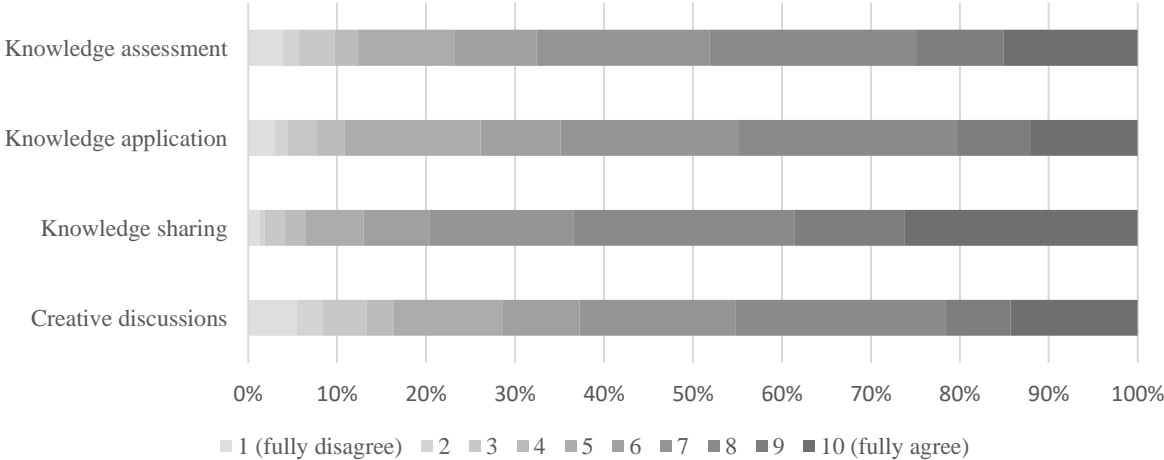


Figure 3.9 – **Ratings of knowledge management processes in Latvian SMEs (%)**  
 Source: author’s calculations based on the survey data

### 3.2.4 Relations and Clustering of Variables Measuring Organizational Culture and Knowledge Management Processes

The doctoral thesis found variables measuring organizational culture and knowledge management processes related to each other. Assuming quantitative variables (see the justification in the section describing variables), the relation was further assessed using Pearson correlation. Table 3.4 displays a positive and a statistically significant correlation at the 0.01 level amongst all variables, except for the correlation between trust and strategic planning, which is statistically significant at the 0.05 level (Table 3.4).

The study found the most significant correlation amongst the following variables:

- Trust, cooperation and ethics (trust – cooperation 0.567, trust – ethics 0.541, cooperation – ethics 0.545);
- Creative discussions and knowledge sharing (0.540);
- Inclusion in decision making and contribution to decision making (0.626), as well as slightly lower correlation with initiative (inclusion in decision making – initiative 0.574, contribution to decision making – initiative 0.567);
- Professional development and knowledge updating (0.494).

Table 3.4 – Pearson correlation between the independent variables

	Cooperation	Prof. dev.	Initiative	Inclusion in decision making	Performance evaluation	Ethics	Strategic planning	Creative discussions	Knowledge sharing	Knowledge application	Knowledge assessment and updating
Trust	.567**	.215**	.298**	.320**	.287**	.541**	.101*	.218**	.335**	.289**	.165**
Cooperation		.263**	.416**	.316**	.328**	.545**	.132**	.326**	.476**	.387**	.253**
Prof. dev.			.484**	.376**	.406**	.403**	.360**	.373**	.374**	.419**	.494**
Initiative				.574**	.390**	.431**	.302**	.424**	.407**	.567**	.360**
Inclusion in decision making					.451**	.351**	.219**	.399**	.372**	.626**	.364**
Performance evaluation						.411**	.246**	.286**	.340**	.381**	.368**
Ethics							.232**	.335**	.483**	.454**	.390**
Strategic planning								.388**	.249**	.283**	.420**
Creative discussions									.540**	.544**	.400**
Knowledge sharing										.569**	.402**
Knowledge application											.485**

\*\* Correlation is significant at the 0.01 level (2-tailed)

\*Correlation is significant at the 0.05 level (2-tailed)

Source: author's calculation in SPSS based on the survey data

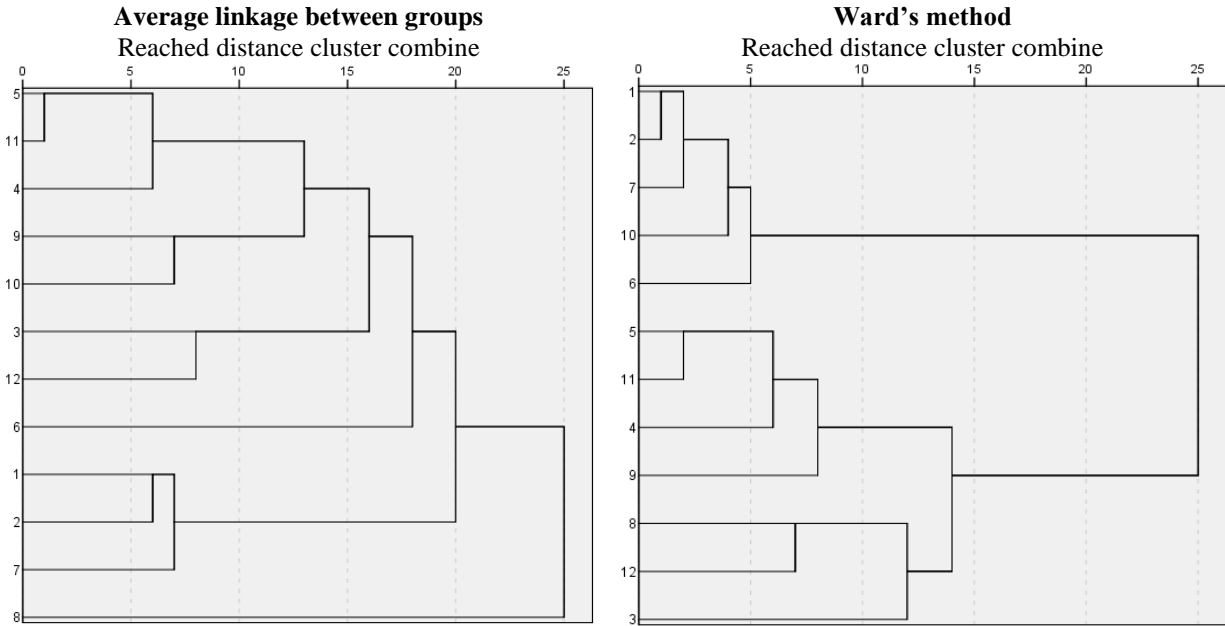
Considering that some variables were so closely linked, the author performed agglomerative hierarchical clustering for the independent variables<sup>7</sup>. Agglomerative hierarchical clustering separates each variable into its own individual cluster in the first step, and subsequently merges similar clusters together. The squared Euclidean distance was used as the most common distance measure for continuous variables (Yim and Ramdeen, 2015).

Squared Euclidean distance can be calculated using formula:

$$\sum_{j=1}^k (a_j - b_j)^2 \tag{1}$$

where a and b – two variables for j case  
 k - the total number of cases included in the analysis.

This algorithm allows to calculate the distance between two variables across all cases and to reflect it in a single distance value. As all independent variables were measured in the same scale, no standardization was used in the analysis. The clustering was performed using between-groups linkage and Ward’s method. Results of the agglomerative hierarchical clustering using between-groups linkage and Ward linkage are displayed in Fig. 3.10.



**Indicators on vertical axes:** 1- trust, 2 – cooperation, 3- professional development, 4 – initiative, 5 – inclusion in decision making, 6 – performance evaluation, 7 – ethics, 8 – long-term strategic planning, 9 – knowledge creation, 10 – knowledge sharing, 11 – knowledge using, 12 – knowledge assessment and updating

**Figure 3.10 - Dendrogram of clustering independent variables using the average linkage between groups (left) and Ward’s method (right).**

Source: author’s calculations based on the survey data

<sup>7</sup> Alternatively, a factor reduction technique, such as principal component analysis (PCA) could be used to transform the valuables into new variables. However, considering the relatively low number of variables and the significant correlation between all of them, PCA with neither orthogonal or oblique rotation provided meaningful results or latent variables for further analysis.

The number of clusters were determined using the agglomeration schedule (Tables 3.5, 3.6).

**Table 3.5 – Agglomeration Schedule for the Cluster Analysis using the average linkage (between groups)**

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	5	11	398.442	0	0	3
2	1	2	482.128	0	0	5
3	4	5	482.509	0	1	7
4	9	10	501.044	0	0	7
5	1	7	511.957	2	0	10
6	3	12	524.181	0	0	8
7	4	9	604.084	3	4	8
8	3	4	646.008	6	7	9
9	3	6	687.614	8	0	10
10	1	3	725.945	5	9	11
11	1	8	810.528	10	0	0

Source: author's calculation in SPSS based on the survey data

**Table 3.6 – Agglomeration Schedule for the Cluster Analysis using Ward linkage**

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	1	2	638.500	0	0	2
2	1	7	1522.000	1	0	4
3	5	11	2440.000	0	0	6
4	1	10	3765.750	2	0	5
5	1	6	5236.800	4	0	11
6	4	5	6901.467	0	3	8
7	8	12	8700.967	0	0	9
8	4	9	10635.300	6	0	10
9	3	8	13299.800	0	7	10
10	3	4	16274.229	9	8	11
11	1	3	21393.417	5	10	0

Source: author's calculation in SPSS based on the survey data

Tables 3.5 and 3.6 show a significant coefficient increase in the first and sixth stage. Since due to several large correlations the analysis aimed at combining more than two indicators, six cluster solution was used for further analysis. Both methodologies cluster trust, cooperation and ethics together, initiative, inclusion in decision making, contribution to decision making together and strategic planning separately in a six-cluster solution. The average linkage groups learning with knowledge assessment and updating, while Ward's method – clusters these variables separately. The average linkage method clusters performance evaluation separately, Ward's method – with trust, cooperation and ethics. Finally, the average linkage clusters creative discussions and knowledge sharing, while Ward's method - knowledge sharing with trust, cooperation and ethics, while creative discussions – separately.

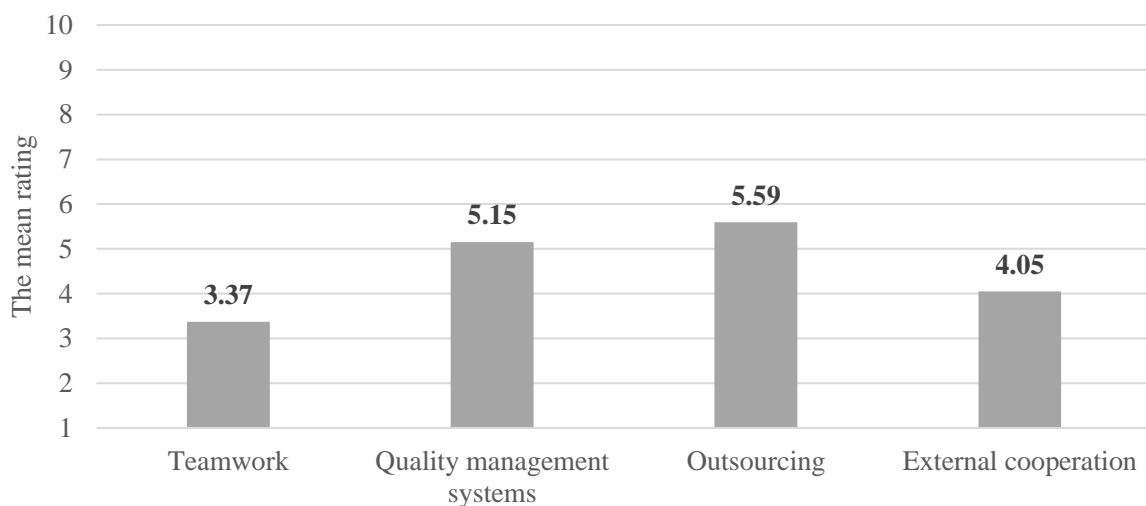
Considering the theory and the correlation between variables, the average linkage between groups provides more suitable clusters for further analysis with the following variable membership<sup>8</sup>:

- Cluster 1 – trust, cooperation and ethics;
- Cluster 2 – professional development, knowledge assessment and updating;
- Cluster 3 – initiative, inclusion in decision making and knowledge application;
- Cluster 4 – performance evaluation;
- Cluster 5 - strategic planning
- Cluster 6 - creative discussions and knowledge sharing.

Scores for each case in clusters containing more than one variable were calculated as the average of individual variable scores belonging to that cluster.

### ***3.2.5 Introduction of Organizational Innovation in Latvian SMEs***

Assessing the introduction of organizational innovation, senior managers reported outsourcing the most commonly implemented form of organizational innovation in Latvian SMEs (the mean rating 5.59, where 1 indicates an OI not implemented at all and 10 indicates an OI implemented throughout the enterprise), followed by quality management systems (the mean rating 5.15), external cooperation (the mean rating 4.05) and, finally, teamwork (the mean rating 3.37) (Fig. 3.11).



**Figure 3.11 – The mean rating of OI introduction in Latvian SMEs (in scale from 1 to 10)**  
 Source: author’s calculations based on the survey data

<sup>8</sup> Ward’s clusters would be: Cluster 1 – trust, cooperation, ethics, inputs evaluated against aims, knowledge sharing, Cluster 2 – learning, Cluster 3 – initiative, inclusion in decision making, contribution to decision making (same as for average linkage), Cluster 4 – strategic planning (same as for average linkage), Cluster 5 – creative discussions, Cluster 6 – knowledge assessment and updating.

More than half (55.3%) of the surveyed enterprises had not introduced teamwork, while just 7.5% had implemented it throughout the enterprise, 29.3% had not introduced quality management systems, while 10.6% had them fully implemented, 23.5% had not introduced outsourcing, while 14.9% had it fully implemented and 42.2% had not introduced external cooperation compared to 8.4% that had them fully implemented (Fig. 3.12).

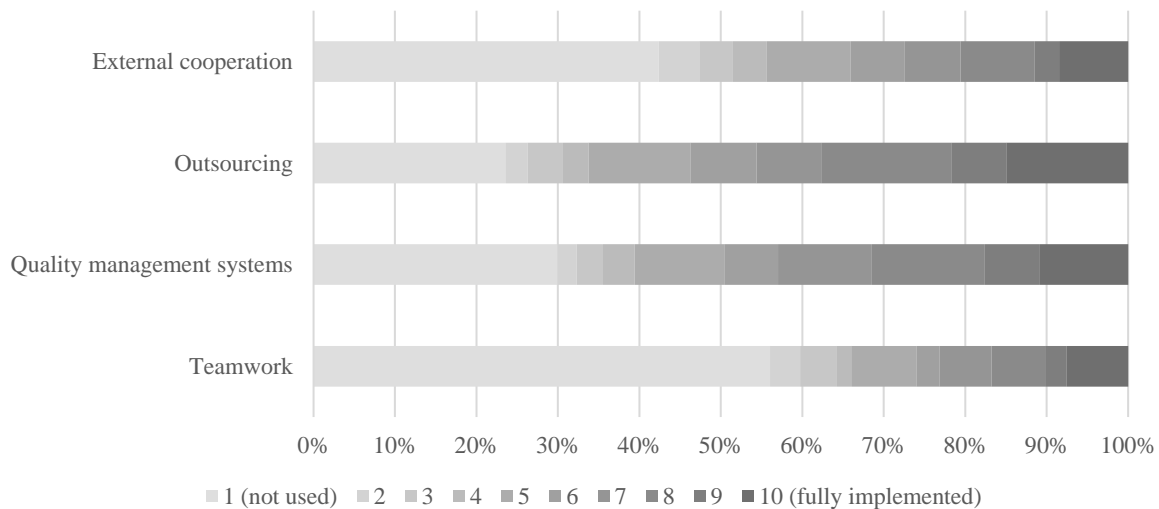


Figure 3.12 – Ratings of OI introduction in Latvian SMEs (%)

Source: author's calculations based on the survey data

Introduction of organizational innovation was related to several factors. First, the **number of employees** – the more employees an enterprise had, the more likely it was to introduce organizational innovation (Table 3.7). For instance, 68.1% micro enterprises had not introduced teamwork, compared to 45.1% of small and 34.7% of medium-sized enterprises, 36.8% had not implemented quality management systems, compared to 21.1% of small and 14.5% of medium-sized enterprises and 54.9% of micro enterprises had not implemented external cooperation compared to 30.8% of small and 25% of medium-sized enterprises.

Table 3.7 – The mean rating of introducing OI per size of enterprise (in scale from 1 to 10)

	Teamwork	Quality management systems	Outsourcing	External cooperation
Micro	2.56	4.71	5.37	3.27
Small	3.99	5.29	5.80	4.67
Medium	4.77	6.48	5.89	5.30

Source: author's calculations from survey data

This difference was statistically significant for all types of organizational innovation except outsourcing as determined by one-way ANOVA for teamwork ( $F(2, 593) = 22.753, p = .000$ ), quality management systems ( $F(2, 588) = 9.272, p = .000$ ) and external cooperation ( $F(2, 599) =$



20.008,  $p = .000$ ). Results of the Tukey post hoc test comparing differences between the groups are displayed in Table 3.8.

Table 3.8 – Multiple Comparisons for OI and the number of employees

Dependent Variable			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Teamwork	Micro	Small	-1.423*	.271	.000	-2.06	-.79
		Medium	-2.210*	.395	.000	-3.14	-1.28
	Small	Micro	1.423*	.271	.000	.79	2.06
		Medium	-.787	.408	.132	-1.75	.17
	Medium	Micro	2.210*	.395	.000	1.28	3.14
		Small	.787	.408	.132	-.17	1.75
Quality management systems	Micro	Small	-.578	.287	.111	-1.25	.10
		Medium	-1.768*	.418	.000	-2.75	-.79
	Small	Micro	.578	.287	.111	-.10	1.25
		Medium	-1.190*	.432	.017	-2.20	-.18
	Medium	Micro	1.768*	.418	.000	.79	2.75
		Small	1.190*	.432	.017	.18	2.20
External cooperation	Micro	Small	-1.399*	.275	.000	-2.04	-.75
		Medium	-2.028*	.400	.000	-2.97	-1.09
	Small	Micro	1.399*	.275	.000	.75	2.04
		Medium	-.629	.413	.282	-1.60	.34
	Medium	Micro	2.028*	.400	.000	1.09	2.97
		Small	.629	.413	.282	-.34	1.60

\*. The mean difference is significant at the 0.05 level.

Source: author's calculations, a Tukey post hoc test from survey data

The Tukey post hoc test revealed that introduction of teamwork was statistically significantly higher for small enterprises ( $3.99 \pm 3.25$ ,  $p = .000$ ) and medium-sized enterprises ( $4.77 \pm 3.39$ ,  $p = .000$ ) compared to micro enterprises ( $2.56 \pm 2.88$ ). There was no statistically significant difference between the mean ratings of introducing OI in the small and medium-sized enterprises ( $p = .132$ ).

Introduction of quality management systems was statistically significantly higher for medium-sized enterprises ( $6.48 \pm 3.02$ ,  $p = .000$ ) compared to micro enterprises ( $4.71 \pm 3.23$ ) and small enterprises ( $5.29 \pm 3.02$ ). There was no statistically significant difference between micro and small enterprises ( $p = .111$ ).

Finally, introduction of external cooperation was statistically significantly higher for small enterprises ( $4.67 \pm 3.10$ ,  $p = .000$ ) and medium-sized enterprises ( $5.30 \pm 3.36$ ,  $p = .000$ ) compared to micro enterprises ( $3.27 \pm 3.06$ ). There was no statistically significant difference between the small and medium-sized enterprises ( $p = .282$ ).

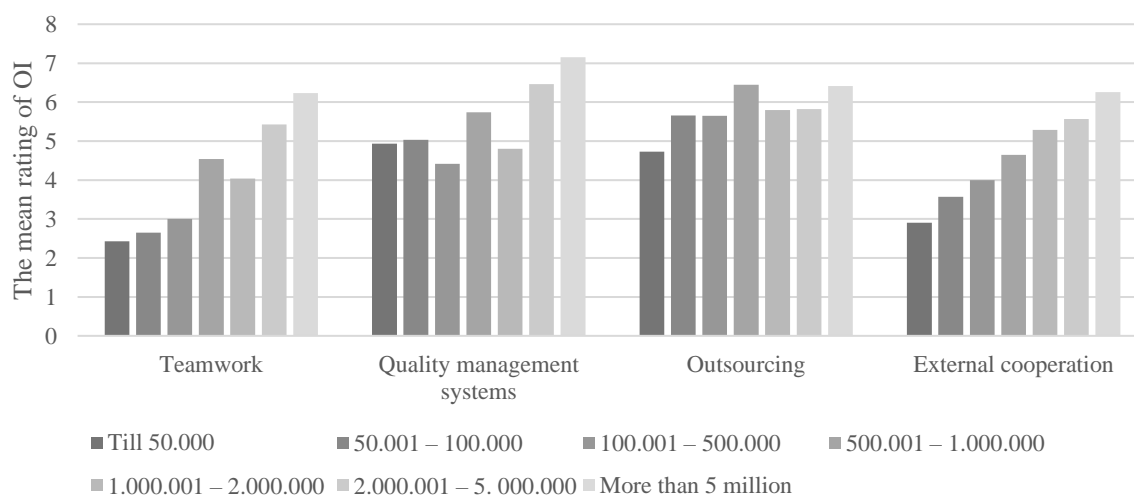
Second, similarly to the number of employees, introduction of organizational innovation was related to the **annual turnover** (Table 3.9).

**Table 3.9 – The mean rating of OI introduction per annual turnover**  
(in scale from 1 to 10)

Annual turnover, EUR	Teamwork	Quality management systems	Outsourcing	External cooperation
Till 50.000	2.43	4.93	4.73	2.90
50.001 – 100.000	2.65	5.03	5.66	3.57
100.001 – 500.000	3.00	4.42	5.65	4.00
500.001 – 1.000.000	4.54	5.74	6.45	4.65
1.000.001 – 2.000.000	4.04	4.80	5.80	5.29
2.000.001 – 5. 000.000	5.43	6.46	5.82	5.57
More than 5 million	6.23	7.15	6.41	6.26

Source: author’s calculations based on survey data

This difference was statistically significant for all types of organizational innovation as determined by one-way ANOVA for teamwork ( $F(7, 588) = 10.858, p = .000$ ), quality management systems ( $F(7, 583) = 3.976, p = .000$ ), outsourcing ( $F(7, 593) = 2.622, p = .011$ ) and external cooperation ( $F(7, 594) = 8.021, p = .000$ ). While the trend for teamwork and external cooperation is quite clear (Fig. 3.13).



**Figure 3.13 – The mean rating of OI introduction in Latvian SMEs per innovation type and the annual turnover** (in scale from 1 to 10)

Source: author’s calculations based on the survey data

A Tukey post hoc test for the introduction of teamwork (Table 3.10) revealed that this form of organizational innovation was statistically significantly higher for enterprises with the annual turnover above five hundred thousand EUR in all the defined turnover categories above that value compared to below that value.

Table 3.10 – Multiple comparisons for teamwork and the annual turnover

Dependent Variable - Teamwork		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Till 50 000 EUR	500 001 – 1 000 000 EUR	-2.115*	.427	.000	-3.41	-.82
	1 000 001 – 2 000 000 EUR	-1.614*	.487	.022	-3.10	-.13
	2 000 001 – 5 000 000 EUR	-3.003*	.564	.000	-4.72	-1.29
	More than 5 million EUR	-3.805*	.638	.000	-5.75	-1.86
50 001 – 100 000 EUR	500 001 – 1 000 000 EUR	-1.889*	.476	.002	-3.34	-.44
	2 000 001 – 5 000 000 EUR	-2.777*	.602	.000	-4.61	-.95
	More than 5 million EUR	-3.580*	.672	.000	-5.62	-1.54
100 001 – 500 000 EUR	500 001 – 1 000 000 EUR	-1.541*	.431	.009	-2.85	-.23
	2 000 001 – 5 000 000 EUR	-2.429*	.567	.001	-4.15	-.70
	More than 5 million EUR	-3.231*	.641	.000	-5.18	-1.28
500 001 – 1 000 000 EUR	Till 50 000 EUR	2.115*	.427	.000	.82	3.41
	50 001 – 100 000 EUR	1.889*	.476	.002	.44	3.34
	100 001 – 500 000 EUR	1.541*	.431	.009	.23	2.85
1 000 001 – 2 000 000 EUR	Till 50 000 EUR	1.614*	.487	.022	.13	3.10
2 000 001 – 5 000 000 EUR	Till 50 000 EUR	3.003*	.564	.000	1.29	4.72
	50 001 – 100 000 EUR	2.777*	.602	.000	.95	4.61
	100 001 – 500 000 EUR	2.429*	.567	.001	.70	4.15
More than 5 million EUR	Till 50 000 EUR	3.805*	.638	.000	1.86	5.75
	50 001 – 100 000 EUR	3.580*	.672	.000	1.54	5.62
	100 001 – 500 000 EUR	3.231*	.641	.000	1.28	5.18

\*. The mean difference is significant at the 0.05 level.

\*\* Due to the large number of categories, only groups with statistically significant relationships displayed.

Source: author's calculations, a Tukey post hoc test from survey data

A Tukey post hoc test for the introduction of quality management systems (Table 3.11) revealed that this form of organizational innovation was statistically significantly higher in enterprises with annual turnover more than five million EUR ( $7.15 \pm 3.13$ ) compared to enterprises with the annual turnover till fifty thousand EUR ( $4.93 \pm 3.51$ ,  $p = .024$ ), enterprises with the annual turnover from one hundred thousand EUR to five hundred thousand EUR ( $4.42 \pm 3.11$ ,  $p = .002$ ) and enterprises with the annual turnover from one million EUR to two million EUR ( $4.80 \pm 3.07$ ,  $p = .048$ ), as well as between enterprises with annual turnover from one hundred thousand EUR to five hundred thousand EUR and enterprises with annual turnover from two million EUR to five million EUR ( $6.46 \pm 2.66$ ,  $p = .020$ ). The differences were not statistically significant between other categories of enterprise annual turnover.

**Table 3.11 – Multiple comparisons for quality management systems and the annual turnover**

Dependent Variable - Quality management systems		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Till 50 000 EUR	More than 5 million EUR	-2.217*	.675	.024	-4.27	-.16
100 001 – 500 000 EUR	2 000 001 – 5 000 000 EUR	-2.034*	.610	.020	-3.89	-.18
1 000 001 – 2 000 000 EUR	More than 5 million EUR	-2.725*	.678	.002	-4.79	-.66
2 000 001 – 5 000 000 EUR	More than 5 million EUR	-2.344*	.766	.048	-4.68	-.01
More than 5 million EUR	100 001 – 500 000 EUR	2.034*	.610	.020	.18	3.89
	Till 50 000 EUR	2.217*	.675	.024	.16	4.27
	100 001 – 500 000 EUR	2.725*	.678	.002	.66	4.79
	1 000 001 – 2 000 000 EUR	2.344*	.766	.048	.01	4.68

\*. The mean difference is significant at the 0.05 level.

\*\* Due to the large number of categories, only groups with statistically significant relationships displayed.

Source: author's calculations, a Tukey post hoc test from survey data

A Tukey post hoc test for the introduction of outsourcing (Table 3.12) revealed that this form of organizational innovation was statistically significantly higher in enterprises with annual turnover from five hundred thousand EUR to one million EUR ( $6.45 \pm 3.05$ ) compared to enterprises with the annual turnover till fifty thousand EUR ( $4.73 \pm 3.38$ ,  $p = .005$ )

**Table 3.12 – Multiple comparisons for outsourcing and the annual turnover**

Dependent Variable - Outsourcing		Mean Difference (I-J)	Std. Error	Sig.	95% Conf. Interval	
					Lower Bound	Upper Bound
Till 50 000 EUR	500 001 – 1 000 000 EUR	-1.714*	.457	.005	-3.11	-.32
500 001 – 1 000 000 EUR	Till 50 000 EUR	1.714*	.457	.005	.32	3.11

\*. The mean difference is significant at the 0.05 level.

\*\* Due to the large number of categories, only groups with statistically significant relationships displayed.

Source: author's calculations, a Tukey post hoc test from survey data

A Tukey post hoc test for the introduction of external cooperation (Table 3.13) revealed that this form of organizational innovation was statistically significantly higher in enterprises with annual turnover from five hundred thousand EUR to one million EUR ( $4.65 \pm 3.31$ ) compared to enterprises with the annual turnover till fifty thousand EUR ( $2.90 \pm 2.93$ ,  $p = .002$ ), for enterprises with annual turnover from one million EUR to two million EUR ( $5.29 \pm 2.92$ ) compared to enterprises with the annual turnover till fifty thousand EUR ( $p = .000$ ) and enterprises with the annual turnover from fifty thousand EUR to hundred thousand EUR ( $3.57 \pm 3.05$ ,  $P = 0.34$ ), as well as between enterprises with the annual turnover from two million EUR to five million EUR ( $5.57$

$\pm 3.19$ ) compared to enterprises with the annual turnover till fifty thousand EUR ( $p= .000$ ) and enterprises with the annual turnover from fifty thousand EUR to hundred thousand EUR ( $p= .027$ ), and enterprises with the annual turnover above five million EUR ( $6.26 \pm 3.15$ ) compared to enterprises with the annual turnover till fifty thousand EUR ( $p= .000$ ), enterprises with the annual turnover from fifty thousand EUR to hundred thousand EUR ( $p= .002$ ) and enterprises with the annual turnover from hundred thousand EUR to five hundred thousand EUR ( $p= .012$ ).

**Table 3.13 – Multiple comparisons for outsourcing and the annual turnover**

Dependent Variable - External cooperation	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval		
				Lower Bound	Upper Bound	
Till 50 000 EUR	500 001 – 1 000 000 EUR	-1.750*	.439	.002	-3.09	-.41
	1 000 001 – 2 000 000 EUR	-2.395*	.501	.000	-3.92	-.87
	2 000 001 – 5 000 000 EUR	-2.673*	.580	.000	-4.44	-.91
	More than 5 million EUR	-3.361*	.646	.000	-5.33	-1.40
50 001 – 100 000 EUR	1 000 001 – 2 000 000 EUR	-1.721*	.542	.034	-3.37	-.07
	2 000 001 – 5 000 000 EUR	-1.998*	.616	.027	-3.87	-.12
	More than 5 million EUR	-2.686*	.678	.002	-4.75	-.62
100 001 – 500 000 EUR	More than 5 million EUR	-2.259*	.648	.012	-4.23	-.29
500 001 – 1 000 000 EUR	Till 50 000 EUR	1.750*	.439	.002	.41	3.09
	Till 50 000 EUR	2.395*	.501	.000	.87	3.92
	50 001 – 100 000 EUR	1.721*	.542	.034	.07	3.37
	Till 50 000 EUR	2.673*	.580	.000	.91	4.44
	50 001 – 100 000 EUR	1.998*	.616	.027	.12	3.87
	Till 50.000 EUR	3.361*	.646	.000	1.40	5.33
	50 001 – 100 000 EUR	2.686*	.678	.002	.62	4.75
	100 001 – 500 000 EUR	2.259*	.648	.012	.29	4.23

\*. The mean difference is significant at the 0.05 level.

\*\* Due to the large number of categories, only groups with statistically significant relationships displayed.

Source: author's calculations, a Tukey post hoc test from survey data

Third, **younger enterprises** were more likely to introduce outsourcing, while older enterprises - external cooperation (Table 3.14).

**Table 3.14 – Years in industry and the mean introduction of OI**  
(in scale from 1 to 10)

	Teamwork	Quality management systems	Outsourcing	External cooperation
1 to 3 years	3.85	5.08	7.85	3.46
4 to 9 years	3.51	4.91	6.09	3.87
10 to 20 years	3.16	5.06	5.32	3.72
More than 20 years	3.54	5.48	5.43	4.69

Source: author's calculations based on survey data

The difference was statistically significant as determined by one-way ANOVA for outsourcing ( $F(3, 597) = 4.051, p = .007$ ) and external cooperation ( $F(3, 598) = 3.729, p = .011$ )<sup>9</sup>. A Tukey post hoc test (Table 3.15) revealed that companies that had been in their industries for one to three years were statistically significantly more likely to introduce outsourcing ( $7.85 \pm 2.12$ ) than those working for ten to twenty years ( $5.32 \pm 3.27, p = .030$ ) and those working more than twenty years ( $5.43 \pm 3.27, p = .046$ ), while there was no statistically significant difference between enterprises that than been working one to three years and four to nine years ( $p = .237$ ) and other groups (four to nine years vs. all other groups, ten to twenty years vs. more than twenty years).

Table 3.15 – Multiple comparisons for the mean introduction of OI and the number of employees

Dependent Variable			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Outsourcing	1 to 3 years	4 to 9 years	1.756	.933	.237	-.65	4.16
		10 to 20 years	2.530*	.916	.030	.17	4.89
		More than 20 years	2.414*	.924	.046	.03	4.80
	4 to 9 years	1 to 3 years	-1.756	.933	.237	-4.16	.65
		10 to 20 years	.774	.335	.097	-.09	1.64
		More than 20 years	.658	.358	.257	-.26	1.58
	10 to 20 years	1 to 3 years	-2.530*	.916	.030	-4.89	-.17
		4 to 9 years	-.774	.335	.097	-1.64	.09
		More than 20 years	-.116	.310	.982	-.91	.68
	More than 20 years	1 to 3 years	-2.414*	.924	.046	-4.80	-.03
		4 to 9 years	-.658	.358	.257	-1.58	.26
		10 to 20 years	.116	.310	.982	-.68	.91
External cooperation	1 to 3 years	4 to 9 years	-.407	.924	.971	-2.79	1.97
		10 to 20 years	-.259	.906	.992	-2.59	2.08
		More than 20 years	-1.228	.915	.536	-3.58	1.13
	4 to 9 years	1 to 3 years	.407	.924	.971	-1.97	2.79
		10 to 20 years	.147	.332	.971	-.71	1.00
		More than 20 years	-.822	.354	.094	-1.73	.09
	10 to 20 years	1 to 3 years	.259	.906	.992	-2.08	2.59
		4 to 9 years	-.147	.332	.971	-1.00	.71
		More than 20 years	-.969*	.306	.009	-1.76	-.18
	More than 20 years	1 to 3 years	1.228	.915	.536	-1.13	3.58
		4 to 9 years	.822	.354	.094	-.09	1.73
		10 to 20 years	.969*	.306	.009	.18	1.76

\*. The mean difference is significant at the 0.05 level.

Source: author's calculations, a Tukey post hoc test from survey data

Fourth, enterprises with more than 50% of **foreign investment** in their equity capital had a greater likelihood to introduce any form of organizational innovation compared to enterprises without foreign investment (Table 3.16).

<sup>9</sup> Full ANOVA analysis provided in Annex 6

Table 3.16 – **The level of Foreign investment and the mean introduction of OI**  
(in scale from 1 to 10)

	Teamwork	Quality management systems	Outsourcing	External cooperation
At least 50% of foreign capital	5.30	6.85	7.18	6.07
Less than 50% of foreign capital	3.27	5.06	5.52	3.96

Source: author's calculations based on survey data

The difference was statistically significant between groups as determined by one-way ANOVA for teamwork ( $F(3, 592) = 4.907, p = .002$ ), quality management systems ( $F(3, 587) = 2.939, p = .033$ ) and external cooperation ( $F(3, 598) = 4.252, p = .006$ ), as well as with slightly lower significance for outsourcing ( $F(3, 597) = 2.570, p = .053$ ).

Fifth, the analysis revealed **regional differences** in the likelihood to introduce certain forms of organizational innovation, Table 3.17.

Table 3.17 – **Location and the mean introduction of OI (in scale from 1 to 10)**

	Teamwork	Quality management systems	Outsourcing	External cooperation
Riga	4.02	5.76	5.98	4.12
Greater Riga	3.23	4.89	5.62	3.63
Vidzeme	2.55	4.67	4.77	3.69
Kurzeme	2.73	4.45	5.35	3.98
Zemgale	3.73	5.16	5.79	4.38
Latgale	3.27	5.35	5.56	4.54
Large cities	3.15	4.58	5.36	3.99
Towns	2.99	5.10	5.36	4.07
Rural	3.18	5.03	5.58	4.01

Source: author's calculations based on survey data

Considering the type of region (Riga, large cities, towns, rural), the difference was statistically significant between groups as determined by one-way ANOVA for teamwork ( $F(3, 592) = 3.543, p = .014$ ) and quality management systems ( $F(3, 587) = 3.517, p = .015$ ), while considering the region (Riga, Greater Riga, Vidzeme, Kurzeme, Zemgale and Latgale) the difference was statistically significant between groups as determined by one-way ANOVA for teamwork ( $F(5, 590) = 3.470, p = .004$ ) and quality management systems ( $F(5, 585) = 2.511, p = .029$ ).

A Tukey post hoc test (Table 3.18) revealed that enterprises from Riga were statistically significantly more likely to introduce teamwork ( $4.02 \pm 3.49$ ) than those from small towns ( $2.99 \pm 3.00, p = .023$ ), while there was no statistically significant difference between enterprises from Riga and large cities ( $3.15 \pm 3.04, p = .072$ ), between Riga and rural enterprises ( $3.18 \pm 2.96, p =$

.080), as well as between large cities and other cities ( $p=.978$ ), as well as between other cities and rural ( $p=.958$ ). Enterprises from Riga were more likely to introduce quality management systems ( $5.76 \pm 3.35$ ,  $p = .008$ ) than those from large cities ( $4.58 \pm 3.18$ ), at the same time there were no statistically significant differences between enterprises from Riga and small towns ( $5.10 \pm 3.31$ ,  $p= .285$ ), between enterprises from Riga and rural enterprises ( $5.03 \pm 3.16$ ,  $p= .188$ , and between other groups.

Table 3.18 – Multiple comparisons for introduction of OI and the type of region

Dependent Variable			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval		
						Lower Bound	Upper Bound	
Teamwork	Riga	Large cities	.877	.360	.072	-.05	1.81	
		Other cities	1.030*	.360	.023	.10	1.96	
		Rural	.842	.352	.080	-.07	1.75	
	Large cities	Riga	-.877	.360	.072	-1.81	.05	
		Other cities	.153	.381	.978	-.83	1.13	
		Rural	-.035	.373	1.000	-1.00	.93	
	Other cities	Riga	-1.030*	.360	.023	-1.96	-.10	
		Large cities	-.153	.381	.978	-1.13	.83	
		Rural	-.189	.373	.958	-1.15	.77	
	Rural	Riga	-.842	.352	.080	-1.75	.07	
		Large cities	.035	.373	1.000	-.93	1.00	
		Other cities	.189	.373	.958	-.77	1.15	
	Quality management systems	Riga	Large cities	1.182*	.372	.008	.22	2.14
			Other cities	.665	.374	.285	-.30	1.63
			Rural	.734	.366	.188	-.21	1.68
Large cities		Riga	-1.182*	.372	.008	-2.14	-.22	
		Other cities	-.517	.394	.556	-1.53	.50	
		Rural	-.448	.386	.653	-1.44	.55	
Other cities		Riga	-.665	.374	.285	-1.63	.30	
		Large cities	.517	.394	.556	-.50	1.53	
		Rural	.069	.389	.998	-.93	1.07	
Rural		Riga	-.734	.366	.188	-1.68	.21	
		Large cities	.448	.386	.653	-.55	1.44	
		Other cities	-.069	.389	.998	-1.07	.93	

\*. The mean difference is significant at the 0.05 level.

Source: author's calculations, a Tukey post hoc test from survey data

Similarly, a Tukey post hoc test (Table 3.19) revealed that enterprises from Riga were statistically significantly more likely to introduce teamwork ( $4.02 \pm 3.49$ ) than those from Vidzeme ( $2.55 \pm 2.74$ ,  $p= .010$ ) and from Kurzeme ( $2.73 \pm 2.66$ ,  $p= .024$ ), while there was no statistically significant difference between enterprises from Riga and the Greater Riga ( $3.23 \pm 3.10$ ,  $p = .317$ ), between Riga and Zemgale ( $3.73 \pm 3.30$ ,  $p= .985$ ), between Riga and Latgale ( $3.27 \pm 3.03$ ,  $p = .460$ ), as well as between the regions. And on average more enterprises from Riga had introduced quality management systems ( $5.76 \pm 3.35$ ) than those from Kurzeme ( $4.45 \pm 3.28$ ,  $p= .029$ ), at the same time there were no statistically significant differences between enterprises from Riga and other regions and between the other groups.



Table 3.19 – Multiple Comparisons for OI and the region\*\*

Dependent Variable		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Teamwork	Greater Riga	0.795	0.388	0.317	-0.32	1.9
	Vidzeme	1.475*	0.438	0.01	0.22	2.73
	Kurzeme	1.294*	0.416	0.024	0.11	2.48
	Zemgale	0.29	0.434	0.985	-0.95	1.53
	Latgale	0.753	0.416	0.46	-0.44	1.94
Quality management systems	Greater Riga	0.869	0.407	0.27	-0.29	2.03
	Vidzeme	1.09	0.455	0.159	-0.21	2.39
	Kurzeme	1.315*	0.432	0.029	0.08	2.55
	Zemgale	0.602	0.45	0.765	-0.69	1.89
	Latgale	0.416	0.433	0.93	-0.82	1.66

\*. The mean difference is significant at the 0.05 level.

\*\* Due to the large number of categories, only groups with statistically significant relationships displayed.

Source: author's calculations, a Tukey post hoc test from survey data

The author also notes that the proportion of micro, small and medium-sized enterprises in Riga and in regions is quite similar, thus excluding a conclusion that enterprises from Riga are on average more innovative due to a significant over indexation of medium-sized enterprises in the capital (Table 3.20).

Table 3.20 – Enterprises by location and size (%)

	Micro	Small	Medium	Total
Riga	52%	34%	14%	100%
Other regions	50%	39%	12%	100%

Source: author's calculation based on survey data

Finally, the enterprises had a different likelihood to introduce organizational innovation depending on the **industry** (Table 3.21).

Table 3.21 – Industry and the mean introduction of OI (in scale from 1 to 10)

	Teamwork	Quality management systems	Outsourcing	External cooperation
Agriculture (A)	3.15	4.74	5.77	4.91
Manufacturing (B, C)	3.92	5.98*	5.61	4.39
Construction (F)	4.73*	5.56	6.79*	3.46
Trade (G)	2.73*	4.94	4.37*	3.53*
Services (H-N, R-S)	3.26	4.92	5.76	4.17
Education, health (P, Q)	2.92	5.43	5.41	3.97

\*. Significant at the 0.05 level.

Source: author's calculations based on survey data

Considering that some enterprises could operate in more than one industry, the comparison was made between enterprises belonging to the industry and those, who do not belong to the industry.

Manufacturing enterprises were more likely to introduce quality management systems than enterprises operating in other industries as determined by one-way ANOVA ( $F(1, 589) = 6.248, p = .013$ ). Construction enterprises were more likely to introduce teamwork as determined by one-way ANOVA ( $F(1, 594) = 13.152, p = .000$ ) and outsourcing ( $F(1, 599) = 9.778, p = .002$ ) compared to those not belonging to the industry. Trade enterprises were significantly less likely to introduce teamwork as determined by one-way ANOVA ( $F(1, 594) = 7.109, p = .008$ ), outsourcing ( $F(1, 599) = 24.838, p = .000$ ) and external cooperation ( $F(1, 600) = 4.463, p = .035$ ) compared to those operating in other industries. At the same time, service enterprises and enterprises operating in education and health sector did not have any such statistically significant differences compared to other industries.

**3.3 Regression Models and Impact on Innovativeness and Competitiveness**

Finally, the relationship between organizational culture, knowledge management and introduction of organizational innovation in Latvian SMEs was assessed using multiple linear regression analysis.

**3.3.1 Measurement of organizational innovation introduction**

The empirical research of the doctoral thesis considered introduction of four types of organizational innovation – teamwork, quality management systems, outsourcing and external cooperation – and the extent to which a certain type of innovation had been implemented, ranging from not used at all till fully implemented throughout the enterprise. The organizational innovation introduction measure (OIM) – an average of the four variables measuring introduction of organizational innovation was calculated as the dependent variable for the regression analysis. The histogram of OIM is displayed in Fig. 3.14.

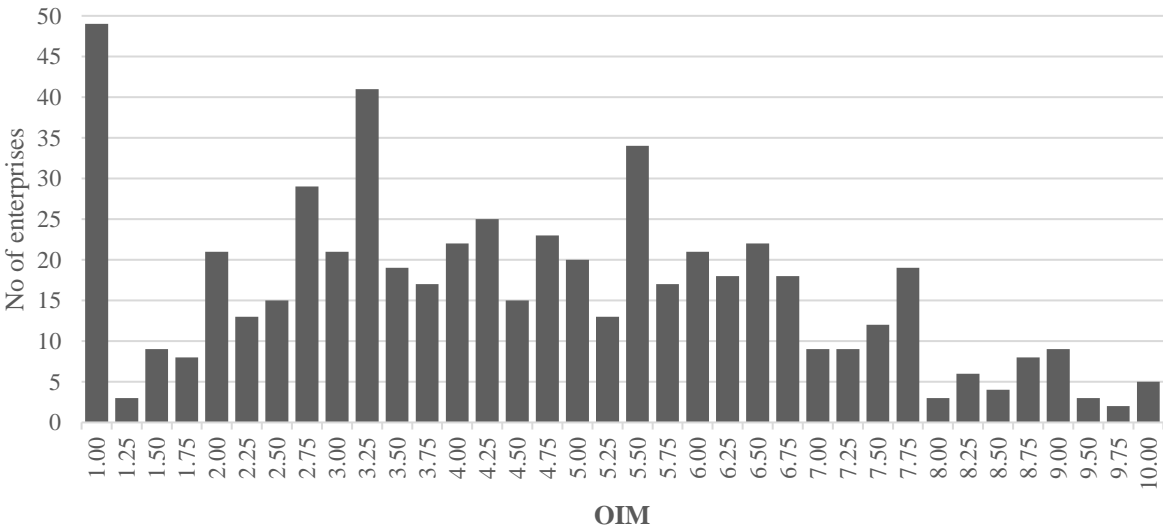


Figure 3.14 – **Histogram of the OIM** (n = 582)  
 Source: author’s calculations based on the survey data

The OIM ranges from 1 to 10 and has a mean of 4.54. Forty-nine (8.4%) enterprises had not introduced any kind of organizational innovation, leading to an OIM value of 1, while five (0.8%) enterprises had fully implemented all four types of OI, leading to an OIM of 10.

### ***3.3.2 Selection and preparation of predictors for the model***

Based on the theoretical rationale and previous studies, the regression model assumes that introduction of organizational innovation depends on organizational culture, knowledge management processes and the previously discussed enterprise factors - the number of employees, the annual turnover<sup>10</sup>, location, industry, the number of years an enterprise has been operating in this industry, and the level of foreign investment, which would indicate that the enterprise is likely part of a larger, international enterprise or enterprise group.

#### *Selection of organizational culture and knowledge management indicators*

Six previously developed clusters of organizational culture and knowledge management processes were considered for the regression analysis: 1) trust, cooperation and ethics; 2) professional development and knowledge assessment and updating (development and updating), 3) initiative, inclusion in decision making and knowledge application (initiative and participation), 4) performance evaluation, 5) long-term strategic planning and 6) creative discussions and knowledge sharing (knowledge creation and sharing). In order to include them in the model, they should not very highly correlate with each other and they should correlate with the dependent variable, the OIM. As these indicators and the formed clusters are quantitative, the relation is assessed using a parametric test using Pearson correlation (Table 3.22).

According to Field (2018, p. 534), correlations between the independent variables that exceed 0.8 should be a significant concern for multicollinearity. All the correlations between the independent variables in Table 3.22 are statistically significant, yet all are below 0.6.

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<sup>10</sup> The rationale of the enterprise characterizing factor causality is the following – e.g. for industry - manufacturing enterprises are more innovative than trade enterprises, the difference of organizational innovation introduction depends on the industry, and it would not be likely that enterprises operate in manufacturing, because they are more innovative. This causality could be both ways for turnover - enterprises may be more likely to introduce organizational innovation, when they have more resources, at the same time they may have greater turnover, because they have successfully introduced innovation in past. In any case, there's a strong theoretical rationale to consider that turnover in terms of the available resources is linked to introduction of organizational innovation, and thus it is included in the model.

Table 3.22 – **Pearson correlation matrix for organizational culture and knowledge management indicators and OIM**

	Development and updating	Initiative and participation	Performance evaluation	Strategic planning	Knowledge creation and sharing	OIM
Trust, cooperation, ethics	.392**	.517**	.415**	.184**	.489**	.068
Development and updating		.571**	.438**	.442**	.498**	.315**
Initiative and participation			.486**	.315**	.599**	.247**
Performance evaluation				.246**	.354**	.207**
Strategic planning					.369**	.350**
Knowledge creation and sharing						.289**

\*\* Correlation significant at the 0.01 level (2-tailed)

Source: author's calculations based on the survey data

However, **trust, cooperation and ethics** does not statistically significantly correlate with the OIM. This could be due to the reason of high ratings of trust, cooperation and ethics being very common amongst enterprises (the mean value for the cluster =  $8.17 \pm 1.43$ ), and, in fact, more common for micro and small enterprises than for medium-sized enterprises. Assessing the impact of trust, cooperation and ethics on organizational innovation per enterprise size, the indicators are statistically significantly positively related in medium-sized enterprises (Pearson correlation 0.417, statistically significant at the 0.01 level, 2 tailed), while the relation is much weaker for small enterprises (Pearson correlation 0.137, statistically significant at the 0.05 level, 2 tailed), and no statistically significant relation exists between the indicators in micro-enterprises.

Further assessing, whether a lack of trust, cooperation and ethics negatively affect introduction of organizational innovation, thirty-seven enterprises (6.3%) of the sample rated trust, cooperation and ethics on average below 6<sup>11</sup>. The mean of OIM is 4.17 for enterprises with lower trust, cooperation and ethics ratings and 4.58 for enterprises with higher ratings of the same cluster, yet the independent samples t-test with equal variances not assumed does not determine that these 6.3% of enterprises with lower trust, cooperation and ethics ratings would be significantly less likely to introduce organizational innovation compared to enterprises with higher ratings (Table 3.23).

<sup>11</sup> Meaning that they on average more disagreed with trust, cooperation and ethics statements than agreed to them

Table 3.23 – **Independent Samples t-test for lack of trust, cooperation and ethics and introduction of OI**

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
OIM	Equal variances assumed	.233	<b>.630</b>	-1.090	571	.276	-.41434	.38020	-1.16110	.33242
	Equal variances not assumed			-1.110	40.055	<b>.273</b>	-.41434	.37318	-1.16853	.33985

Source: author's calculations based on the survey data

Thus, the clusters of development and updating, initiative and participation, performance evaluation, long-term strategic planning, and knowledge creation and sharing are further considered in the regression analysis, while the cluster measuring trust, cooperation and ethics is not included.

*Selection of enterprise characterizing factors*

The previous analysis indicated that the **number of employees** is significantly linked to the likelihood of introducing organizational innovation. One-way ANOVA for the number of employees ( $F(2, 579) = 22.841, p = .000$ ) confirm that there are statistically significant differences in OIM depending on the number of employees (Table 3.24).

Table 3.24 – **One-way ANOVA for the number of employees and the OIM**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	208.216	2	104.108	22.841	.000
Within Groups	2639.001	579	4.558		
Total	2847.217	581			

Source: author's calculations based on the survey data

A Tukey post hoc test (Table 3.25) reveals that introduction of organizational innovation is statistically significantly higher for small enterprises ( $4.94 \pm 2.25, p = .000$ ) and medium-sized enterprises ( $5.59 \pm 2.16, p = .000$ ) compared to micro enterprises ( $3.98 \pm 2.04$ ).

Table 3.25 – **Multiple comparisons for the OIM and the number of employees**

Dependent Variable – OIM		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Micro	Small	-.96513*	.19102	.000	-1.4140	-.5163
	Medium	-1.61669*	.27966	.000	-2.2738	-.9596
Small	Micro	.96513*	.19102	.000	.5163	1.4140
	Medium	-.65156	.28836	.062	-1.3291	.0260
Medium	Micro	1.61669*	.27966	.000	.9596	2.2738
	Small	.65156	.28836	.062	-.0260	1.3291

\*. The mean difference is significant at the 0.05 level.

Source: author's calculations, a Tukey post hoc test from survey data

While the Tukey post hoc test does not detect statistically significant differences between small and medium-sized enterprises, while assessing all industries together, such differences exist for some of the industries. For instance, Table 3.26 displays Tukey post hoc test for manufacturing and construction enterprises, where differences between all three groups are statistically significant: introduction of organizational innovation is statistically significantly higher for small enterprises ( $5.23 \pm 2.15$ ,  $p = .008$ ) and medium-sized enterprises ( $6.33 \pm 1.89$ ,  $p = .000$ ) compared to micro enterprises ( $4.08 \pm 1.89$ ), at the same time it is also statistically significantly higher for small enterprises compared to medium-sized enterprises ( $p = .047$ )

**Table 3.26 – Multiple comparisons for the OIM and the number of employees for manufacturing and construction enterprises**

Dependent Variable – OIM	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval		
				Lower Bound	Upper Bound	
Micro	Small	-1.15887*	.38202	.008	-2.0641	-.2537
	Medium	-2.25536*	.47440	.000	-3.3794	-1.1313
Small	Micro	1.15887*	.38202	.008	.2537	2.0641
	Medium	-1.09649*	.45762	.047	-2.1808	-.0122
Medium	Micro	2.25536*	.47440	.000	1.1313	3.3794
	Small	1.09649*	.45762	.047	.0122	2.1808

\*. The mean difference is significant at the 0.05 level.

Source: author's calculations, a Tukey post hoc test from survey data

Thus, all three size categories – micro, small and medium-sized enterprises - are considered for the regression model.

Second, the previous analysis showed that the **annual turnover** is significantly linked to the likelihood of introducing organizational innovation. One-way ANOVA for the annual turnover ( $F(6, 540) = 12.495$ ,  $p = .000$ ) confirm that there are statistically significant OIM differences depending on the annual turnover (Table 3.27).

**Table 3.27 – One-way ANOVA for the annual turnover and the OIM**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	321.567	6	53.594	12.495	0.000
Within Groups	2316.193	540	4.289		
Total	2637.760	546			

Source: author's calculations based on the survey data

According to the previous analysis, the main differences between the groups are related to introduction of teamwork and external cooperation between enterprises having the annual turnover till five hundred thousand EUR, where mean OIM is 4.05, and for enterprises having the annual turnover above five hundred thousand EUR, where the mean OIM is 5.49.

At the same time, the annual turnover is closely linked to the number of employees – both conceptually as both are measures of enterprise size per the number of resources, and empirically

(see Figure 3.1). Both factors – the size per the number of employees and the annual turnover are considered for further analysis in the regression models, while monitoring the correlation between them.

Third, considering the **location**, introduction of organizational innovation statistically significantly differs between Riga and small towns, as well as between Riga and two of the regions. As no statistically significant differences exist between other categories, a transformed independent variable is further included in the regression analysis, indicating, whether the enterprise is located in Riga or not<sup>12</sup>. The mean OIM in enterprises from Riga is 5.01, while other enterprises have the mean OIM of 4.35. An independent samples t-test with equal variances not assumed indicates that these differences are statistically significant, and enterprises from Riga are more likely to introduce organizational innovation than others (Table 3.28).

Table 3.28 – Independent Samples t-test for the OIM and location

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Conf. Interval of the Difference	
									Lower	Upper
OIM	Equal variances assumed	1.799	<b>.180</b>	3.286	580	.001	.65749	.20012	.26445	1.05053
	Equal variances not assumed			3.191	296.224	<b>.002</b>	.65749	.20606	.25196	1.06301

Source: author’s calculations based on the survey data

Fourth, the previous analysis revealed some differences in introduction of organizational innovation depending on the **years in industry**. However, one-way ANOVA for the years of operating in industry ( $F(3, 578) = 1.592, p = .190$ ) does not confirm statistically significant OIM differences (Table 3.29).

Table 3.29 – One-way ANOVA for the years in industry and the OIM

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	23.338	3	7.779	1.592	.190
Within Groups	2823.879	578	4.886		
Total	2847.217	581			

Source: author’s calculations based on the survey data

Further tests were performed to see, if any subset of enterprises by the years in industry has a statistically significantly different likelihood to introduce organizational innovation. The mean OIM was higher for enterprises operating from one to three years (5.06), then decreased for

<sup>12</sup> The author also tested a location variable with four categories (Riga, large cities, small towns, and rural) in the regression analysis, however it did not improve the regression model due to the lack of differences between most of the categories.

enterprises operating from four to nine years (4.60) and from ten to twenty years (4.33), it was higher again for enterprises operating more than twenty years (4.76).

The mean OIM particularly differed per years in industry for the newest trade enterprises (Table 3.30)

**Table 3.30 – Mean OIM depending on the number of years in industry**

		Manufacturing (B, C)	Construction (F)	Trade (G)	Services (H-N, R-S)
Years in industry	1 to 3 years	5.17	4.50	5.50	4.55
	4 to 9 years	4.35	5.43	4.05	4.63
	10 to 20 years	5.04	4.48	3.70	4.31
	More than 20 years	5.22	5.83	3.97	4.75

Source: author’s calculations based on the survey data

At the same time, the sample includes just thirteen cases of such new enterprises, and no clear trend can be observed in other subsets of this category, thus the division per years in industry is not included in further analysis.

Fifth, the previous analysis indicates that enterprises with significant **foreign investment** tend to introduce organizational innovation more than enterprises without foreign investment. An independent samples t-test with equal variances not assumed indicates that these differences are statistically significant, and enterprises with significant foreign investment are more likely to introduce organizational innovation than others (Table 3.31). Thus, the level of foreign investment is considered as a factor for regression analysis.

**Table 3.31 – Independent Samples t-test for the OIM and foreign investment**

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2- tailed)	Mean Difference	Std. Error Difference	95% Conf. Interval of the Difference	
									Lower	Upper
OIM	Equal variances assumed	0.206	<b>0.650</b>	4.258	579	0.000	1.86521	0.43807	1.00480	2.72562
	Equal variances not assumed			3.978	27.057	<b>0.000</b>	1.86521	0.46886	0.90328	2.82714

Source: author’s calculations based on the survey data

Table 3.32 provides an overview of the correlations between the predictors considered for the regression analysis. Non-parametric Kendall's tau b and Spearman's rho coefficients are used to include categorical and ordinal variables characterizing the enterprise. Table 3.32 does not repeat the parametric correlations between the organizational culture and knowledge management clusters, which are already covered in Table 3.22.



Table 3.32 – Nonparametric correlation analysis of regression model predictors

	Turnover	Location	Foreign investment	OIM	
Kendall's tau b	Development and updating	.041	.040	.046	.224**
	Initiative and participation	-.073*	.039	.074*	.161**
	Performance evaluation	-.003	.042	.039	.133**
	Strategic planning	.146**	.007	.132**	.260**
	Knowledge creation and sharing	-.072*	.035	.078*	.190**
	Number of employees	.648**	-.006	.150**	.212**
	Turnover		.002	.181**	.243**
	Location			.034	.107**
	Foreign investment				.135**
Spearman's rho	Development and updating	.049	.048	.055	.304**
	Initiative and participation	-.098**	.047	.088*	.228**
	Performance evaluation	-.034	.047	.044	.177**
	Strategic planning	.187**	.008	.152**	.349**
	Knowledge creation and sharing	-.096*	.041	.092*	.262**
	Number of employees	.724**	-.007	.157**	.265**
	Turnover		.019	.204**	.320**
	Location			.034	.129**
	Foreign investment				.162**

\*\* Correlation significant at the 0.01 level (2-tailed)

Source: author's calculations based on the survey data

Finally, introduction of organizational innovation **differs between industries**. To illustrate these differences, Table 3.33 includes the mean OIM values for micro, small and medium-sized enterprises operating in different industries. It shows that construction enterprises tend to be the most innovative, followed by manufacturing, service and, lastly, trade enterprises across the categories per the number of employees. It also shows a clear trend that small enterprises are more innovative than microenterprises while less innovative than medium-sized enterprises operating in the same industry for manufacturing, construction and services, while such a trend does not exist in trade.

Table 3.33 – The mean OIM depending on industry and the number of employees

Number of employees	Manufacturing (B, C)	Construction (F)	Trade (G)	Services (H-N, R-S)
1 – 9 employees (micro)	4.03	4.11	3.76	4.05
10 – 49 employees (small)	5.00	5.64	4.13	4.96
50 – 249 employees (medium)	6.14	6.81	4.04	5.46

Source: author's calculations based on the survey data

Considering these differences between industries, the regression analysis is conducted separately for manufacturing (NACE B, C) and construction (F), trade (G) and services (H-N, R-S). Manufacturing and construction are included in the same regression model, considering the number of cases (86 manufacturing and 63 construction enterprises), the previous predictor and organizational innovation analysis, and lack of statistically significant differences in the mean

OIM between these two industries as detected by the one-way ANOVA ( $F(1, 138) = .202, p = .654$ ) (Table 3.34).

Table 3.34 – **One-way ANOVA for the OIM in manufacturing and construction industries**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.947	1	.947	.202	.654
Within Groups	647.962	138	4.695		
Total	648.909	139			

Source: author’s calculations based on the survey data

### 3.3.3 Assumptions and the regression method

Based on Field (2018), the regression analysis considers the following assumptions.

*Additivity and linearity* – the model assumes a linear relation between various organizational culture, knowledge management and enterprise profile factors and the OIM, and it assumes that the combined effect is best described by adding their effects together.

*Independent errors* – the regression model assumes uncorrelated residual terms for any two observations, this lack of autocorrelation is tested Durbin–Watson test, when conducting the analysis.

*Homoscedasticity* – the model assumes a constant variance of the residual terms at each level of the predictor variables.

*Predictors are uncorrelated with “external variables”* – the model assumes that within the scope of the study, there should be no external variables that significantly influence the variables included in the regression model.

*Variable types:* the model has five quantitative predictor variables - clustered factors of organizational culture and knowledge management processes, as well as categorical predictor variables - number of employees (three categories), annual turnover (seven categories), location (two categories), and the level of foreign investment (two categories)<sup>13</sup>. Industry is an additional influencing factor; a model is developed for each industry separately. The outcome variable - the OIM – is quantitative, continuous and unbounded.

*No perfect multicollinearity:* the predictor variables should not correlate too highly; this assumption was addressed in the part describing the predictors of the model.

*Non-zero variance:* all predictors have some variation in value.

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<sup>13</sup> According to the approach by Field (2018, Section 10.4) on including categorical predictors with two categories into a linear regression model

### ***Regression method***

General equation for multiple linear regression:

$$y_i = b_0 + \sum_{j=1}^k b_j x_{ij} + \varepsilon_i \quad (i=1, \dots, n) \quad (2)$$

where:  $y_i$  – dependent variable,  
 $x_i$  – predictors,  
 $b_0, b_j$  – intercept, slope coefficients,  
 $k$  – the number of explanatory variables,  
 $e$  – the model's error term,  
 $n$  – sample size.

As recommended by Field (2018), the backward selection method is used to decide the factors for the regression models. Backward selection allows to exclude non-significant variables and addresses the forward solution's problem of assessing just those factors not included in the model, thus potentially leading to one or more of the already included factors becoming non-significant. At the same time, it avoids the issues of stepwise methods of less likelihood to generalize across samples.

Backward model starts with all factors included, and removes variables using criterion: probability of F-to-remove  $\geq .100$  till reaching a more consistent model in terms of Goodness of Fit and generalizability of sample results to the entire population. That last model will be also the most parsimonious, it will include the lowest number of predictors.

#### ***3.3.4 Regression results***

##### **Manufacturing and Construction**

A multiple linear regression was calculated to predict the OIM in manufacturing and construction enterprises based on organizational culture and knowledge management indicators - professional development and knowledge updating, initiative and participation, performance evaluation, strategic planning, knowledge creation and sharing, as well as enterprise factors – the annual turnover, location, size and foreign investment. All potential predictors were considered and initially included in the regression model, and then excluded using a backward criterion (probability of F-to-remove  $\geq .100$ ). Table 3.35 summarizes the linear regression models.

Predictors initiative and participation, foreign investment, development and updating, location and the number of employees were removed from the model in that order due to lack of statistical significance. Strategic planning, performance evaluation, knowledge creation and sharing and turnover remain significant predictors in the model.

Table 3.35 – Comparison of the Regression Models - Manufacturing and Construction

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	,606 <sup>a</sup>	0.367	0.319	1.74981	0.367	7.728	9	120	0.000
2	,605 <sup>b</sup>	0.366	0.324	1.74395	-0.001	0.191	1	120	0.663
3	,604 <sup>c</sup>	0.365	0.328	1.73857	-0.001	0.248	1	121	0.619
4	,599 <sup>d</sup>	0.359	0.327	1.73978	-0.006	1.172	1	122	0.281
5	,592 <sup>e</sup>	0.350	0.324	1.74376	-0.008	1.568	1	123	0.213
6	,585 <sup>f</sup>	0.342	0.321	1.74834	-0.009	1.657	1	124	0.200

a. Predictors: size, initiative, location, foreign investment, strategic planning, performance evaluation, knowledge creation and sharing, development and updating, turnover

b. Predictors: size, location, foreign investment, strategic planning, performance evaluation, knowledge creation and sharing, development and updating, turnover

c. Predictors: size, location, strategic planning, performance evaluation, knowledge creation and sharing, development and updating, turnover

d. Predictors: size, location, strategic planning, performance evaluation, knowledge creation and sharing, turnover

e. Predictors: size, strategic planning, performance evaluation, knowledge creation and sharing, turnover

f. Predictors: strategic planning, performance evaluation, knowledge creation and sharing, turnover

Dependent Variable: OIM

Source: author's calculations in SPSS based on the survey data

Performing case wise diagnostics for a model with four predictors to assess any bias in the model (Annex 8), none of the cases had a Cook's distance greater than 1, while two had a Mahalanobis distance above 15.

When assessing the covariance ratio (CVR), if:

$$CVR_i > 1 + \left[ \frac{3(k+1)}{n} \right] \quad (1)$$

or

$$CVR_i < 1 - \left[ \frac{3(k+1)}{n} \right] \quad (2)$$

(3)

where:

k - the number of predictors in the model

CVR<sub>i</sub> - the covariance ratio for the *i*th case

n - the sample size.

covariance ratio limits for this analysis range from  $1 - [3*(4+1)/132] = 0.8864$  till  $1 + [3*(4+1)/132] = 1.1136$ . The same case was outside the covariance ratio limits; thus, it was excluded as an outlier. Following these steps, it is possible to conclude that no case has an undue influence on the model.

Table 3.36 shows a summary for the model 6, calculated with four significant predictors (strategic planning, performance evaluation, knowledge creation and sharing and turnover), and excluding the case discussed above, using enter method and bootstrapping for a more robust model.

**Table 3.36 – Regression Model Summary - Manufacturing and Construction**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
6	.581 <sup>a</sup>	0.338	0.316	1.73520	0.338	16.049	4	126	0.000

a. Predictors: turnover, knowledge creation and sharing, strategic planning, performance evaluation.  
 Dependent Variable: OIM

Source: author’s calculations in SPSS based on the survey data

The model explains 33.8% of the OIM variability. The adjusted R square is slightly lower, indicating that the model would account for 2% less variance, if it was derived from the population rather than the sample. Table 3.37 indicates that independent variables statistically significantly predict the dependent variable,  $F(4, 126) = 16.049, p=0.000$ , meaning that the regression model is a good fit for the data.

**Table 3.37 – Regression Model ANOVA - Manufacturing and Construction**

Model		Sum of Squares	df	Mean Square	F	Sig.
6	Regression	193.287	4	48.322	16.049	.000
	Residual	379.374	126	3.011		
Total		572.661	130			

Dependent Variable: OIM,

b. Predictors: turnover, knowledge creation and sharing, strategic planning, performance evaluation.

Source: author’s calculations in SPSS based on the survey data

Table 3.38 with model parameters indicate the individual contribution of predictor variables to the regression model. It indicates that all three independent variables statistically significantly contribute to the prediction.

**Table 3.38 – Regression Parameter Estimates– Manufacturing and Construction**

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Bootstrap					Correlations			Collinearity Statistics		
	B	Std. Error	Beta			Bias	Std. Error	Sig. (2-t.)	B Interval		Zero-order	Partial	Part	Tolerance	VIF	
									Lower	Upper						
(Constant)	-0.403	0.812		-0.496	0.621	-0.035	0.814	0.629	-2.027	1.106						
Strategic planning	0.133	0.066	0.163	2.014	0.046	0.002	0.068	0.053	0.007	0.263	0.373	0.177	0.146	0.802	1.246	
Performance evaluation	0.188	0.097	0.160	1.943	0.054	0.007	0.105	0.073	-0.012	0.396	0.337	0.171	0.141	0.779	1.283	
K. creation and sharing	0.215	0.100	0.172	2.151	0.033	-0.003	0.100	0.033	0.001	0.405	0.306	0.188	0.156	0.819	1.222	
Turnover	0.457	0.093	0.374	4.923	0.000	-0.001	0.091	0.001	0.279	0.627	0.455	0.402	0.357	0.912	1.096	

Dependent Variable: OIM, bootstrap results are based on 1000 bootstrap samples.

Source: author’s calculations in SPSS based on the survey data

The regression equation for manufacturing and construction is:

$$OIM_i = -0.403 + 0.133 * strat.plan + 0.188 * perf.eval. + 0.215 * k.creation\ and\ sharing + 0.457 * turnover + \epsilon_i \quad (i=1, \dots, 131) \quad (4)$$

where:  $OIM_i$  – OIM assessment obtained by the regression model,  
 strat. plan. - long-term strategic planning indicator,  
 perf. eval. – performance evaluation indicator,  
 k. creation and sharing - knowledge creation and sharing indicator,  
 turnover – the category of the annual turnover,  
 $\epsilon$  – the model’s error term,  
 i – sample size.

The standardized coefficients indicate that all predictors - turnover, knowledge creation and sharing, strategic planning and performance evaluation - have a comparably large effect on introduction of organizational innovation in manufacturing and construction sectors, with the effect of turnover being the largest. Coefficients of each predictor are in bootstrap confidence intervals and significant based on 1000 bootstrap samples, do not rely on assumptions of normality or homoscedasticity of the sample. The predictors do not have significant multicollinearity as VIF values are significantly below 10 and the tolerance statistics are significantly above 0.2.

Collinearity Diagnostics (Table 3.39) indicate that each predictor has a high proportion on a different eigenvalue to other predictors.

**Table 3.39 – Regression Collinearity Diagnostics – Manufacturing and Construction**

	Eigenvalue	Condition Index	Variance Proportions				
			(Constant)	Strategic planning	Performance evaluation	Knowledge creation and sharing	Turnover
1	4.716	1.000	0.00	0.00	0.00	0.00	0.01
2	0.145	5.695	0.01	0.00	0.02	0.03	0.91
3	0.082	7.586	0.03	0.98	0.02	0.04	0.04
4	0.032	12.182	0.00	0.01	0.66	0.68	0.00
5	0.025	13.835	0.95	0.01	0.30	0.25	0.04

Dependent Variable: OIM

Source: author’s calculations in SPSS based on the survey data

Finally, Fig. 3.15 shows regression standardized residuals and Annex 9 includes scatterplot of standardized predicted values against standardized residuals as well as partial regression plots for this analysis.

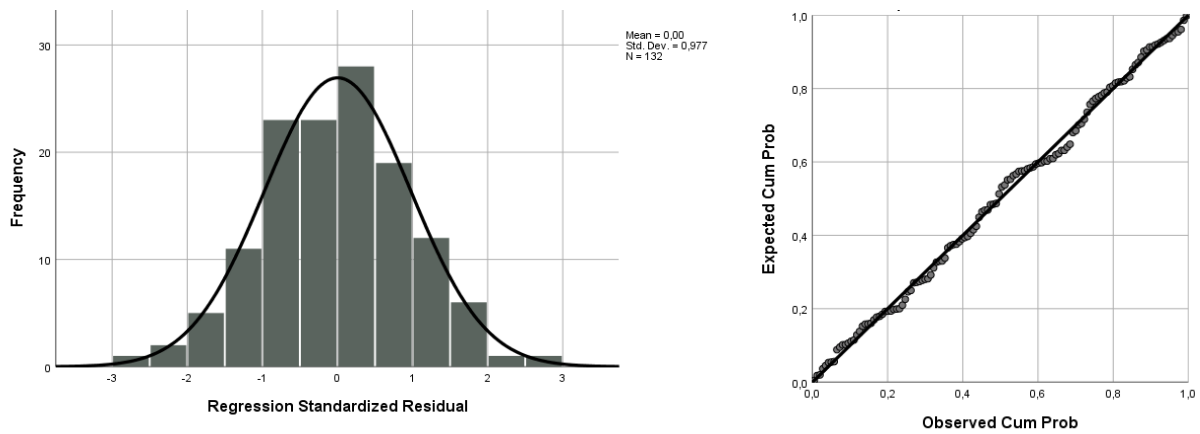


Figure 3.15 – Regression standardized residuals - manufacturing and construction, dependent variable - OIM

Source: author’s model based on the survey data

### Trade

A multiple linear regression was calculated to predict the OIM in trade enterprises based on organizational culture and knowledge management indicators - professional development and knowledge updating, initiative and participation, performance evaluation, strategic planning, knowledge creation and sharing, as well as enterprise factors – the annual turnover, location, size and foreign investment. All potential predictors were considered and initially included in the regression model, and then excluded using a backward criterion (probability of F-to-remove  $\geq$  .100). Table 3.40 summarizes the linear regression models.

Predictors foreign investment, knowledge creation and sharing, size, performance evaluation and initiative and participation were removed from the model in that order due to lack of statistical significance. Development and updating, location, strategic planning and turnover remain significant predictors in the model.

Table 3.40 –Regression Model Comparison for OIM in Trade Sector

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	,702 <sup>a</sup>	0.493	0.445	1.53283	0.493	10.267	9	95	0.000
2	,702 <sup>b</sup>	0.493	0.451	1.52494	0.000	0.015	1	95	0.903
3	,700 <sup>c</sup>	0.491	0.454	1.52056	-0.002	0.444	1	96	0.507
4	,698 <sup>d</sup>	0.487	0.456	1.51821	-0.004	0.697	1	97	0.406
5	,693 <sup>e</sup>	0.480	0.453	1.52115	-0.007	1.383	1	98	0.242
6	,685 <sup>f</sup>	0.470	0.448	1.52817	-0.010	1.925	1	99	0.168

a. Predictors: size, development and updating, location, foreign investment, performance evaluation, strategic planning, knowledge creation and sharing, initiative and participation, turnover

b. Predictors: size, development and updating, location, performance evaluation, strategic planning, knowledge creation and sharing, initiative and participation, turnover

c. Predictors: size, development and updating, location, performance evaluation, strategic planning, initiative and participation, turnover

d. Predictors: development and updating, location, perf. evaluation, strategic planning, initiative and participation, turnover

e. Predictors: development and updating, location, strategic planning, initiative and participation, turnover

f. Predictors: development and updating, location, strategic planning, turnover

Dependent Variable: OIM

Source: author’s calculations in SPSS based on the survey data

Performing case wise diagnostics for a model with four predictors to assess any bias in the model (Annex 8), none of the cases had a Cook's distance greater than one or Mahalanobis distance above fifteen, however two were significantly outside the covariance ratio limits, for this analysis ranging from  $1 - [3*(4+1)/105] = 0.8571$  till  $1 + [3*(4+1)/105] = 1.1429$  (please see the formula for CVR calculations in the sector describing the regression model for manufacturing and construction enterprises) and were also outside three standard deviations. Excluding these two cases as outliers, it is possible to conclude that no case has an undue influence on the model.

Table 3.41 shows a summary for the model 6, calculated with four significant predictors (location, development and updating, strategic planning and turnover), and excluding the two cases discussed above, using enter method and bootstrapping for a more robust model.

**Table 3.41 –Regression Model Summary for OIM in Trade Sector**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
6	,681 <sup>a</sup>	0.464	0.443	1.52260	0.464	22.895	4	106	.000

a. Predictors: turnover, location, development and updating, strategic planning. Dependent Variable: OIM

Source: author's calculations in SPSS based on the survey data

The model explains 46.4% of the OIM variability. The adjusted R square is slightly lower, indicating that the model would account for 2% less variance, if it was derived from the population rather than the sample. Table 3.42 indicates that independent variables statistically significantly predict the dependent variable,  $F(4, 106) = 22.895$ ,  $p=0.000$ , meaning that the regression model is a good fit for the data.

**Table 3.42 – ANOVA for the Regression Model in Trade Sector**

Model	Sum of Squares	df	Mean Square	F	Sig.
6 Regression	212.311	4	53.078	22.895	.000
Residual	245.740	106	2.318		
Total	458.051	110			

Dependent Variable: OIM, b. Predictors: turnover, location, development and updating, strategic planning

Source: author's calculations in SPSS based on the survey data

Table 3.43 with model parameters indicate the individual contribution of predictor variables to the regression model. All three independent variables statistically significantly contribute to the prediction.



Table 3.43 – Regression Parameter Estimates – Trade

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Bootstrap					Correlations			Collinearity Statistics	
	B	Std. Error				Beta	Bias	Std. Error	Sig. (2-t.)	B Interval		Zero-order	Partial	Part	Tolerance
			Lower							Upper					
(Constant)	-0.321	0.482		-0.667	0.506	0.012	0.445	0.453	-1.182	0.556					
Development and updating	0.220	0.068	0.279	3.213	0.002	-0.004	0.070	0.002	0.080	0.351	0.461	0.298	0.229	0.670	1.493
Location	1.461	0.342	0.305	4.268	0.000	0.000	0.341	0.002	0.784	2.124	0.333	0.383	0.304	0.993	1.007
Strategic planning	0.210	0.076	0.250	2.776	0.007	0.004	0.076	0.009	0.073	0.365	0.505	0.260	0.197	0.625	1.600
Turnover	0.323	0.083	0.289	3.896	0.000	-0.006	0.083	0.001	0.149	0.474	0.370	0.354	0.277	0.918	1.090

Dependent Variable: OIM, bootstrap results are based on 1000 bootstrap samples.

Source: author’s calculations in SPSS based on the survey data

The regression equation for trade is:

$$OIM_i = -0.321 + 0.220 * dev.and\ updating + 1.461 * location + 0.210 * strat.plan + 0.323 * turnover + \epsilon_i \quad (i=1, \dots, 111) \quad (5)$$

where: OIM<sub>i</sub> – OIM assessment obtained by the regression model,  
 dev. and updating – professional development and knowledge updating indicator,  
 location – category of the place of operation,  
 strat. plan – long-term strategic planning indicator  
 turnover – category of the annual turnover  
 e – the model’s error term,  
 i – sample size.

The standardized coefficients indicate that all three predictors have a comparably large effect on introduction of organizational innovation in trade enterprises. Coefficients of each predictor are in bootstrap confidence intervals and significant based on 1000 bootstrap samples, do not rely on assumptions of normality or homoscedasticity of the sample. The predictors do not have significant multicollinearity as VIF values are significantly below 10 and the tolerance statistics are significantly above 0.2.

Collinearity Diagnostics (Table 3.44) indicate that each predictor has a relatively high proportion on a different eigenvalue to other predictors.

Table 3.44 – Regression Collinearity Diagnostics – Trade

	Eigenvalue	Condition Index	Variance Proportions				
			(Constant)	Turnover	Location	Development and updating	Strategic planning
1	3.955	1.000	0.01	0.01	0.02	0.01	0.00
2	0.717	2.349	0.00	0.01	0.96	0.00	0.00
3	0.209	4.346	0.01	0.82	0.02	0.09	0.02
4	0.067	7.707	0.98	0.09	0.00	0.24	0.09
5	0.052	8.748	0.01	0.07	0.00	0.66	0.88

Dependent Variable: OIM

Source: author’s calculations in SPSS based on the survey data

Finally, Fig. 3.16 shows regression standardized residuals, while Annex 9 - scatterplots of standardized predicted values against standardized residuals, which are randomly and relatively evenly dispersed throughout the plot, as well as partial regression plots.

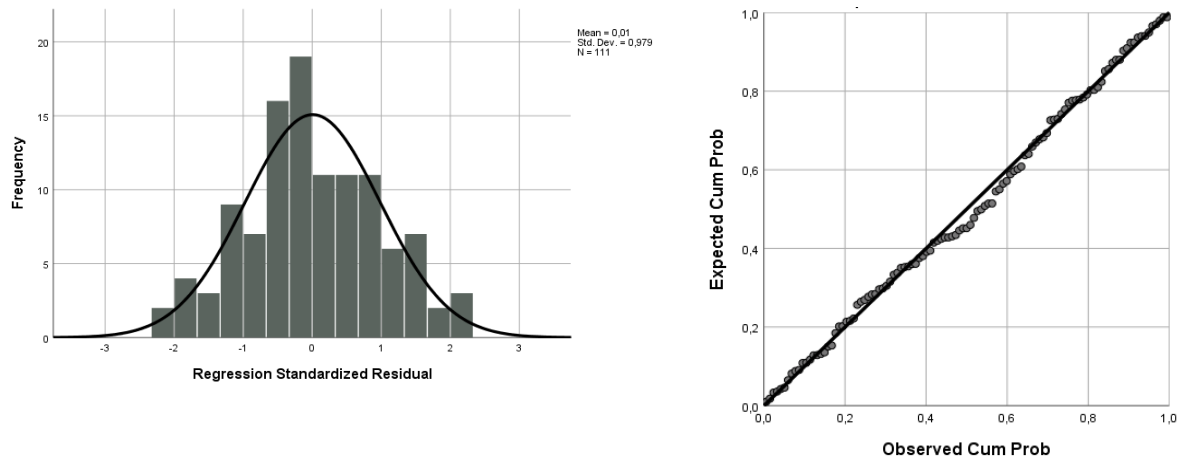


Figure 3.16 – **Regression standardized residuals – trade, dependent variable - OIM**  
Source: author’s model based on the survey data

### Services

A multiple linear regression was calculated to predict the OIM in manufacturing and construction enterprises based on organizational culture and knowledge management indicators - professional development and knowledge updating, initiative and participation, performance evaluation, strategic planning, knowledge creation and sharing, as well as enterprise factors – the annual turnover, location, size and foreign investment. All potential predictors were considered and initially included in the regression model, and then excluded using a backward criterion (probability of F-to-remove  $\geq .100$ ). Table 3.45 summarizes the linear regression models.

Table 3.45 – **Regression Model Comparison for OIM in Service Sector**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	,560 <sup>a</sup>	0.314	0.286	1.81887	0.314	11.241	9	221	0.000
2	,560 <sup>b</sup>	0.314	0.289	1.81478	0.000	0.002	1	221	0.966
3	,558 <sup>c</sup>	0.312	0.290	1.81381	-0.002	0.762	1	222	0.384
4	,556 <sup>d</sup>	0.309	0.290	1.81364	-0.003	0.958	1	223	0.329
5	,551 <sup>e</sup>	0.304	0.288	1.81626	-0.005	1.649	1	224	0.200

a. Predictors: size, performance evaluation, location, foreign investment, knowledge creation and sharing, strategic planning, development and updating, turnover, initiative and participation

b. Predictors: size, performance evaluation, location, foreign investment, knowledge creation and sharing, strategic planning, turnover, initiative and participation

c. Predictors: size, performance evaluation, location, foreign investment, knowledge creation and sharing, strategic planning, turnover

d. Predictors: performance evaluation, location, foreign investment, knowledge creation and sharing, strategic planning, turnover

e. Predictors: performance evaluation, location, knowledge creation and sharing, strategic planning, turnover

Dependent Variable: OIM

Source: author’s calculations in SPSS based on the survey data

Predictors development and updating, initiative and participation, size and foreign investment were removed from the model in that order due to lack of statistical significance. Performance evaluation, location, knowledge creation and sharing, strategic planning, turnover in the model.

Performing case wise diagnostics, one case was outside three standard deviations and also had a Mahalanobis distance above fifteen, thus was excluded from the model. Four more cases had a Mahalanobis distance above fifteen and were significantly outside the covariance ratio limits, for this analysis ranging from  $1 - [3*(5+1)/239] = 0.9247$  till  $1 + [3*(5+1)/239] = 1.0753$  (please see the formula for CVR calculations in the sector describing the regression model for manufacturing and construction enterprises). Performing the analysis excluding the five cases discussed above, two of the predictors are no longer statistically significant, thus are removed. Table 3.46 shows a summary for the model calculated with the three remaining significant predictors (strategic planning, knowledge creation and sharing, turnover), using enter method and bootstrapping for a more robust model.

**Table 3.46 –Regression Model Summary for OIM in Service Sector**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
5	.557 <sup>a</sup>	0.310	0.302	1.76679	0.310	35.539	3	237	.000

a. Predictors: turnover, strategic planning, knowledge creation and sharing. Dependent: OIM

Source: author’s calculations in SPSS based on the survey data

The model explains 31% of the OIM variability. The adjusted R square is slightly lower, indicating that the model would account for 0.8% less variance, if it was derived from the population rather than the sample. Table 3.47 indicates that independent variables statistically significantly predict the dependent variable,  $F(3, 237) = 35.539, p=0.000$ , meaning that the regression model is a good fit for the data.

**Table 3.47 – ANOVA for the Regression Model in Service Sector**

Model	Sum of Squares	df	Mean Square	F	Sig.
6 Regression	332.806	3	110.935	35.539	.000
Residual	739.804	237	3.122		
Total	1072.609	240			

Dependent: OIM, b. Predictors: turnover, strategic planning, knowledge creation and sharing.

Source: author’s calculations in SPSS based on the survey data

Table 3.48 with model parameters indicate the individual contribution of predictor variables to the regression model.

Table 3.48 – **Regression Parameter Estimates– Services**

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Bootstrap					Correlations			Collinearity Statistics	
	B	Std. Error				Beta	Bias	Std. Error	Sig. (2-t.)	B Interval		Zero-order	Partial	Part	Tolerance
			Lower	Upper											
(Constant)	-0.470	0.521		-0.903	0.367	0.034	0.485	0.330	-1.354	0.537					
Strategic planning	0.157	0.051	0.181	3.060	0.002	-4E-05	0.055	0.006	0.048	0.265	0.358	0.195	0.165	0.828	1.207
Knowledge creation and sharing	0.377	0.064	0.349	5.845	0.000	-0.003	0.056	0.001	0.255	0.475	0.349	0.355	0.315	0.818	1.223
Turnover	0.457	0.069	0.371	6.600	0.000	-0.003	0.066	0.001	0.325	0.587	0.334	0.394	0.356	0.923	1.083

Dependent Variable: OIM, bootstrap results are based on 1000 bootstrap samples.

Source: author’s calculations in SPSS based on the survey data

All three independent variables statistically significantly contribute to the prediction.

The regression equation for services is:

$$OIM_i = -0.470 + 0.157 * strat.plan + 0.377 * k.creation\ and\ sharing + 0.457 * turnover + \epsilon_i \quad (i=1, \dots, 241) \quad (6)$$

where: OIM<sub>i</sub> – OIM assessment obtained by the regression model,  
 k. creation and sharing - knowledge creation and sharing indicator,  
 strat. plan. - long-term strategic planning indicator,  
 turnover – category of the annual turnover,  
 e – the model’s error term,  
 i – sample size.

The standardized coefficients indicate turnover has the most significant effect on introduction of organizational innovation in service enterprises, followed by knowledge creation and sharing and strategic planning. Coefficients of each predictor are in bootstrap confidence intervals and significant based on 1000 bootstrap samples, do not rely on assumptions of normality or homoscedasticity of the sample. The predictors do not have significant multicollinearity as VIF values are significantly below 10 and the tolerance statistics are significantly above 0.2.

Collinearity Diagnostics (Table 3.49) indicate that each predictor has a relatively high proportion on a different eigenvalue to other predictors.

Table 3.49 – **Regression Collinearity Diagnostics – Services**

	Eigenvalue	Condition Index	Variance Proportions			
			(Constant)	Strat. plan.	Knowledge	Turnover
1	3.653	1.000	0.00	0.01	0.00	0.02
2	0.246	3.856	0.01	0.02	0.03	0.80
3	0.072	7.125	0.12	0.96	0.11	0.00
4	0.029	11.229	0.87	0.01	0.85	0.18

Dependent Variable: OIM

Source: author’s calculations in SPSS based on the survey data

Finally, Fig. 3.17 shows regression standardized residuals, while Annex 9 - scatterplots of standardized predicted values against standardized residuals, which are randomly and relatively evenly dispersed throughout the plot, as well as partial regression plots.

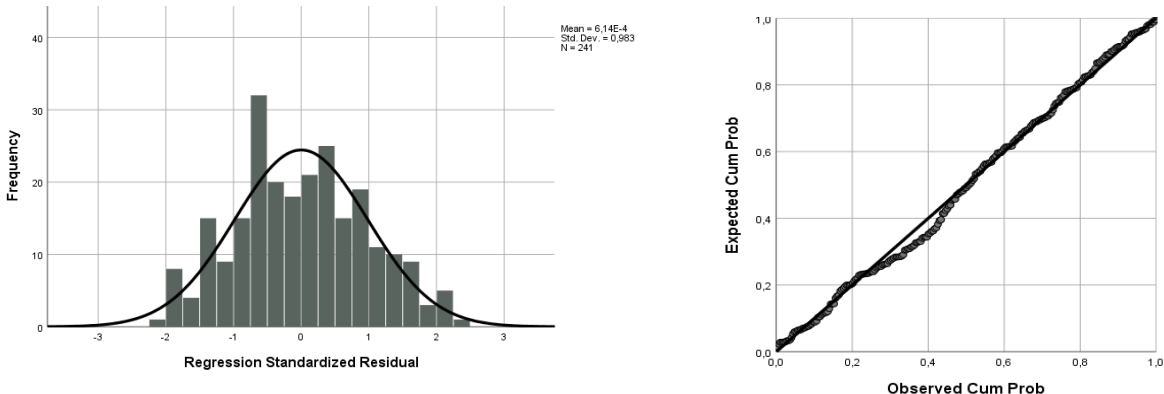


Figure 3.17 – Regression standardized residuals – services, dependent variable - OIM  
 Source: author’s model based on the survey data

As the previous analysis suggest, turnover and strategic planning can explain the OIM in enterprises across industries, while the other factors in various industries differ (Fig. 3.18) - knowledge creation and sharing and performance evaluation explain the OIM in manufacturing and construction enterprises, professional development and knowledge updating explain the OIM in manufacturing and construction enterprises, professional development and knowledge updating, and the location explain the OIM in trade enterprises, and knowledge creation and sharing explain the OIM in service enterprises.

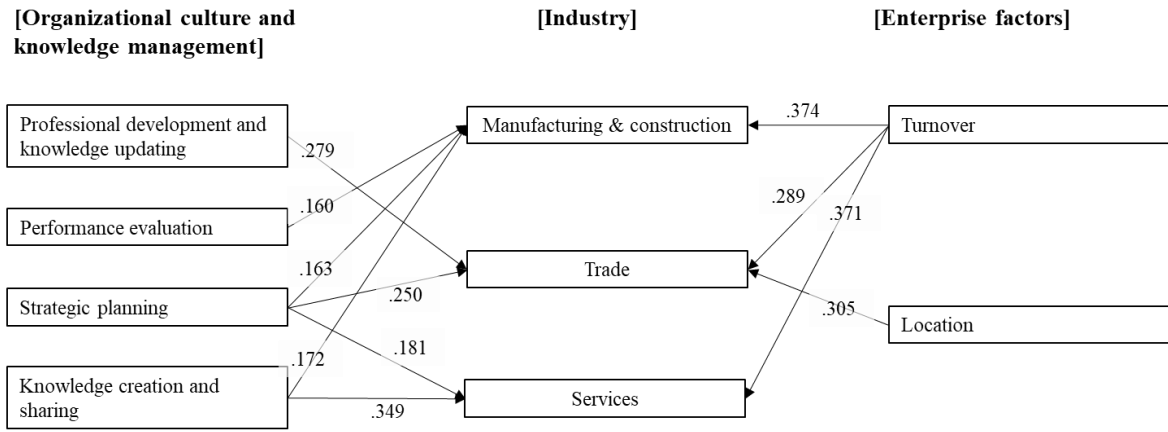


Figure 3.18 – Standardized coefficients of the independent variables in the OIM regression models

Source: developed by author based on the survey data

### 3.3.5 Impact on Innovativeness and Competitiveness

Senior managers of the surveyed enterprises that had implemented organizational innovation generally agreed that it helped these enterprises to become more innovative and competitive (Fig. 3.19). More than half (56.7%) of senior managers agreed that introduction of OI helped to increase enterprise's competitiveness, of them 16.2% rated this statement above 8, while 11.77% rated it below 3. Similarly, 55.5% of senior managers agreed that the enterprise improved its ability to introduce other innovations, such as new products, services or marketing methods, of them 14.1% rated it above 8 and 14.3% rated it below 3.

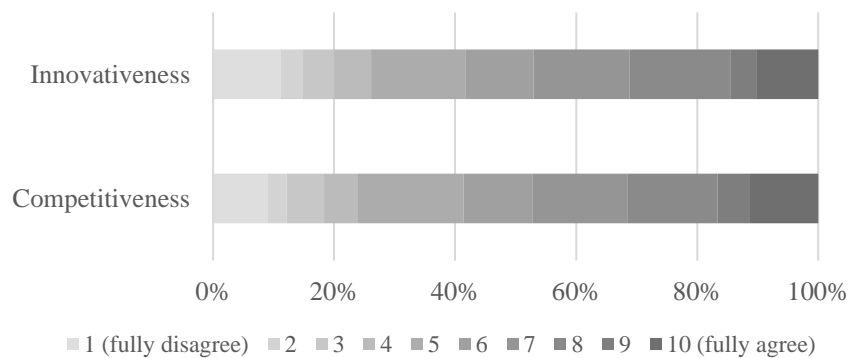


Figure 3.19– **The extent to which managers agreed that implementing OI contributed to enterprise competitiveness and innovativeness of Latvian SMEs (%)**

Source: author's calculations based on the survey data

The impact of organizational innovation to competitiveness and innovativeness depended on the level and the number of innovations the enterprises had implemented. Senior managers from enterprises that had implemented at least one form organizational innovation to an average level (above 5), rated the impact to competitiveness on average at 5.10, those, that had implemented two forms of organizational innovation, found a greater impact on competitiveness and rated it on average at 6.71, and enterprises that had implemented three or four types of organizational innovation, rated the impact to competitiveness on average at 7.22 and 7.66. Similarly, enterprises that had not implemented any innovation at least at average level, rated the impact on innovativeness on average at 4.43, those that had implemented one form – on average at 4.83, those that had implemented two forms – on average at 6.60 and those that had implemented three or four forms – on average at 6.96 and 7.60.

Introduction of OI statistically significantly correlated to enterprise competitiveness and innovativeness - Pearson correlation between the OIM and competitiveness was 0.464 and between the OIM and Innovativeness 0.452 (Table 3.49). When assessing various types of OI, all statistically significantly correlated with competitiveness and innovativeness. Table 3.53 shows Pearson correlation coefficients for each type considering only enterprises, which had implemented the particular type of OI. Quality management systems were the most influential type

of OI in terms of competitiveness (Pearson correlation .438) and innovativeness (Pearson correlation 0.420), followed by external cooperation (Pearson correlation 0.377 for competitiveness and 0.291 for innovativeness). Enterprises that found OI beneficial for competitiveness commonly found them beneficial also for innovativeness (Pearson correlation .669, for medium-sized enterprises 0.709).

**Table 3.50 – Pearson Correlation matrix for OI, competitiveness and innovativeness**

	Competitiveness	Innovativeness
OIM	.464**	.452**
Teamwork	.306**	.283**
Quality management systems	.438**	.420**
Outsourcing	.297**	.253**
External cooperation	.377**	.291**

\*\* Correlation significant at the 0.01 level (2-tailed)

Source: author’s calculations based on the survey data

This confirms that introduction of organization innovation is generally beneficial for SMEs, as OI enhances their competitiveness and serves as an enabler for other types of innovation.

**3.4 Discussion with managers of Latvian enterprises**

The research results were discussed with managers during an enterprise seminar dedicated to the theme how organizational culture can foster organizational innovation (an overview of the discussion included in Annex 10).

During the seminar, the author presented the empirical study, discussed the anthropological approach to organizational culture, general framework for knowledge management and organizational innovation, the conceptual model of organizational culture, knowledge management and organizational innovation, and the main research conclusions.

Following the presentation, managers formed three groups.

The first group discussed, how organizational culture and knowledge management practices can foster innovation and shared the best practices amongst them. Managers suggested an internal job shadowing to foster internal knowledge transfer process and increase awareness of the value each employee adds to the enterprise. They also discussed the importance of an open, inclusive leadership that encourages participation. One of the participants highlighted the role that organizational culture played, when revising the quality standards from ISO 9001:2008 to ISO 9001:2015, becoming an integral part of a business approach towards quality. Managers also discussed the importance of informal brainstorming and networking between employees and suggested providing employees new perspectives by organizing activities outside the casual

business environment. Participants shared a knowledge creation method, where employees can suggest better products and processes based on their personal experiences, perceived market needs and external environment, including products offered by the competition. Managers also suggested a system of recognizing and rewarding employees for innovative ideas and special contribution to the enterprise; they considered this as an essential tool for increasing employee motivation and participation and highlighted the importance of the managers being open to innovative ideas. Finally, managers shared experiences on boosting innovation, for instance, by allowing employees to determine their salaries.

The second group discussed, how Latvian SMEs can become more innovative; what are the main challenges and the main business implications. Latvia is a small market and sometimes there is little demand for innovations, especially outside Riga, at the same time, many SMEs are exporting and face global competition, and Latvia has success stories of globally innovative enterprises even in very traditional sectors. Innovation requires a change, at the same time employees are often against the change and prefer predictable processes. Thus, it can be a managerial challenge to encourage change and provide support, making employees, especially the lower level workers, comfortable with it. Managers highlighted the importance of an open internal communication. Managers also emphasized the need of an organizational structure and vision that leadership shares with employees, thus creating a common understanding of the main aims and direction for further development.

The third group discussed, how enterprises can improve their external image. Managers discussed the role of internal working culture, including value integration and attitude towards employees. Organizations can benefit from activities they do, but also from not doing the wrong things. Employees often are motivated, and organizations should give those employees an opportunity to participate and deliver results without demotivating them. Managers shared the need to provide training and education for employees – both internally and externally. Managers discussed the importance of providing competitive salaries and other benefits to those contributing to the organization. Managers discussed that organizations should focus on strengthening their teams, improving communications and providing feedback to employees. Managers suggested developing a positive image of the leadership and of a socially responsible enterprise to enhance the public image of the enterprise externally. Managers agreed with the importance of an open, inclusive leadership that encourages employee participation in innovative enterprises. They also suggested that organizational culture is an integral part of a business approach towards quality.



### **3.5 Discussion and managerial implications**

The research results indicate that organizational culture in Latvian SMEs is frequently characterized by cooperation and trust. Senior managers almost to the same level agree that employees follow the principles of business ethics in their work and that employee performance is evaluated against the aims of the enterprise. Organizational culture is slightly less characterized by an inclusive decision making, long-term strategic planning and employee initiative looking for new opportunities. Evaluating knowledge management processes, senior managers found knowledge sharing on average the most common, while creative discussions – on average the least common in Latvian SMEs. Various aspects of organizational culture were positively related to knowledge management, indicating that enterprises with more innovation enhancing organizational culture had more developed knowledge management processes.

Assessing the introduction of organizational innovation, senior managers reported outsourcing the most commonly implemented form of organizational innovation in Latvian SMEs, followed by quality management systems and external cooperation, while teamwork was on average less implemented. 8.11% of the surveyed enterprises had not implemented any form of organizational innovation at all, while 24.8% had implemented all assessed forms of organizational innovation at least partially. At the same time, 40.4% of enterprises had not implemented any of the innovations throughout the organization, 29.5% had implemented one, 18.1% - two, and 12.09% more forms of organizational innovation throughout the organization.

Introduction of organizational innovation was related to several enterprise factors. Firstly, the doctoral thesis confirms the relation between the number of employees and innovativeness – the more employees an enterprise had, the more likely it was to introduce organizational innovation (as suggested by Schmidt and Rammer, 2006; Mol and Birkinshaw, 2009; Laforet, 2016; Arranz et al., 2019, and others). Secondly, the annual turnover – the bigger the annual turnover, the higher the likelihood of introducing organizational innovation, likely due to available resources for innovative activities (as also discussed by Damanpour, 1991, Nohria and Gulati, 1996). Thirdly, the foreign ownership - enterprises with more than 50% of foreign investment in their equity capital had a greater likelihood to introduce any form of organizational innovation compared to enterprises without a foreign ownership. Foreign ownership imply that the enterprise is more internationally focused, likely a part of an international enterprise group or network, and the findings relate to previous studies (e.g. Mol and Birkinshaw, 2009) finding enterprises with a broader geographical market scope as more innovative. Fourth, enterprises from Riga were more likely to innovate, particularly by introducing teamwork and quality management systems, compared to enterprises from towns and those located in Kurzeme and Zemgale. This could be explained by different external environment and more intense competition in Riga, and thus an

increasing need for companies to differentiate. Finally, the enterprises had a different likelihood to innovate depending on the industry they operated. Manufacturing enterprises were more likely to introduce quality management systems, construction enterprises were more likely to introduce teamwork and outsourcing, while trade enterprises were generally less likely to innovate.

The results confirm that organizational culture can influence introduction of organizational innovation. Firstly, an innovation enhancing organizational culture encourages employee initiative, inclusion in decision making and professional development. These findings are in line with those of Çakar and Ertürk (2010), Laforet (2016), and Shahzad and Shahbaz (2017) suggesting that a culture focusing on employee empowerment, involvement and commitment to training benefits enterprise innovativeness. Secondly, an innovation enhancing organizational culture is result-oriented, where everyone's performance is evaluated against the aims. This supports the notion that outcome and performance orientation facilitate innovation (Anderson and West, 1998; House et al., 2002; Brettel et al., 2014; Moonen, 2017). Thirdly, an innovation enhancing organizational culture is forward-looking, where long-term, strategic planning takes place. The link between long-term business orientation and enterprise innovativeness has been confirmed by several studies (Hofstede et al., 2010 and Laforet, 2016 amongst them), while Wang et al. (2007) concluded that SMEs frequently lack long-term planning and that negatively affects their business performance.

The study assessed implications of management trust to employees, cooperation between employees and business ethics. It was statistically significantly linked to introduction of organizational innovation in medium sized enterprises (Pearson correlation 0.417, statistically significant at the 0.01 level, 2 tailed), the link was weaker for small enterprises (Pearson correlation 0.137, statistically significant at the 0.05 level, 2 tailed), and not related to introduction of organizational innovation in micro-enterprises. Laforet (2016) came to similar findings that a climate of trust and open communication did not lead to higher organizational innovation performance in family businesses. A possible explanation could be that high levels of trust and cooperation are both - prerequisites for innovative climate in larger organizations, and also indicators of a closed business culture not favorable to innovation in smaller organizations. Further research could help to better explain this phenomenon.

The results also indicate that knowledge creation through creative discussions, knowledge sharing, using knowledge in decision making process and strategic assessment of the available knowledge and identifying new learning needs have a positive impact on organizational innovation. These findings are in line with studies confirming that creativity contributes to innovation (Senge, 1990; Liu et al., 2017), knowledge sharing helps organizations to improve performance and gain a competitive advantage (Nonaka, 1994; Reid, 2003; Oyemomi et al., 2019)

and that knowledge assessment and updating helps innovation allowing businesses to align with external environment changes (Jaworski and Kohli, 1993; Crossan et al. 1999).

The doctoral thesis supports previous findings (Armbruster et al., 2008; Mol and Birkinshaw, 2009; Gunday et al., 2011; Camisón and Villar-López, 2014; Arranz et al., 2019) that organizational innovation has a positive impact on enterprise performance and innovativeness - senior managers of the surveyed enterprises that had implemented organizational innovation generally agreed that it helped them to introduce other innovations, such as new products, services or marketing methods and to increase their competitiveness.

The research results were discussed with Latvian managers during a dedicated enterprise seminar on how organizational culture can foster organizational innovation. The participating managers agreed with the importance of an open, inclusive leadership that encourages employee participation in innovative enterprises. They suggested organizational culture as an integral part of a business approach towards quality. The managers suggested an internal job shadowing to foster internal knowledge transfer process and increase awareness of the value each employee adds to the enterprise. They considered the value of creative discussions through informal brainstorming and networking opportunities between employees outside the casual business environment. They shared a knowledge creation method, where employees suggest better products and processes based on their personal experiences, perceived market needs and external environment, including products offered by the competition. The managers also argued that leaders should be open to innovative ideas, recognize and reward employees for those and for special contribution to the enterprise; they considered this as an essential tool to increasing employee motivation and participation.

Asked, about the main challenges to foster innovations in the Latvian SMEs, the managers highlighted implications of the external business environment – Latvia as a small market, possibly with less demand for innovations, especially in the regions. Meanwhile, they noted that many enterprises are exporting and facing a global competition. They argued that innovation requires change, at the same time employees prefer predictability and are frequently reluctant against change; the management challenge is to encourage change and provide support, making employees, especially the lower level workers, comfortable with it.

The Latvian managers also highlighted the importance of an open internal communication and emphasized the need of a commonly shared long-term vision and common understanding of the main aims and direction for further development. This doctoral thesis did not measure the commonly shared vision per se due to the study design. As it had just one respondent per organization, it would be hard to assess the degree, to which a vision is shared. Asking a senior manager, whether the organization has a commonly shared and understood vision would likely be

subject to the social desirability bias. Thus, the doctoral thesis considered long-term strategic planning as a more formal, institutionalized way to understand, whether the organization has a clear direction of its further development.

The research findings recommend SME managers to shape and promote organizational culture that encourages employee initiative, participation and provide opportunities for employee professional development, thus ensuring a greater commitment to organization and capturing more innovative opportunities. SME managers should also focus on organizational results and performance, recognize and reward employee contributions towards innovation, and engage the organization in long-term, strategic planning thus creating a shared understanding of where the organization is going and capture long-term innovative opportunities. Finally, SME managers should encourage open and creative discussions, exchange of ideas and knowledge to benefit from the knowledge that individual employees have, use the organizational knowledge in decision making and continuously check, whether the existing knowledge is still relevant in the rapidly changing external context and whether it should be reassessed and updated.

## Conclusions

Based on the conducted research, the author comes to the following main conclusions:

1. Introduction of organizational innovation - changes in business practices, workplace organization and external relations that are new or improved to the enterprise – is affected by multiple factors at different levels. Organizational culture and knowledge management are key organizational innovation drivers due to their impact on organizational strategies, decision making ways, internal interactions, skillsets, capabilities, resilience and efficiency.
2. Organizational culture as a set of shared assumptions, values, attitudes and behaviors can be assessed in many ways; however, analyzing just organizational values may overlook the difference between the declared and the enacted values. Therefore, it is essential to assess organizational culture through behavior.
3. A cross-sectional study of over 600 SMEs in Latvia shows an organizational culture characterized by cooperation and trust, less by an inclusive decision making, initiative and long-term strategic planning. Meanwhile, knowledge sharing is on average the most common, while creative discussions – on average the least common knowledge management process in Latvian SMEs.
4. The empirical study finds outsourcing the most common organizational innovation form in Latvian SMEs, followed by quality management systems and external cooperation, while cross-functional teamwork was on average less used.
5. Several enterprise factors affect the introduction of organizational innovation - the more employees and larger the turnover, the more innovative an enterprise. Additionally, enterprises located in Riga and those with significant foreign investment are more innovative. The types of innovation vary across industries - manufacturing enterprises are more likely to introduce quality management systems, construction enterprises - teamwork and outsourcing, while trade enterprises are generally less likely to innovate.
6. The literature review and the empirical research clearly demonstrate that organizational culture and knowledge management processes enhance introduction of organizational innovation in SMEs, confirming the first thesis for defense and the **hypothesis** of the doctoral thesis - the more a SME is characterized by an innovation enhancing organizational culture and knowledge management processes, the higher the likelihood of introducing organizational innovation.
7. Thus, SME managers can foster innovation, shaping and developing an innovation enhancing organizational culture and knowledge management, which may not require

significant financial investments, at the same time contribute to enterprise innovativeness and competitiveness.

8. Employee professional development, initiative, performance evaluation, involvement in decision making and long-term strategic planning are the main aspects of organizational culture related to organizational innovation, while creative discussions, knowledge sharing, application in decision making, and strategic assessment - the main knowledge management processes related to organizational innovation.

Thus, the first and the second research questions are answered.

9. Although trust and cooperation significantly affect organizational innovation in medium-sized enterprises, such a relation was not observed in small and micro-enterprises.
10. Professional development, long-term strategic planning, knowledge sharing and application in decision making statistically significantly differ in micro, small and medium-sized enterprises.

Thus, the third research question is answered.

11. Strategic planning explains OI introduction in all industries, but the impact of other organizational culture and knowledge management varies between enterprises in different industries – knowledge creation and sharing, and performance evaluation explain OI introduction in manufacturing and construction enterprises, professional development and knowledge updating - in trade enterprises, and knowledge creation and sharing - in service enterprises.

Thus, the second thesis for defense is confirmed, and the fourth research question answered.

12. Results of the multiple linear regression analysis indicate that organizational culture, knowledge management and enterprise factors explain from 31% till 46.4% variability of the OI introduction measure in SMEs, depending on the industry.

Thus, the fifth research question is answered.

13. Enterprise managers considered organizational innovation beneficial for enterprise innovativeness and competitiveness; the more an enterprise had introduced organizational innovation, the more beneficial the surveyed managers found it

Thus, the third thesis for defense is confirmed.

## Recommendations and suggestions

Based on the conclusions of the doctoral thesis, the author gives the following suggestions.

### **Suggestions for further research in the management science:**

- assess, to what extent SME leaders purposefully develop and strengthen certain aspects of organizational culture to foster innovation;
- further examine the dynamics between the number of employees and their engagement in micro, small and medium-sized enterprises; and to what extent SME senior managers find employee commitment essential to support innovation;
- further assess the role of trust and employee cooperation in innovation processes of micro and small enterprises;
- investigate the impact of organizational culture and knowledge management processes in various cycles of organizational innovation, assessing, whether certain factors have more influence to start innovation, while others to ensure that it is fully implemented;
- compare the impact of organizational culture and knowledge management on organizational innovation introduction in SMEs internationally.

### **Recommendations to senior managers, leaders and business practitioners in SMEs**

- consider organizational innovation as one of the ways to enhance business competitiveness and innovativeness;
- create a culture promoting employee initiative, participation and providing opportunities for enabling professional growth, focusing on results and performance;
- recognize employee contribution to innovation;
- shape and promote an innovation enhancing organizational culture, not just through declared visions and values, but through enacted behaviors shared throughout the organization;
- engage in long-term strategic planning and include employees from various functions in it as much as possible, thus creating a shared understanding of where the organization is going, its objectives and long-term innovative capabilities;
- promote open and creative discussions, exchange of ideas and knowledge, to take advantage of the organization's knowledge in decision making and to regularly assess, whether the existing knowledge is still relevant in light of the rapidly changing external environment.

## References

- Acs, Z. J. & Audretsch, D. B. (1988). Innovation in large and small firms: an empirical analysis. *The American economic review*, 678-690.
- Agarwal, U.A. (2014). Examining the impact of social exchange relationships on innovative work behavior. *Team Performance Management: An International Journal*, 20(3/4), 102-120
- Aktas, M. Gelfand, M.J., & Hanges, P.J. (2015). Cultural tightness-looseness and perceptions of effective leadership, *Journal of Cross-Cultural Psychology*, 47(2), 294-309
- Ali Taha, V., Sirkova, M., & Ferencova, M. (2016). The impact of organizational culture on creativity and innovation. *Polish Journal of Management Studies*, 14, 7-17.  
10.17512/pjms.2016.14.1.01.
- Alofan, F., Chen, S., & Tan, H. (2020). National cultural distance, organizational culture, and adaptation of management innovations in foreign subsidiaries: A fuzzy set analysis of TQM implementation in Saudi Arabia. *Journal of Business Research*, 109, 184-199.
- Alvarez, C. & Urbano, D. (2012). Cultural-cognitive Dimension and Entrepreneurial Activity: A Cross-country Study. *Revista de Estudios Sociales*, 44, 146-157. 10.7440/res44.2012.14.
- Amabile, T.M. (1988). A model of creativity and innovation in organizations. *Research in Organizational Behaviour*, 10(1), 123-167.
- Anderson, N. R., & West, M. A. (1998). Measuring climate for work group innovation: development and validation of the team climate inventory, *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior*, 19(3), 235-258.
- Apsalone M., Dukeov I., Baumane-Vitolina I., Sumilo E., & Berke-Berga A. (2017). The impact of knowledge management, learning and socio-cultural factors on Innovation. *New Challenges of Economic and Business Development – 2017: Digital Economy. Riga, Latvia*. [Online] Available at:  
[https://www.bvef.lu.lv/fileadmin/user\\_upload/lu\\_portal/projekti/bvef/konferences/evf\\_conf2017/Proceedings.pdf](https://www.bvef.lu.lv/fileadmin/user_upload/lu_portal/projekti/bvef/konferences/evf_conf2017/Proceedings.pdf). [Accessed 15 January 2019].
- Apsalone, M. & Flores, R. M. (2018). Ethical Behavior and Organizational Innovation: Analysis of Small and Medium-sized Enterprises in Latvia. *Economics and Business*, 32 (1), 183-184
- Aravind, D., Damanpour, F., & Devece, C. (2014). Environmental performance: Interplay between the roles of process innovation capability and managerial innovation implementation. In Hervás-Oliver, J.-L., and Peris-Ortiz M. (eds.), *Management Innovation* (pp. 29-43). Springer, Cham.
- Argyris, C. & Schön, D. (1974) *Theory in practice: Increasing professional effectiveness*, San Francisco: Jossey-Bass, 260
- Argyris, C. & Schön, D. (1978). *Organizational learning: a theory of action perspective*. Addison-Wesley Pub. Co, 356
- Argyris, C. & Schön, D.A. (1992), *On Organizational Learning*, Blackwell, Cambridge, MA, 480



- Armbruster-Domeyer, H., Bikfalvi, A., Kinkel, S., & Gunter, L. (2008). Organizational Innovation: The Challenge of Measuring Non-Technical Innovation in Large-Scale Surveys. *Technovation*, 28, 644-657. 10.1016/j.technovation.2008.03.003.
- Arranz, N., Arroyabe, M. F., Li, J., & de Arroyabe, J. F. (2019). An integrated model of organisational innovation and firm performance: Generation, persistence and complementarity. *Journal of Business Research*, 105, 270-282.
- Azar, G. & Ciabuschi, F. (2017). Organizational innovation, technological innovation, and export performance: The effects of innovation radicalness and extensiveness. *International Business Review*, 26(2), 324-336.
- Baer, M. & Frese, M. (2003). Innovation is not enough: Climates for initiative and psychological safety, process innovations, and firm performance. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior*, 24(1), 45-68.
- Baker, W.E. & Sinkula, J.M. (1999). The synergistic effect of market orientation and learning orientation on organizational performance. *Journal of the Academy of Marketing Science*, 27 (4), 411-27.
- Barbaroux, P. (2012). Identifying Collaborative Innovation Capabilities Within Knowledge-Intensive Environments: Insights from the ARPANET Project. *European Journal of Innovation Management*, 15 (2): 232–258.
- Baregheh A., Rowley J., & Sambrook S. (2009). Towards a multidisciplinary definition of innovation, *Management Decision*, 47(8), 1323-1339, <https://doi.org/10.1108/00251740910984578>
- Becerra-Fernandez, I., & Sabherwal, R. (2010). *Knowledge Management: Systems and Processes*. Armonk (N.Y.), London: M.E. Sharpe, 352
- Becheikh, N., Landry, R., & Amara, N. (2006). Lessons from Innovation Empirical Studies in the Manufacturing Sector: A Systematic Review of the Literature from 1993–2003. *Technovation*, 26(5-6), 644-664.
- Bennett, N. & Lemoine, G. J. (2014). What a difference a word makes: Understanding threats to performance in a VUCA world. *Business Horizons*, 57(3), 311-317.
- Bessant, J., Lamming, R., Noke, H., & Phillips, W. (2005) Managing Innovation Beyond the Steady State. *Technovation*. 25. 1366-1376. 10.1016/j.technovation.2005.04.007.
- Bik, O. P. G. (2010). The behavior of assurance professionals: A cross-cultural perspective. *Eburon Uitgeverij BV*, 214
- Birkinshaw, J., Hamel, G., & Mol, M. J. (2008). Management Innovation. *Academy of Management Review*, 33, 825-845.
- Bluedorn, A.C. (2002). *The Human Organization of Time: Temporal Realities and Experience*. Stanford University Press, 367
- Bodlaj, M., Kadic-Maglajlic, S., & Vida, I. (2018). Disentangling the impact of different innovation types, financial constraints and geographic diversification on SMEs' export growth. *Journal of Business Research*, 1-10

- Boer, H. (2001). Innovation, What Innovation? A Comparison between product, process and organizational innovation. *International Journal of Technology Management*, 22, 83-107.
- Boisot, H. (2010), *Knowledge Assets*, Oxford University Press, New York, NY, 312
- Bortolotti, T., Boscari, S., & Danese, P. (2015). Successful lean implementation: Organizational culture and soft lean practices. *International Journal of Production Economics*, 160, 182-201.
- Bower, J. L., & Christensen, C. M. (1995). Disruptive technologies: catching the wave, *Harvard Business Review*, 1, 43-53
- Brettel, M., Chomik, C. & Flatten, T. C. (2014). How Organizational Culture Influences Innovativeness, Proactiveness, and Risk-Taking: Fostering Entrepreneurial Orientation in SMEs. *Journal of Small Business Management*, 53: 868-885. doi:10.1111/jsbm.12108
- Brouwer, M. (2000). Entrepreneurship and Uncertainty: Innovation and Competition among the Many, *Small Business Economics*, 15(2), 149. Retrieved from <http://www.jstor.org/stable/40229102>
- Budros, A. (2000). Organizational types and organizational innovation: Downsizing among industrial, financial, and utility firms. *In Sociological Forum* 15 (2), Kluwer Academic Publishers-Plenum Publishers, 273-306.
- Burns, T. & Stalker, GM. (1961). *The Management of Innovation*. Tavistock Publications, London, 269
- Çakar, N. D. & Ertürk, A. (2010). Comparing innovation capability of small and medium-sized enterprises: examining the effects of organizational culture and empowerment. *Journal of Small Business Management*, 48(3), 325-359.
- Camisón, C. & Villar-López, A. (2014). Organizational innovation as an enabler of technological innovation capabilities and firm performance. *Journal of Business Research*, 67(1), 2891-2902.
- Carneiro, A. (2000). How does knowledge management influence innovation and competitiveness? *Journal of knowledge management*, 4(2), pp. 87-98
- Caroli, E., & Van Reenen, J. (2001). Skill biased organizational change? Evidence from a panel of British and French establishments. *The Quarterly Journal of Economics* 116 (4), 1149–1192.
- Cavusgil, S. T., Calantone, R. J., & Zhao, Y. (2003). Tacit knowledge transfer and firm innovation capability. *The Journal of Business and Industrial Marketing*, 18(1), 6-21.
- Central Statistical Bureau of Latvia, Number and share of innovation-active enterprises - <https://www.csb.gov.lv/en/statistics/statistics-by-theme/enterprises/innovaton/tables/ing051/number-and-share-innovation-active-enterprises-nace> (Accessed 20.10.2019)
- Černe, M., Kaše, R., & Škerlavaj, M. (2016). Non-technological innovation research: evaluating the intellectual structure and prospects of an emerging field. *Scandinavian Journal of Management*, 32(2), 69-85.
- Chandler, A.D. (1962) *Strategy and Structure: Chapters in the History of the American Industrial Enterprise*. Cambridge, M.A.: MIT Press.

- Chandler, G. N., Keller, C., & Lyon, D. W. (2000). Unraveling the determinants and consequences of an innovation-supportive organizational culture. *Entrepreneurship theory and practice*, 25(1), 59-76.
- Chaston, I., Badger, B., Mangles, T., & Sadler-Smith, E. (2001). Organisational learning style, competencies and learning systems in small, UK manufacturing firms, *International Journal of Operations & Production Management*, 21 (11), 1417-1432.
- Chatman, J. A., & Jehn, K. A. (1994). Assessing the relationship between industry characteristics and organizational culture: how different can you be? *Academy of Management Journal*, 37(3), 522-553.
- Chatzoudes, D., Chatzoglou, P., & Vraimaki, E. (2015). The central role of knowledge management in business operations: Developing a new conceptual framework. *Business Process Management Journal*. 21. 1117-1139. 10.1108/BPMJ-10-2014-0099.
- Chen, J., Zhaohui, Z. & Xie, H.Y. (2004). Measuring intellectual capital, *Journal of Intellectual Capital*, 5(1), 195-212.
- Chesbrough, H. (2003). *Open Innovation: The New Imperative for Creating and Profiting from Technology*, Harvard Business School Press, Boston.
- Chesbrough, H., & Bogers, M. (2014). Explicating open innovation: Clarifying an emerging paradigm for understanding innovation. In H. Chesbrough, W. Vanhaverbeke, and J. West (Eds.), *New Frontiers in Open Innovation*: 3-28. Oxford: Oxford University Press, 368
- Cirera, X., & Muzi, S. (2016). Measuring Firm-Level Innovation Using Short Questionnaires: Evidence from an Experiment. World Bank Policy Research Working Paper No. 7696. Retrieved from - <https://www.oecd.org/sti/044%20-%20WPS7696.pdf>
- Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35(1), 128-152.
- Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (Text with EEA relevance), retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32003H0361>
- Cooke, R.A. & Szumal, J.L. (2000). *Handbook of Organizational Culture and Climate*, Sage Publications, 147-162.
- Corazza, G. E. (2016). Potential Originality and Effectiveness: The Dynamic Definition of Creativity, *Creativity Research Journal*, 28:3, 258-267
- Coriat, B. (2001). Organizational innovation in European firms: a critical overview of the survey evidence. In: Archibugi, D., Lundvall, B. (Eds.), *The Globalizing Learning Economy*. Oxford University Press, Oxford, New York, 195–219.
- Crossan, M.M., Lane, H.W., & White, R.E. (1999), An organizational learning framework: from intuition to institution, *Academy of Management Review*, 24 (3), 522-537.
- Dahlander, L. & D. Gann (2010), How open is open innovation?, *Research Policy*, 39(6), 699-709.
- Damanpour F. & Evan W. M. (1984). Organizational Innovation and Performance: The Problem of Organizational Lag, *Admin. Sci. Quarterly*, 29, 392-409

- Damanpour, F., Szabat, K. A., & Evan, W. M. (1989). The relationship between types of innovation and organizational performance. *Journal of Management Studies*, 26(6), 587-602.
- Damanpour, F. (1991). Organizational Innovation: A Meta-Analysis of Effects of Determinants and Moderators. *The Academy of Management Journal*, 34(3), 555-590
- Damanpour, F. (1996). Organizational Complexity and Innovation: Developing and Testing Multiple Contingency Models. *Management Science*, 42(5), 693-716. Retrieved from <http://www.jstor.org/stable/2634460>
- Damanpour, F. & Aravind, D. (2012). Managerial Innovation: Conceptions, Processes, and Antecedents. *Management and Organization Review*, 8, 423-454.
- Damanpour, F. (2014). Footnotes to research on management innovation. *Organization Studies*, 35(9), 1265-1285.
- Damanpour, F., Sanchez-Henriquez, F., & Chiu, H. H. (2018). Internal and external sources and the adoption of innovations in organizations. *British Journal of Management*, 29(4), 712-730.
- Dauber, D., Fink, G., & Yolles, M. (2012). A configuration model of organizational culture. *Sage Open*, 2(1), <https://doi.org/10.1177/2158244012441482>
- Davenport, T. H., & Prusak, L. (1998). *Working knowledge: How organizations manage what they know*. Harvard Business Press, 199
- Day, G.S. (1994), The capabilities of market-driven organizations, *Journal of Marketing*, 58 (4), 37-52.
- De Jong, J.P.J. (2016). Entrepreneurial Behavior by Employees in Organizations. SSRN - [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2721615](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2721615) [Accessed on 27.10.2019]
- De Long, D. W., & Fahey, L. (2000). Diagnosing cultural barriers to knowledge management. *Academy of Management Perspectives*, 14(4), 113-127.
- De Spiegelaere, S., Van Gyes, G., & Van Hootegem, G. (2014). The Innovative Work Behaviour concept: definition and orientation, *Gedrag & Organisatie*, 27(2), 139-156.
- Deal, T.E. & Kennedy, A.A. (1982) *Corporate Cultures: The Rites and Rituals of Corporate Life*. Addison Wesley Publishing Company, Reading, 126.
- Denison, D. R., & Spreitzer, G. M. (1991). Organizational culture and organizational development: A competing values approach. *Research in organizational change and development*, 5(1), 1-21.
- Denison, D. R. (1996). What is the difference between organizational culture and organizational climate? A native's point of view on a decade of paradigm wars. *Academy of management review*, 21(3), 619-654.
- Doheny, M., Nagali, V., & Weig, F. (2012). Agile operations for volatile times. *McKinsey Quarterly*. Retrieved from [http://www.mckinsey.com/insights/operations/agile\\_operations\\_for\\_volatile\\_times](http://www.mckinsey.com/insights/operations/agile_operations_for_volatile_times)
- Dosi, G., Freeman, C., Nelson, R., Silverberg, G., & Soete, L. (1988). *Technical change and economic theory*. Pinter Publishers Limited, London, 646

- Dowton, S. B. (2005). Imperatives in medical education and training in response to demands for a sustainable workforce. *Medical Journal of Australia*, 183(11-12), 595-598.
- Drucker P.F. (1985). *Innovation and Entrepreneurship*. R: Butterworth & Heinemann, London, 293
- Du Plessis, M. (2007). The role of knowledge management in innovation. *Journal of knowledge management*, 11(4), 20-29, <https://doi.org/10.1108/13673270710762684>
- Dubinskas, F.A. (1988). *Making Time: Ethnographies of High-technology Organizations*. Philadelphia: Temple University Press, 232
- Ellonen, R., Blomqvist, K., & Puumalainen, K. (2008). The role of trust in organisational innovativeness, *European Journal of Innovation Management*, 11(2), 160-181.
- Enkel, E. (2010). Attributes required for profiting from open innovation in networks, *International Journal of Technology Management*, 52(3/4), 344-371.
- Ettlie, J. E., & Reza, E. M. (1992). Organizational integration and process innovation. *Academy of Management Journal*, 35(4), 795-827.
- Etzioni, A. (1975). *A Comparative Analysis of Complex Organizations. On Power, Involvement, and Their Correlates*. 2nd ed. New York: The Free Press, 584
- Eurostat, the Community Innovation Survey data (CIS 2016), <https://ec.europa.eu/eurostat/web/science-technology-innovation/data/database> (Accessed 20.10.2019)
- Evan, W. M., & Black, G. (1967). Innovation in business organizations: some factors associated with success or failure of staff proposals. *The Journal of Business*, 40(4), 519-530.
- Evangelista, R., & Vezzani, A. (2010). The economic impact of technological and organizational innovations: A firm level analysis. *Research Policy*, 39, 1253–1263.
- Fernandes Rodrigues Alves, M., Vasconcelos Ribeiro Galina, S., & Dobelin, S. (2018). Literature on organizational innovation: past and future. *Innovation & Management Review*, 15(1), 2-19.
- Field, A. (2018). *Discovering Statistics Using IBM SPSS Statistics*. London: SAGE Publications Ltd, 1375
- Freeman, C. & Soete, L. (1997). *The economics of industrial innovation*. The M.I.T. Press, 3<sup>rd</sup> edition, 470
- Gallego, J., Rubalcaba, L., & Hipp, C. (2013). Organizational innovation in small European firms: A multidimensional approach. *International Small Business Journal*, 31(5), 563-579.
- Garvin, D.A. (1993). Building a Learning Organization. *Harvard Business Review* (7-8), retrieved from - <https://hbr.org/1993/07/building-a-learning-organization>
- Girard, J. & Girard, J. (2015). Defining knowledge management: Toward an applied compendium. *Online Journal of Applied Knowledge Management*, 3(1), 1-20.
- Glynn, M. A. (1996). Innovative genius: A framework for relating individual and organizational intelligences to innovation. *Academy of management review*, 21(4), 1081-1111.

- Goffee, R., & Jones, G. (1998). *The Character of a Corporation: How Your Company's Culture Can Make or Break Your Business*. London: Harper Collins Business, 237
- Goran, J, Srinivasan, R., & LaBerge, L. (2017). Culture for a Digital Age, *McKinsey Quarterly*, July. <https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/culture-for-a-digital-age>
- Grant, R. (1996). Toward A Knowledge-Based Theory of the Firm. *Strategic Management Journal*, 17, 109-122. 10.1002/smj.4250171110.
- Griese, I, Pick, D. & Kleinaltenkamp, M. (2012). Antecedents of Knowledge Generation Competence and its Impact on Innovativeness. *Journal of Business & Industrial Marketing*, 27 (6), 468 - 485.
- Grigoriou, K. & Rothaermel, F. T. (2017). Organizing for knowledge generation: Internal knowledge networks and the contingent effect of external knowledge sourcing, *Strategic Management Journal*, 38(2), 395-414.
- Groysberg, B., Lee, J., Price, J. & Cheng, J. Y.-J. (2018), The Leaders Guide to Corporate Culture, *Harvard Business Review*, <https://hbr.org/product/the-leaders-guide-to-corporate-culture/R1801B-PDF-ENG>
- Gunday, G., Ulusoy, G., Kilic, K. & Alpkan, L. (2011). Effects of innovation types on firm performance. *International Journal of Production Economics*. 133. 662-676. 10.1016/j.ijpe.2011.05.014.
- Gupta, V. (2011). Cultural basis of high performance organizations, *International Journal of Commerce and Management*, 21(3), 221-240. <https://doi.org/10.1108/10569211111165280>
- Hamel, G. (2006). The why, what, and how of management innovation. *Harvard Business Review*, 84(2), 72.
- Handy, C. B. (1993). *Understanding organizations*. New York, NY: Oxford University Press, 445
- Harkins, A.M. & Moravec, J. W. (2011). Systemic approaches to knowledge development and application, *On the Horizon*, 19 (2), 127-133, <https://doi.org/10.1108/10748121111138326>
- Harrison R. (1972). Understanding your organization's character, *Harvard Business Review*, 50 (3), 119–128.
- Harvard Business Review Analytic Services (2019). Innovation Ecosystems: How to Foster Business Success. Retrieved from <https://hbr.org/sponsored/2019/08/innovation-ecosystems-how-to-foster-business-success> on 20.10.2019.
- Henderson, T. (2017). Why Innovation Is Crucial to Your Organization's Long-Term Success, *Forbes Coaches Council Post*, Retrieved from <https://www.forbes.com/sites/forbescoachescouncil/2017/05/08/why-innovation-is-crucial-to-your-organizations-long-term-success/#4d82872b3098>
- Hills, M. D. (2002). Kluckhohn and Strodtbeck's Values Orientation Theory. *Online Readings in Psychology and Culture*, 4(4).<https://doi.org/10.9707/2307-0919.1040>
- Hofstede, G. (1980). *Culture's Consequences: International Differences in Work Related Values*, Sage Publications, Beverly Hills, CA, 327

- Hofstede, G., Hofstede, G. J., & Minkov, M. (2010). *Cultures and Organizations: Software of the Mind*. Revised and expanded 3rd Edition. N.-Y.: McGraw-Hill, 561
- Homburg, C. & Pflesser, C. (2000). A multiple-layer model of market-oriented organizational culture: Measurement issues and performance outcomes. *Journal of marketing research*, 37(4), 449-462.
- Hong, P., Doll, W.J., Nahm, A.Y. & Li, X. (2004). Knowledge sharing in integrated product development, *European Journal of Innovation Management*, 7(2), 102-12.
- House, R., Javidan, M., Hanges, P. & Dorfman, P. (2002). Understanding Cultures and Implicit Leadership Theories Across the Globe: An Introduction to Project GLOBE, *Journal of World Business*, 37, 3-10. 10.1016/S1090-9516(01)00069-4.
- House, R. J., Hanges, P. J., Javidan, M., Dorfman, P. W., & Gupta, V. (Eds.). (2004). *Culture, leadership, and organizations: The GLOBE study of 62 societies*. Sage publications, 848
- Hsieh, N. H., Lange, B., Rodin, D., & Wolf-Bauwens, M. L. (2018). Getting clear on corporate culture: conceptualisation, measurement and operationalisation. *Journal of the British Academy*, 6(s1), 155-184.
- Hughes, M., & Morgan, R. E. (2007). Deconstructing the relationship between entrepreneurial orientation and business performance at the embryonic stage of firm growth. *Industrial marketing management*, 36(5), 651-661.
- Hunter, S.T., Bedell, K.E., & Mumford, M.D. (2007). Climate for creativity: A quantitative review. *Creativity Research Journal*, 19, 69-90.
- Imran, R., Saeed, T., Anis-Ul-Haq, M., & Fatima, A. (2010). Organizational climate as a predictor of innovative work behavior. *African Journal of Business Management*, 4(15), 3337.
- Jalonen, H. (2012). The uncertainty of innovation: a systematic review of the literature. *Journal of Management Research*, 4(1), 1.
- Javidan, M., House, R. J., Dorfman, P. W., Hanges, P. J., & De Luque, M. S. (2006). Conceptualizing and measuring cultures and their consequences: a comparative review of GLOBE's and Hofstede's approaches. *Journal of International Business Studies*, 37(6), 897-914.
- Jaworski, B.J., & Kohli, A.K. (1993). Market Orientation: Antecedents and Consequences. *Journal of Marketing*, 57(3), 53-70. doi:10.2307/1251854
- Jaworski, B.J., Kohli, A. K., & Sahay, A. (2000). Market-driven versus driving markets. *Journal of the Academy of Marketing Science*, 28(1), 45–54.
- Johnson, M., C. Christensen, & H. Kagermann (2008). Reinventing your business model, *Harvard Business Review*, <https://hbr.org/product/reinventing-your-business-model/an/R0812C-PDF-ENG>.
- Kahn, K. B. (2018). Understanding innovation. *Business Horizons*, 61(3), 453-460.
- Kenny, B. & Reedy, E. (2006). The Impact of Organisational Culture Factors on Innovation Levels in SMEs: An Empirical Investigation. *Irish Journal of Management*, 27(2).

- Khazanchi, S., Lewis, M. W., & Boyer, K. K. (2007). Innovation-supportive culture: The impact of organizational values on process innovation. *Journal of operations management*, 25(4), 871-884.
- Khosravi, P., Newton, C., & Rezvani, A. (2019). Management innovation: A systematic review and meta-analysis of past decades of research. *European Management Journal*, 1-14
- Kimberly, J. R., & Evanisko, M. J. (1981). Organizational innovation: The influence of individual, organizational, and contextual factors on hospital adoption of technological and administrative innovations. *Academy of Management Journal*, 24(4), 689-713.
- Kimberly, J.R. (1981). Managerial innovation, in Nystrom, P.C. and Starbuck, W.H. (Eds), *Handbook of Organizational Design*, Oxford University Press, Oxford.
- King, W.R. (2007). A research agenda for the relationships between culture and knowledge management, *Knowledge and process management*, 14 (3), 226-236
- Kirzner, I.M. (1973). *Competition and Entrepreneurship*, Chicago: University of Chicago Press, 246
- Kondratiuk-Nierodzińska, M. (2016). Innovation capabilities in EU countries: have Central and Eastern European countries been catching up? *Journal of Business Economics and Management*, 17(5), 765-779.
- Kroeber, A. L., & Kluckhohn, C. (1952). Culture: A critical review of concepts and definitions. *Papers. Peabody Museum of Archaeology & Ethnology, Harvard University*.
- Laforet, S. (2016). Effects of organisational culture on organisational innovation performance in family firms. *Journal of Small Business and Enterprise Development*, 23(2), 379-407.
- Lam, A. (2005). Organizational innovation. In: Fagerberg, J., Mowery, D.C., Nelson, R.R. (Eds.), *The Oxford Handbook of Innovation*. Oxford University Press, Oxford, 115–147.
- Lam, A. (2010). Innovative organizations: structure, learning and adaptation. *Innovation Perspectives for the 21st Century*, Madrid: BBVA, Spain, 163-175.
- Lawrence, P.R. & Lorsch, J.W. (1967). Differentiation and Integration in Complex Organizations. *Administrative Science Quarterly*, 12:1-47.
- Lhuillery, S., Raffo, J., & Hamdan-Livramento, I. (2017). Measurement of innovation. In *The Elgar Companion to Innovation and Knowledge Creation*. Edward Elgar Publishing.
- Liu D., Gong Y., Zhou J., Huang J.-C. (2017). Human resource systems, employee creativity, and firm innovation: the moderating role of Firm ownership. *Academy of Management Journal*, 60(3), 1164–1188.
- Losane, L. (2013). Innovation Culture–Determinant of Firms’ Sustainability. *International Journal of Social, Education, Economics and Management Engineering*, 7(10), 1483-1488.
- Louis, M. R. (1980). Surprise and sense making: What newcomers experience in entering unfamiliar organizational settings. *Administrative Science Quarterly*, 226-251.
- Madrid-Guijarro, A., Garcia, D., & Van Auken, H. (2009). Barriers to innovation among Spanish manufacturing SMEs. *Journal of Small Business Management*, 47(4), 465-488.
- Martin, J. (2002) *Organizational culture: Mapping the Terrain*. Thousand Oaks. CA: Sage, 402



- Maruyama, M. (1974). Paradigmatology and its Application to Cross-Disciplinary, Cross-Professional and Cross-Cultural Communication. *Dialectica*, 28(3/4), 135-196. Retrieved from <http://www.jstor.org/stable/42971411>
- Matthews, R. L., MacCarthy, B. L., & Braziotis, C. (2017). Organisational learning in SMEs: a process improvement perspective. *International Journal of Operations & Production Management*, 37(7), 970-1006
- McCabe, D. (2002). Waiting for dead men's shoes: towards a cultural understanding of management innovation. *Human Relations*, 55(5), 505-536.
- Merono-Cerdan, A. L., & López-Nicolas, C. (2013). Understanding the drivers of organizational innovations. *The Service Industries Journal*, 33(13-14), 1312-1325.
- Merono-Cerdan, A. L. & López-Nicolás, C. (2017). Innovation objectives as determinants of organizational innovations. *Innovation*. 19. 208 - 226. 10.1080/14479338.2016.1276407.
- Mezias, S.J. & Glynn, M.A. (1993). The Three Faces of Corporate Renewal: Institution, Revolution, and Evolution. *Strategic Management Journal*, 14: 77-101.
- Mintzberg, H. (1979), *The Structuring of Organizations*, Pearson, 509
- Mintzberg, H. (2007), *Mintzberg on Management*, Free Press, 420
- Mol, M. J., & Birkinshaw, J. (2009). The sources of management innovation: When firms introduce new management practices. *Journal of business research*, 62(12), 1269-1280.
- Moonen, P. (2017). The impact of culture on the innovative strength of nations: A comprehensive review of the theories of Hofstede, Schwartz, Boisot and Cameron and Quinn. *Journal of Organizational Change Management*. 30. 00-00. 10.1108/JOCM-08-2017-0311.
- Morris, M., Davis, D., & Allen, J. (1994). Fostering Corporate Entrepreneurship: Cross-Cultural Comparisons of the Importance of Individualism versus Collectivism. *Journal of International Business Studies*, 25(1), 65-89. Retrieved from <http://www.jstor.org/stable/154852>
- Naylor, J. B., Naim, M. M., & Berry, D. (1999). Leagility: Integrating the lean and agile manufacturing paradigms in the total supply chain. *Int. J. Production Economics*, 62(107), 118.
- Nohria, N. & Gulati, R. (1996). Is Slack Good or Bad for Innovation? *The Academy of Management Journal*, 39(5), 1245-1264
- Nonaka, I. (1994). A Dynamic Theory of Organizational Knowledge Creation. *Organization Science*, 5(1), 14-37. Retrieved from <http://www.jstor.org/stable/2635068>
- Nonaka, I. and Takeuchi, H. (1995), *The Knowledge-Creating Company*, Oxford University Press, New York, NY.
- Nooteboom, B. (1994). Innovation and diffusion in small firms: theory and evidence. *Small business economics*, 6(5), 327-347.
- OECD (2019), OECD SME and Entrepreneurship Outlook 2019, OECD Publishing, Paris, 320 – <https://doi.org/10.1787/34907e9c-en>
- OECD-Eurostat (2005). Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data, 3rd Edition, The Measurement of Scientific and Technological Activities, OECD Publishing, Paris, <https://doi.org/10.1787/9789264013100-en>.

- OECD-Eurostat (2018), Oslo Manual 2018: Guidelines for Collecting, Reporting and Using Data on Innovation, 4th Edition, The Measurement of Scientific, Technological and Innovation Activities, OECD Publishing, Paris/Eurostat, Luxembourg, <https://doi.org/10.1787/9789264304604-en>
- Onken, M. (1999), Temporal elements of organizational culture and impact on firm performance, *Journal of Managerial Psychology*, 14(3/4), 231-244. <https://doi.org/10.1108/02683949910263756>
- Oyemomi, O., Liu, S., Neaga, I., Chen, H., & Nakpodia, F. (2019). How cultural impact on knowledge sharing contributes to organizational performance: Using the fsQCA approach. *Journal of Business Research*, 94, 313-319.
- Palermo, T. (2011). Managing organizational culture for effective internal control. From practice to theory. *The European Accounting Review*, 20(4), 771–774.
- Papa, A., Dezi, L., Gregori, G. L., Mueller, J., & Miglietta, N. (2018). Improving innovation performance through knowledge acquisition: the moderating role of employee retention and human resource management practices. *Journal of Knowledge Management*, 1-32
- Parsons, T., & Shils, E. A. (Eds.). (1951). *Toward a general theory of action*. Cambridge, MA Harvard University Press.
- Peñalver, M. J. P., Mas, L. E. A., & Fleta, B. M. (2018). Identification and classification of behavioural indicators to assess innovation competence. *Journal of Industrial Engineering and Management*, 11(1), 87-115.
- Peris-Ortiz, M., & Hervás-Oliver, J. L. (2014). Management innovation and technological innovation: friends or foes? In Hervás-Oliver, J.-L., and Peris-Ortiz M. (eds.), *Management Innovation* (pp. 1-17). Springer, Cham.
- Pettigrew, A.M & Fenton, E.M. (eds.). (2000). *The Innovating Organization*. London: Sage Publications.
- Pino, C., Felzensztein, C., Zwerg-Villegas, A. M., & Arias-Bolzmann, L. (2016). Non-technological innovations: Market performance of exporting firms in South America. *Journal of Business Research*, 69(10), 4385-4393.
- Porter, M.E. (1980). *Competitive Strategy: Techniques for Analyzing Industries and Competitors*, Free Press, New York, 397
- Porter, M. E. (2000). What Is Strategy? *Harvard Business Review*, 86(1), 2-22.
- Porter, M. E. (2008). The five competitive forces that shape strategy. *Harvard Business Review*, 86(1), 25-40.
- Prahalad, C.K. & Hamel, G. (1990). The core competence of the corporation. *Harvard Business Review*, 68(3), 79-91.
- Prange, C., & Pinho, J. C. (2017). How personal and organizational drivers impact on SME international performance: The mediating role of organizational innovation. *International Business Review*, 26(6), 1114-1123.

- Pullen, A., De Weerd-Nederhof, P., Groen, A., Song, M., & Fisscher, O. (2009). Successful patterns of internal SME characteristics leading to high overall innovation performance. *Creativity and Innovation Management*, 18(3), 209-223.
- Quinn, R. E., & Rohrbaugh, J. (1981). A competing values approach to organizational effectiveness. *Public Productivity Review*, 122-140.
- Quinn, R. E., & Rohrbaugh, J. (1983). A spatial model of effectiveness criteria: Towards a competing values approach to organizational analysis. *Management Science*, 29(3), 363-377.
- Reid, F. (2003), Creating a knowledge sharing culture among diverse business units, *Employment Relations Today*, 30 (3), 43-9.
- Rosenberg, N. & Kline, S. (1986). *An overview of innovation*. Landau and N. Rosenberg.
- Sadegh Sharifirad, M., & Ataei, V. (2012). Organizational culture and innovation culture: exploring the relationships between constructs. *Leadership & Organization Development Journal*, 33(5), 494-517.
- Sakowski K., Vadi, M. & Meriküll, J. (2019) Patterns of organisational innovation: comparison of western and eastern countries in Europe, *Innovation: The European Journal of Social Science Research*, 32:2, 270-290, DOI: 10.1080/13511610.2018.1467753
- Sapprasert, K. & Clausen, T.H. (2012) Organizational innovation and its effects. *Industrial and Corporate Change*, 21, 1283-1305.
- Schein, E. (2004). *Organizational culture and leadership* (3rd ed.). San Francisco, CA: Jossey-Bass, 437
- Schmidt, T., & Rammer, C. (2006). The determinants and effects of technological and non-technological innovations—Evidence from the German CIS IV. Zentrum für Europäische Wirtschaftsforschung, Mannheim. Retrieved from <http://www.oecd.org/sti/inno/37450197.pdf> (30.11.2019)
- Schneider, W. (2017). *Lead Right for Your Company's Type: How to Connect Your Culture with Your Customer Promise*. New York: Amacom, 200
- Scholz, C. (1987). Corporate culture and strategy—The problem of strategic fit. *Long Range Planning*, 20(4), 78-87.
- Schumpeter, J.A. (1934). *The Theory of Economic Development*. Harvard University Press, Cambridge, MA.
- Schumpeter, J.A. (1942). *Capitalism, Socialism and Democracy* (3rd edition), London: George Allen and Unwin, 1976
- Schwab, K. (2017). The fourth industrial revolution. *Rotman Management Magazine*, Fall 2016, 19-24
- Schwartz, H., & Davis, S. M. (1981). Matching corporate culture and business strategy. *Organizational Dynamics*, 10(1), 30-48.
- Scott, S.G., & Bruce, R.A. (1994). Determinants of innovative behavior: A path model of individual innovation in the workplace. *Academy of Management Journal*, 37(3), 580-607
- Senge, P. (1990). *The Fifth Discipline*, Doubleday, New York, NY, 412

- Shahzad, F., Xiu, G., & Shahbaz, M. (2017). Organizational culture and innovation performance in Pakistan's software industry. *Technology in Society*, 51, 66-73.
- Shane, S. (1994). Cultural Values and the Championing Process. *Entrepreneurship: Theory & Practice* 18(4), 25-41. <https://doi.org/10.1177/104225879401800402>
- Shane, S. (1995). Uncertainty Avoidance and the Preference for Innovation Championing Roles. *Journal of International Business Studies*, 26(1), 47-68. Retrieved from <http://www.jstor.org/stable/155477>
- Shanker, R., Bhanugopan, R., Van der Heijden, B. I., & Farrell, M. (2017). Organizational climate for innovation and organizational performance: The mediating effect of innovative work behavior. *Journal of vocational behavior*, 100, 67-77.
- Sinkula, J. (1994). Market Information Processing and Organizational Learning. *Journal of Marketing*, 58(1), 35-45. doi:10.2307/1252249
- Smith, M., Busi, M., Ball, P., & Van der Meer, R. (2008). Factors influencing an organisation's ability to manage innovation: a structured literature review and conceptual model. *International Journal of innovation management*, 12(04), 655-676.
- Souitaris, V. (2002). Technological Trajectories as Moderators of Firm-level Determinants of Innovation. *Research Policy*, 31, 877–898.
- Spicer, D.P. & Sadler-Smith, E. (2006). Organizational Learning in Smaller Manufacturing Firms. *International Small Business Journal*, 24(2), 133-58.
- Stathakoloulos, V. (1998). Enhancing the performance of marketing managers: aligning strategy, structure and evaluation systems. *European Journal of Marketing*, 32 (5/6), 536-58.
- Stock, R. M., Six, B., & Zacharias, N. A. (2013). Linking multiple layers of innovation-oriented corporate culture, product program innovativeness, and business performance: A contingency approach. *Journal of the Academy of Marketing Science*, 41(3), 283-299.
- Sundbo, J. (1998). *The theory of innovation: entrepreneurs, technology and strategy*. Edward Elgar Publishing, 232
- Tang, H. K. (1998). An integrative model of innovation in organizations. *Technovation*. 18(5), 301.
- Teece, D. J. (1998). Design issues for Innovative Firms: Bureaucracy, Incentives and Industrial Structure in A.D. Chandler, Jr., P. Hagstrom, and O. Solvell (eds.). *The Dynamic Firm*, Oxford: Oxford University Press.
- Teece, D., Peteraf, M., & Leih, S. (2016). Dynamic capabilities and organizational agility: Risk, uncertainty, and strategy in the innovation economy. *California Management Review*, 58(4), 13-35.
- Tether, B. S., & A. Tajar (2008). The Organisational-Cooperation Mode of Innovation and its Prominence Amongst European Service Firms, *Research Policy* 37 (4): 720–739.
- Thompson, V.A. (1965). Bureaucracy and innovation, *Administrative Science Quarterly*, 10, 1-20
- Throsby, C.D. (2001). *Economics and Culture*, Cambridge, Cambridge University Press, 208

- Tian, M., Deng, P., Zhang, Y., & Salmador, M. P. (2018). How does culture influence innovation? A systematic literature review. *Management Decision*, 56(5), 1088-1107.
- Tidd, J. & Bessant, J. (2009), *Managing innovation*. West Sussex: John Wiley & Sons Ltd., 230.
- Toner, P. (2011). Workforce skills and innovation – an overview of major themes in the literature. OECD STI Working Paper Series, Retrieved from - <https://www.oecd.org/sti/inno/46970941.pdf>
- Treviño, L. K., Butterfield, K. D., & McCabe, D. L. (1998). The ethical context in organizations: Influences on employee attitudes and behaviors. *Business Ethics Quarterly*, 8(3), 447-476.
- Trist, E. L., & Bamforth, K. W. (1951). Some social and psychological consequences of the longwall method of coal-getting: An examination of the psychological situation and defences of a work group in relation to the social structure and technological content of the work system. *Human relations*, 4(1), 3-38.
- Trompenaars, A. & Hampden-Turner, C. (1997). *Riding the waves of culture: Understanding cultural diversity in global business*. Nicholas Brealey Publishing.
- Tse, T.C.M. & Esposito, M. (2017), *Understanding How the Future Unfolds: Using DRIVE to Harness the Power of Today's Megatrends*, Lioncrest Publishing, 234
- Turró, A., Urbano, D. & Peris-Ortiz, M. (2014) Culture and Innovation: The Moderating Effect of Cultural Values on Corporate Entrepreneurship, *Technological Forecasting and Social Change*, 88, 360-369.
- Tushman, M.L. & O'Reilly, C.A. III (1996). Ambidextrous Organizations: Managing Evolutionary and Revolutionary Change, *California Management Review*, 38(4), 8-30.
- Tushman, M. L. (1997). Winning through innovation. *Strategy & Leadership*, 25(4), 14-19.
- Veugelers, R. (2016). The European Union's growing innovation divide (No. 2016/08). Bruegel Policy Contribution. Retrieved on 19.12.2019 from [https://bruegel.org/wp-content/uploads/2016/04/pc\\_2016\\_08.pdf](https://bruegel.org/wp-content/uploads/2016/04/pc_2016_08.pdf)
- Vickery, G. & Wurzburg, G. (1998). The Challenge of Measuring and Evaluating Organisational Change in Enterprises. OECD - <https://www.oecd.org/sti/ind/1943397.pdf>
- Walker, R. M., Chen, J., & Aravind, D. (2015). Management innovation and firm performance: An integration of research findings. *European Management Journal*, 33(5), 407-422.
- Walsh, J.P. & Ungson, G.R. (1991). Organizational Memory. *Academy of Management Review*, 16, 57-91.
- Wang, C., Walker, E., & Redmond, J. (2007). Explaining the lack of strategic planning in SMEs: The importance of owner motivation. *International Journal of Organisational Behaviour*, 12 (1), 1-16
- Wang H., Begley, T., Hui C., & Lee C. (2012) Are the effects of conscientiousness on contextual and innovative performance context specific? Organizational culture as a moderator, *The International Journal of Human Resource Management*, 23:1, 174-189, DOI: 10.1080/09585192.2011.561246

- Waychal, P., Mohanty, R.P., & Verma, A. (2011). Determinants of innovation as a competence: an empirical study. *International Journal of Business Innovation and Research*, 5(2), 192.
- Weber, M. (1947). *The Theory of Social and Economic Organization*. Glencoe, IL: The Free Press, 436
- Wengel, J., Lay, G., Nylund, A., Bager-Sjögren, L., Stoneman, P., Bellini, N., Bonaccorsi, A., & Shapira, P. (2000). Analysis of empirical surveys on organisational innovation and lessons for future community innovation surveys. Scientific Follow-up of the Community Innovation Survey (CIS) Project CIS, 98(191), 483. Retrieved from <https://works.bepress.com/pshapira/97/> on 12.05.2020
- Womack, J. P., Jones, D. T., & Roos, D. (1990). *The machine that changed the world*, Simon and Schuster, New York, NY, 323.
- Yim, O. & Ramdeen, K. T. (2015). Hierarchical cluster analysis: comparison of three linkage measures and application to psychological data. *The quantitative methods for psychology*, 11(1), 8-21.
- Zaltman, G., Duncan, R., & Holbek, J. (1973). *Innovations and organizations*. New York, NY: John Wiley and Sons, 212.
- Zhang, M., & Merchant, H. (2019). A causal analysis of the role of institutions and organizational proficiencies on the innovation capability of Chinese SMEs. *International Business Review*, 101638.
- Zortea-Johnston, E., Darroch, J. & Matear, S. (2011). Business Orientations and Innovation in Small and Medium Sized Enterprises. *International Entrepreneurship and Management Journal*, 8(2), 145-164.

# ANNEXES

## Annex 1 - The questionnaire



### Business Omnibus, Spring 2017

Method: CATI (Computer-assisted telephone interviewing)

Sample: managers of 600 economically active SMEs (with up to 250 employees) in Latvia

#### Instructions for the TNS interviewers:

Good afternoon! My name is \_\_\_ and I represent the research company Kantar TNS.

We are currently conducting a survey of business executives on corporate management and development.

Could I speak with a representative from the senior management, who decides about the enterprise's development, for instance, with a senior manager, owner or a board member? Could you, please, connect me with this person?

Good afternoon! The research company Kantar TNS in cooperation with University of Latvia Foundation and with support of the patron Eigīts Dāvis Timermanis is conducting a survey of business executives about business development and innovations. The research will analyze the link between the business work organization and culture, knowledge management and organizational innovation processes, as well as recommendations for increasing the competitiveness of enterprises. We would be grateful, if you would agree to participate in this survey. Your responses will be confidential. All information will be used only in aggregated form and will not be associated with you personally. The survey will take around 15 minutes. Do you agree to participate? Thank you!

**Q1. I will read several statements about the WORK ORGANIZATION AND CULTURE in your enterprise. Please rate each on a scale from 1 to 10, where 1 means that you “fully disagree” with the statement and 10 that you “fully agree”.**

No	Statements	Fully disagree										Fully agree	(do not read) Hard to say
1.	The management trusts employees in your enterprise	1	2	3	4	5	6	7	8	9	10	99	
2.	Employees cooperate with each other	1	2	3	4	5	6	7	8	9	10	99	
3.	Employees participate in professional development trainings at least once per two years	1	2	3	4	5	6	7	8	9	10	99	
4.	Employees take initiative and look for new opportunities	1	2	3	4	5	6	7	8	9	10	99	
5.	Management involves employees in decision making processes	1	2	3	4	5	6	7	8	9	10	99	
6.	Employee contribution is evaluated against the enterprise's goals	1	2	3	4	5	6	7	8	9	10	99	
7.	Employees follow the principles of business ethics in their work	1	2	3	4	5	6	7	8	9	10	99	
8.	The enterprise is engaged in long-term strategic planning	1	2	3	4	5	6	7	8	9	10	99	

**Q2. Now I will read you a few statements about KNOWLEDGE MANAGEMENT in your enterprise. As before, please rate each of them on a scale from 1 to 10, where 1 means that you "fully disagree" with it, and 10 - "fully agree"**

No	Statements	Fully disagree										Fully agree	(do not read) Hard to say
1.	Creative discussions take place in the enterprise	1	2	3	4	5	6	7	8	9	10	99	
2.	Employees are open to sharing their knowledge with colleagues	1	2	3	4	5	6	7	8	9	10	99	
3.	Employees make an important contribution to decision making processes	1	2	3	4	5	6	7	8	9	10	99	
4.	Management strategically assesses the knowledge available to the enterprise and identifies needs for new training	1	2	3	4	5	6	7	8	9	10	99	

**Q3. Now, please, evaluate the use of WORK ORGANIZATION METHODS in your enterprise. Give the score on a scale from 1 to 10, where 1 means that the methods are "not used," but 10 - "fully implemented throughout the enterprise "**

No	Methods	Not used										Fully implemented throughout the enterprise	(do not read) Hard to say
1.	Your enterprise has project teams or working groups that include specialists from different fields	1	2	3	4	5	6	7	8	9	10	99	
2.	Systems for improving the quality of goods or services	1	2	3	4	5	6	7	8	9	10	99	
3.	Outsourcing of auxiliary functions	1	2	3	4	5	6	7	8	9	10	99	
4.	External cooperation (for example, with business associations or business support agencies)	1	2	3	4	5	6	7	8	9	10	99	

*FILTER: Asked only to companies, which have used at least one method listed in Q3 (rated it with 2-10).*

**Q4. Please, evaluate the extent to which you agree with the results, when using the four aforementioned WORKING ORGANIZATION METHODS in your enterprise. Please rate the results on a scale from 1 to 10, where 1 means that you fully disagree with it, and 10 - "fully agree."**

No	Statements	Fully disagree										Fully agree	(do not read) Hard to say
1.	As a result of the application of the aforementioned methods, the enterprise's <b>competitiveness increased</b>	1	2	3	4	5	6	7	8	9	10	99	
2.	The enterprise improved its <b>ability to introduce other innovations</b> , such as new products, services or marketing methods	1	2	3	4	5	6	7	8	9	10	99	



Please answer few questions about your enterprise:

**Q5. How long does the enterprise operate?**

1. Less than a year
2. 1 to 3 years
3. 4 to 9 years
4. 10 to 20 years
5. More than 20 years

**Q6. Does the enterprise have foreign investment in its equity capital?**

1. Yes, at least 50% of the equity capital
2. Yes, but less than 50% of the equity capital
3. No
4. *(do not read)* Difficult to say

**Business Omnibus Enterprise Profile questions:**

<b>D3.</b>	<b>In which industry does your enterprise operate?</b> <i>There are several answers possible</i>	Agriculture, forestry and fishing (A) Mining and quarrying (B) Manufacturing (C) Electricity, gas, steam and air conditioning supply (D) Water supply; sewerage; waste management and remediation activities (E) Construction (F) Wholesale and retail trade; repair of motor vehicles and motorcycles (G) Transporting and storage (H) Accommodation and food service activities (I) Information and communication (J) Financial and insurance activities (K) Real estate activities (L) Professional, scientific and technical activities (M) Administrative and support service activities (N) Public administration and defense; compulsory social security (O) Education (P) Human health and social work activities (Q) Arts, entertainment and recreation (R) Other services activities (S) Activities of households as employers; undifferentiated goods - and services - producing activities of households for own use (T) Activities of extraterritorial organizations and bodies (U)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21,
<b>D4.</b>	<b>What is the number of employees in your enterprise?</b> <i>Only 1 answer possible</i>	1 – 9 employees (micro) 10 – 49 employees (mini) 50 – 249 employees (medium) <i>Difficult to say /NA</i>	1 2 3 99
<b>D6.</b>	<b>What was the total turnover of your enterprise in the previous year (2016)?</b> <i>Only 1 answer possible</i>	Till 50.000 EUR per year 50.001 – 100.000 EUR per year 100.001 – 500.000 EUR per year 500.001 – 1.000.000 (1 million) EUR per year 1.000.001 – 2.000.000 EUR per year 2.000.001 – 5. 000.000 EUR per year More than 5 million EUR per year Difficult to say / Do not want to answer	1 2 3 4 5 6 7 8
<b>D7.</b>	<b>Where is your enterprise located?</b>	<i>Selected from a list of cities, towns and other the populated areas and regions.</i>	

**This was the last question! Thank you for your feedback!**

Answered after the interview:

The language of interview: 1. Latvian , 2. Russian. Date of the interview: 2017. \_\_\_\_\_

**Annex 2 - The original questionnaire in Latvian**

## Biznesa Omnibuss, Pavasaris 2017

Metode: CATI (datorizētās telefonintervijas)

Izlase: 600 ekonomisku aktīvu MVU (līdz 250 darbiniekiem) vadītāju aptauja visā Latvijā

Norādes TNS intervētājiem:

Labdien! Mani sauc \_\_\_ un es pārstāvu pētījumu kompāniju Kantar TNS.

Patlaban mēs veicam uzņēmumu vadītāju aptauju par uzņēmumu vadību un attīstību.

Vai es varētu runāt ar uzņēmuma augstākās vadības pārstāvi, kurš pieņem lēmumus par uzņēmuma attīstību, piemēram, uzņēmuma vadītāju, īpašnieku, valdes locekli? Vai Jūs, lūdzu, varētu mani savienot ar šo personu?

Labdien! Pētījumu kompānija Kantar TNS sadarbībā ar Latvijas universitātes Fondu un mecenāta Eigita Dāvja Timermaņa atbalstu veic uzņēmumu vadītāju aptauju par uzņēmuma attīstību un inovācijām.

Pētījumā tiks analizēta uzņēmuma darba organizācijas un kultūras saikne ar zināšanu pārvaldības un organizatorisko inovāciju procesiem, kā arī izstrādāti ieteikumi uzņēmumu konkurētspējas paaugstināšanai.

Mēs būtu ļoti pateicīgi, ja Jūs piekristu piedalīties šajā aptaujā un sniegtu savu vērtējumu. Aptauja ir konfidenciāla. Visa informācija tiks izmantota tikai apkopotā veidā un netiks saistīta ar Jums personīgi. Būs nepieciešamas aptuveni 15 minūtes, lai sniegtu atbildes uz jautājumiem. Vai Jūs piekristat piedalīties? Paldies!

**Q1. Es Jums nolasišu vairākus apgalvojumus par DARBA ORGANIZĀCIJU UN KULTŪRU Jūsu uzņēmumā. Lūdzu, novērtējiet katru no tiem skalā no 1 līdz 10, kur 1 nozīmē, ka Jūs tam “pilnībā nepiekrītat”, bet 10 – “pilnībā piekrītat”**

Nr.	Apgalvojumi	Pilnībā nepiekrītu										Pilnībā piekrītu	(nelasīt) Grūti pateikt
1.	Jūsu uzņēmumā vadība uzticas darbiniekiem	1	2	3	4	5	6	7	8	9	10	99	
2.	Darbinieki sadarbojas savā starpā	1	2	3	4	5	6	7	8	9	10	99	
3.	Darbinieki piedalās profesionālās izaugsmes apmācībās vismaz reizi divos gados	1	2	3	4	5	6	7	8	9	10	99	
4.	Darbinieki uzņemas iniciatīvu un meklē jaunas iespējas	1	2	3	4	5	6	7	8	9	10	99	
5.	Vadība iesaista darbiniekus lēmumu pieņemšanas procesos	1	2	3	4	5	6	7	8	9	10	99	
6.	Darbinieku ieguldījums tiek vērtēts atbilstoši uzņēmuma mērķiem	1	2	3	4	5	6	7	8	9	10	99	
7.	Darbinieki ievēro biznesa ētikas principus savā darbā	1	2	3	4	5	6	7	8	9	10	99	
8.	Uzņēmumā tiek veikta ilgtermiņa stratēģiskā plānošana	1	2	3	4	5	6	7	8	9	10	99	

**Q2. Tagad es Jums nolasišu vairākus apgalvojumus par ZINĀŠANU PĀRVALDĪBU Jūsu uzņēmumā. Tāpat kā iepriekš, lūdzu, novērtējiet katru no tiem skalā no 1 līdz 10, kur 1 nozīmē, ka Jūs tam “pilnībā nepiekrītat”, bet 10 – “pilnībā piekrītat”**

Nr.	Apgalvojumi	Pilnībā nepiekrītu										Pilnībā piekrītu	(nelasīt) Grūti pateikt
1.	Uzņēmumā notiek radošas diskusijas	1	2	3	4	5	6	7	8	9	10		99
2.	Darbinieki ir atvērti dalīties savās zināšanās ar kolēģiem	1	2	3	4	5	6	7	8	9	10		99
3.	Darbinieki dod nozīmīgu pienesumu lēmumu pieņemšanas procesos	1	2	3	4	5	6	7	8	9	10		99
4.	Vadība stratēģiski izvērtē uzņēmumā pieejamās zināšanas un nosaka jaunu apmācību vajadzības	1	2	3	4	5	6	7	8	9	10		99

**Q3. Tagad, lūdzu, novērtējiet DARBA ORGANIZĀCIJAS METOŽU PIELIETOŠANU Jūsu uzņēmumā. Vērtējumu sniedziet skalā no 1 līdz 10, kur 1 nozīmē, ka metodes “netiek izmantotas”, bet 10 – “pilnībā ieviestas visā uzņēmumā”**

Nr.	Apgalvojumi	Netiek izmantotas										Pilnībā ieviestas visā uzņēmumā	(nelasīt) Grūti pateikt
1.	Jūsu uzņēmumā ir projektu komandas jeb darba grupas, kas ietver dažādu jomu speciālistus	1	2	3	4	5	6	7	8	9	10		99
2.	Preču vai pakalpojumu kvalitātes uzlabošanas sistēmas	1	2	3	4	5	6	7	8	9	10		99
3.	Ārpakalpojumu izmantošana palīgfunkciju nodrošināšanai	1	2	3	4	5	6	7	8	9	10		99
4.	Ārējā sadarbība (piemēram, ar biznesa asociācijām vai biznesu atbalstošām aģentūrām)	1	2	3	4	5	6	7	8	9	10		99

*FILTRS: Uzdot tikai tiem uzņēmumiem, kam Q3. tiek izmantota vismaz viena metode (atzīmēti kodi 2-10).*

**Q4. Novērtējiet, cik lielā mērā piekrītat apgalvojumiem par iepriekšējā sadaļā nosaukto četru DARBA ORGANIZĀCIJAS METOŽU PIELIETOŠANAS REZULTĀTIEM Jūsu uzņēmumā. Vērtējumu sniedziet skalā no 1 līdz 10, kur 1 nozīmē, ka Jūs tam “pilnībā nepiekrītat”, bet 10 – “pilnībā piekrītat”.**

Nr.	Apgalvojumi	Pilnībā nepiekrītu										Pilnībā piekrītu	(nelasīt) Grūti pateikt
1.	Iepriekš nosaukto metožu pielietošanas rezultātā paaugstinājās uzņēmuma konkurētspēja	1	2	3	4	5	6	7	8	9	10		99
2.	Uzlabojās uzņēmuma spēja ieviest citas inovācijas, piemēram, jaunas preces, pakalpojumus vai mārketinga metodes	1	2	3	4	5	6	7	8	9	10		99

**Turpinājumā daži jautājumi par Jūsu uzņēmumu:**

**Q5. Cik gadus uzņēmums darbojas?**

1. Mazāk par gadu
2. 1 līdz 3 gadus
3. 4 līdz 9 gadus
4. 10 līdz 20 gadus
5. Vairāk nekā 20 gadus

**Q6. Vai uzņēmuma pamatkapitālā ir ārvalstu ieguldījumi?**

1. Jā, vismaz 50% no pamatkapitāla
2. Jā, bet mazāk kā 50% no pamatkapitāla
3. Nav
4. (nelasīt) Grūti pateikt

**Biznesa Omnibusa uzņēmumu profila jautājumi:**

<b>D3.</b>	<b>Kāda ir Jūsu uzņēmuma darbības nozare?</b> <i>Iespējamas vairākas atbildes</i>	Lauksaimniecība, mežsaimniecība un zivsaimniecība (A) Ieguves rūpniecība un karjeru izstrāde (B) Apstrādes rūpniecība (C) Elektroenerģija, gāzes apgāde, siltumapgāde un gaisa kondicionēšana (D) Ūdens apgāde; notekūdeņu, atkritumu apsaimniekošana un sanācija (E) Būvniecība (F) Vairumtirdzniecība un mazumtirdzniecība; automobiļu un motociklu remonts (G) Transports un uzglabāšana (H) Izmitināšana un ēdināšanas pakalpojumi (I) Informācijas un komunikācijas pakalpojumi (J) Finanšu un apdrošināšanas darbības (K) Operācijas ar nekustamo īpašumu (L) Profesionālie, zinātniskie un tehniskie pakalpojumi (M) Administratīvo un apkalpojošo dienestu darbība (N) Valsts pārvalde un aizsardzība; obligātā sociālā apdrošināšana (O) Izglītība (P) Veselība un sociālā aprūpe (Q) Māksla, izklaide un atpūta (R) Citi pakalpojumi (S) Mājsaimniecību kā darba devēju darbība; pašpatēriņa preču ražošana un pakalpojumu sniegšana individuālajās mājsaimniecībās (T) Ārpus teritoriālo organizāciju un institūciju darbība (U)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21,
<b>D4.</b>	<b>Kāds ir darbinieku skaits Jūsu uzņēmumā?</b> <i>Iespējama tikai 1 atbilde</i>	1 – 9 darbinieki (mikro) 10 – 49 darbinieki (mazie) 50 – 249 darbinieki (vidējais) <i>(šai grupai jautājumu bloks netiek uzdots)</i> 250 un vairāk darbinieki (lielais) <i>Grūti pateikt/NA</i>	1 2 3 4 99
<b>D6.</b>	<b>Kāds iepriekšējā (2016.) gadā bija Jūsu uzņēmuma kopējais apgrozījums?</b> <i>Iespējama tikai 1 atbilde</i>	Līdz 50.000 eiro gadā 50.001 – 100.000 eiro gadā 100.001 – 500.000 eiro gadā 500.001 – 1.000.000 (1 miljons) eiro gadā 1.000.001 – 2.000.000 eiro gadā 2.000.001 – 5. 000.000 eiro gadā Vairāk nekā 5 miljoni eiro gadā Nezinu, grūti pateikt / Nevēlos atbildēt	1 2 3 4 5 6 7 8
<b>D7.</b>	<b>Kur atrodas Jūsu uzņēmums?</b>	<i>Saraksts ar pilsētām un pagastiem – apdzīvoto vietu un reģionu piekodē no tā.</i>	

**Tas bija pēdējais jautājums! Paldies par atsaucību!**

Atzīmē pēc intervijas:

Intervijas valoda

1. Latviešu 2. Krievu

Intervijas datums: 2017. gada \_\_\_\_\_

SIA TNS Latvia  
 Kronvalda Boulevard 3, Riga LV - 1010  
 Tel. 67096300

**FIELD WORK REPORT**

Study:	<b>Business Omnibus Spring 2017</b>	
Time:	18.05.2017-01.06.2017	
Method:	CATI	
Place:	whole Latvia	
Sample:	Random sample	
Number of interviews:	a) planned	635
	b) real	<b>636</b>

**Contacts with potential respondents 2802**

1) full interviews		636
2) interviews did not take place because:		<b>2166</b>
respondent refused to participate		590
refusal to connect to a senior manager		158
interrupted interview - respondent's refusal to continue the interview		7
refusal to answer by telephone, only online		61
repeatedly postponed to a later date		715
respondent was not available during the time of conducting the survey		121
respondent did not speak Latvian or Russian		8
respondent already answered for another enterprise		0
enterprise was closed		71
the enterprise was suspended		68
the enterprise was in reorganization process		5
quota full		255
enterprise did not match the target group		44
accounting contact number (outsourcing)		63

**Number of calls: 3824**

did not answer	560
answering machine, fax, or modem	160
busy line	12
closed	
line	52
bad communications, broken line	4
the phone number did not match the enterprise	234

**Average duration of the whole interview (minutes): 9.98**

average duration of the organizational innovation part	4.50
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**Number of interviewers 11**

## Annex 4 - Chi-Square Tests

### The Chi-Square Tests for number for number of employees and annual turnover

#### Number of employees \* Annual turnover Crosstabulation

		Annual turnover							Total		
		Till 50.000 EUR	50.001 – 100.000 EUR	100.001 – 500.000 EUR	500.001 – 1.000.000 EUR	1.000.001 – 2.000.000 EUR	2.000.001 – 5.000.000 EUR	More than 5 million EUR		Not available	
Number of employees	1 – 9 employees (micro)	Count	139	70	61	9	5	1	1	18	304
		% within no of empl.	45.7%	23.0%	20.1%	3.0%	1.6%	.3%	.3%	5.9%	100.0%
		% within annual turnover	93.3%	78.7%	42.7%	12.2%	9.8%	2.9%	3.7%	50.0%	50.3%
		% of total	23.0%	11.6%	10.1%	1.5%	.8%	.2%	.2%	3.0%	50.3%
	10 – 49 employees (small)	Count	9	17	80	56	28	11	8	15	224
		% within no of empl.	4.0%	7.6%	35.7%	25.0%	12.5%	4.9%	3.6%	6.7%	100.0%
		% within annual turnover	6.0%	19.1%	55.9%	75.7%	54.9%	31.4%	29.6%	41.7%	37.1%
		% of Total	1.5%	2.8%	13.2%	9.3%	4.6%	1.8%	1.3%	2.5%	37.1%
	50 – 249 employees (med.)	Count	1	2	2	9	18	23	18	3	76
		% within no of empl.	1.3%	2.6%	2.6%	11.8%	23.7%	30.3%	23.7%	3.9%	100.0%
		% within annual turnover	.7%	2.2%	1.4%	12.2%	35.3%	65.7%	66.7%	8.3%	12.6%
		% of total	.2%	.3%	.3%	1.5%	3.0%	3.8%	3.0%	.5%	12.6%
Total	Count	149	89	143	74	51	35	27	36	604	
	% within no of employees	24.7%	14.7%	23.7%	12.3%	8.4%	5.8%	4.5%	6.0%	100.0%	
	% within annual turnover	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
	% of Total	24.7%	14.7%	23.7%	12.3%	8.4%	5.8%	4.5%	6.0%	100.0%	

#### Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	432.368 <sup>a</sup>	14	.000
Likelihood Ratio	417.975	14	.000
Linear-by-Linear Association	198.879	1	.000
N of Valid Cases	604		

a. 3 cells (12.5%) have expected count less than 5. The minimum expected count is 3.40.

#### Symmetric Measures

	Value	Approx. Sig.
Nominal by Nominal	Phi	.846
	Cramer's V	.598
N of Valid Cases	604	

## Annex 5 - Descriptives

	N	Minimum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Trust	604	1	8.33	1.661	-1.269	.099	2.336	.199
Cooperation	597	1	8.25	1.568	-.866	.100	1.338	.200
Professional development	597	1	6.71	3.078	-.596	.100	-.903	.200
Initiative	595	1	6.22	2.487	-.366	.100	-.561	.200
Inclusive decision making	602	1	7.15	2.232	-.868	.100	.479	.199
Performance evaluation	584	1	7.77	1.909	-1.116	.101	1.753	.202
Ethics	599	1	7.92	1.889	-1.133	.100	1.627	.199
Strategic planning	597	1	6.75	2.552	-.656	.100	-.287	.200
Creative discussions	601	1	6.72	2.466	-.714	.100	-.161	.199
Knowledge sharing	602	1	7.81	1.993	-1.023	.100	1.016	.199
Knowledge application	601	1	6.90	2.145	-.714	.100	.312	.199
Knowledge assessment and updating	598	1	7.01	2.290	-.829	.100	.294	.200
Teamwork	596	1	3.37	3.170	.927	.100	-.688	.200
Quality management systems	591	1	5.15	3.276	-.069	.101	-1.458	.201
Outsourcing	601	1	5.59	3.246	-.209	.100	-1.349	.199
External cooperation	602	1	4.05	3.211	.513	.100	-1.206	.199
Competitiveness	534	1	6.02	2.602	-.335	.106	-.657	.211
Innovation enabler	536	1	5.89	2.663	-.363	.106	-.729	.211

## Annex 6 - Analysis of variance

### 1) Number of employees

		Sum of Squares	df	Mean Square	F	Sig.
Trust	Between Groups	56.930	2	28.465	10.654	.000
	Within Groups	1605.816	601	2.672		
	Total	1662.747	603			
Cooperation	Between Groups	124.486	2	62.243	27.574	.000
	Within Groups	1340.824	594	2.257		
	Total	1465.310	596			
Professional development	Between Groups	55.035	2	27.518	2.924	.055
	Within Groups	5590.666	594	9.412		
	Total	5645.702	596			
Initiative	Between Groups	11.138	2	5.569	.900	.407
	Within Groups	3662.458	592	6.187		
	Total	3673.597	594			
Inclusion in decision making	Between Groups	30.062	2	15.031	3.036	.049
	Within Groups	2965.183	599	4.950		
	Total	2995.244	601			
Input evaluated against aims	Between Groups	4.332	2	2.166	.593	.553
	Within Groups	2120.921	581	3.650		
	Total	2125.253	583			
Ethics	Between Groups	97.247	2	48.623	14.233	.000
	Within Groups	2036.066	596	3.416		
	Total	2133.312	598			
Strategic planning	Between Groups	97.532	2	48.766	7.655	.001
	Within Groups	3784.280	594	6.371		
	Total	3881.812	596			
Creative discussions	Between Groups	2.737	2	1.368	.225	.799
	Within Groups	3644.741	598	6.095		
	Total	3647.478	600			
Knowledge sharing	Between Groups	70.592	2	35.296	9.129	.000
	Within Groups	2315.820	599	3.866		
	Total	2386.412	601			
Contribution to decision making	Between Groups	47.086	2	23.543	5.190	.006
	Within Groups	2712.924	598	4.537		
	Total	2760.010	600			
Knowledge assessment and updating	Between Groups	5.181	2	2.590	.493	.611
	Within Groups	3125.777	595	5.253		
	Total	3130.958	597			
Teamwork	Between Groups	426.167	2	213.084	22.753	.000
	Within Groups	5553.395	593	9.365		
	Total	5979.562	595			
Quality management systems	Between Groups	193.600	2	96.800	9.272	.000
	Within Groups	6138.695	588	10.440		
	Total	6332.294	590			
Outsourcing	Between Groups	31.722	2	15.861	1.508	.222
	Within Groups	6291.403	598	10.521		
	Total	6323.125	600			
External cooperation	Between Groups	387.966	2	193.983	20.008	.000
	Within Groups	5807.438	599	9.695		
	Total	6195.404	601			
Competitiveness	Between Groups	10.566	2	5.283	.779	.459
	Within Groups	3599.247	531	6.778		
	Total	3609.813	533			
Innovativeness	Between Groups	12.187	2	6.093	.859	.424
	Within Groups	3781.537	533	7.095		
	Total	3793.724	535			



## 2) Annual turnover

		Sum of Squares	df	Mean Square	F	Sig.
Trust	Between Groups	82.552	7	11.793	4.448	.000
	Within Groups	1580.195	596	2.651		
	Total	1662.747	603			
Cooperation	Between Groups	102.631	7	14.662	6.337	.000
	Within Groups	1362.679	589	2.314		
	Total	1465.310	596			
Professional development	Between Groups	100.049	7	14.293	1.518	.158
	Within Groups	5545.653	589	9.415		
	Total	5645.702	596			
Initiative	Between Groups	74.073	7	10.582	1.726	.100
	Within Groups	3599.524	587	6.132		
	Total	3673.597	594			
Inclusion in decision making	Between Groups	86.550	7	12.364	2.525	.014
	Within Groups	2908.694	594	4.897		
	Total	2995.244	601			
Input evaluated against aims	Between Groups	12.786	7	1.827	.498	.836
	Within Groups	2112.467	576	3.667		
	Total	2125.253	583			
Ethics	Between Groups	135.816	7	19.402	5.741	.000
	Within Groups	1997.496	591	3.380		
	Total	2133.312	598			
Strategic planning	Between Groups	186.843	7	26.692	4.255	.000
	Within Groups	3694.970	589	6.273		
	Total	3881.812	596			
Creative discussions	Between Groups	33.219	7	4.746	.779	.605
	Within Groups	3614.259	593	6.095		
	Total	3647.478	600			
Knowledge sharing	Between Groups	102.914	7	14.702	3.824	.000
	Within Groups	2283.498	594	3.844		
	Total	2386.412	601			
Contribution to decision making	Between Groups	62.278	7	8.897	1.956	.059
	Within Groups	2697.732	593	4.549		
	Total	2760.010	600			
Knowledge assessment and updating	Between Groups	43.217	7	6.174	1.180	.312
	Within Groups	3087.741	590	5.233		
	Total	3130.958	597			
Teamwork	Between Groups	684.469	7	97.781	10.858	.000
	Within Groups	5295.093	588	9.005		
	Total	5979.562	595			
Quality management systems	Between Groups	288.519	7	41.217	3.976	.000
	Within Groups	6043.775	583	10.367		
	Total	6332.294	590			
Outsourcing	Between Groups	189.815	7	27.116	2.622	.011
	Within Groups	6133.309	593	10.343		
	Total	6323.125	600			
External cooperation	Between Groups	535.050	7	76.436	8.021	.000
	Within Groups	5660.354	594	9.529		
	Total	6195.404	601			
Competitiveness	Between Groups	66.575	7	9.511	1.412	.198
	Within Groups	3543.237	526	6.736		
	Total	3609.813	533			
Innovativeness	Between Groups	37.974	7	5.425	.763	.619
	Within Groups	3755.750	528	7.113		
	Total	3793.724	535			

### 3) Years in industry

		Sum of Squares	df	Mean Square	F	Sig.
Trust	Between Groups	.744	3	.248	.090	.966
	Within Groups	1662.002	600	2.770		
	Total	1662.747	603			
Cooperation	Between Groups	10.764	3	3.588	1.463	.224
	Within Groups	1454.545	593	2.453		
	Total	1465.310	596			
Professional development	Between Groups	11.189	3	3.730	.393	.758
	Within Groups	5634.513	593	9.502		
	Total	5645.702	596			
Initiative	Between Groups	25.114	3	8.371	1.356	.255
	Within Groups	3648.482	591	6.173		
	Total	3673.597	594			
Inclusion in decision making	Between Groups	23.071	3	7.690	1.547	.201
	Within Groups	2972.173	598	4.970		
	Total	2995.244	601			
Input evaluated against aims	Between Groups	17.721	3	5.907	1.626	.182
	Within Groups	2107.533	580	3.634		
	Total	2125.253	583			
Ethics	Between Groups	14.899	3	4.966	1.395	.243
	Within Groups	2118.413	595	3.560		
	Total	2133.312	598			
Strategic planning	Between Groups	24.015	3	8.005	1.231	.298
	Within Groups	3857.797	593	6.506		
	Total	3881.812	596			
Creative discussions	Between Groups	11.591	3	3.864	.634	.593
	Within Groups	3635.887	597	6.090		
	Total	3647.478	600			
Knowledge sharing	Between Groups	37.342	3	12.447	3.169	.024
	Within Groups	2349.070	598	3.928		
	Total	2386.412	601			
Contribution to decision making	Between Groups	17.091	3	5.697	1.240	.294
	Within Groups	2742.919	597	4.595		
	Total	2760.010	600			
Knowledge assessment and updating	Between Groups	13.627	3	4.542	.866	.459
	Within Groups	3117.331	594	5.248		
	Total	3130.958	597			
Teamwork	Between Groups	22.719	3	7.573	.753	.521
	Within Groups	5956.843	592	10.062		
	Total	5979.562	595			
Quality management systems	Between Groups	30.883	3	10.294	.959	.412
	Within Groups	6301.412	587	10.735		
	Total	6332.294	590			
Outsourcing	Between Groups	126.162	3	42.054	4.051	.007
	Within Groups	6196.963	597	10.380		
	Total	6323.125	600			
External cooperation	Between Groups	113.762	3	37.921	3.729	.011
	Within Groups	6081.641	598	10.170		
	Total	6195.404	601			
Competitiveness	Between Groups	14.030	3	4.677	.689	.559
	Within Groups	3595.782	530	6.784		
	Total	3609.813	533			
Innovativeness	Between Groups	17.357	3	5.786	.815	.486
	Within Groups	3776.367	532	7.098		
	Total	3793.724	535			

4) Location type (Riga, large cities, small towns, rural areas)

		Sum of Squares	df	Mean Square	F	Sig.
Trust	Between Groups	47.849	3	15.950	5.926	.001
	Within Groups	1614.898	600	2.691		
	Total	1662.747	603			
Cooperation	Between Groups	12.040	3	4.013	1.638	.180
	Within Groups	1453.270	593	2.451		
	Total	1465.310	596			
Professional development	Between Groups	169.292	3	56.431	6.110	.000
	Within Groups	5476.410	593	9.235		
	Total	5645.702	596			
Initiative	Between Groups	19.740	3	6.580	1.064	.364
	Within Groups	3653.857	591	6.182		
	Total	3673.597	594			
Inclusion in decision making	Between Groups	9.479	3	3.160	.633	.594
	Within Groups	2985.766	598	4.993		
	Total	2995.244	601			
Input evaluated against aims	Between Groups	26.636	3	8.879	2.454	.062
	Within Groups	2098.617	580	3.618		
	Total	2125.253	583			
Ethics	Between Groups	81.926	3	27.309	7.921	.000
	Within Groups	2051.386	595	3.448		
	Total	2133.312	598			
Strategic planning	Between Groups	40.521	3	13.507	2.085	.101
	Within Groups	3841.291	593	6.478		
	Total	3881.812	596			
Creative discussions	Between Groups	73.141	3	24.380	4.072	.007
	Within Groups	3574.336	597	5.987		
	Total	3647.478	600			
Knowledge sharing	Between Groups	17.010	3	5.670	1.431	.233
	Within Groups	2369.402	598	3.962		
	Total	2386.412	601			
Contribution to decision making	Between Groups	18.030	3	6.010	1.309	.271
	Within Groups	2741.980	597	4.593		
	Total	2760.010	600			
Knowledge assessment and updating	Between Groups	22.374	3	7.458	1.425	.234
	Within Groups	3108.584	594	5.233		
	Total	3130.958	597			
Teamwork	Between Groups	105.474	3	35.158	3.543	.014
	Within Groups	5874.088	592	9.922		
	Total	5979.562	595			
Quality management systems	Between Groups	111.806	3	37.269	3.517	.015
	Within Groups	6220.488	587	10.597		
	Total	6332.294	590			
Outsourcing	Between Groups	40.452	3	13.484	1.281	.280
	Within Groups	6282.673	597	10.524		
	Total	6323.125	600			
External cooperation	Between Groups	1.737	3	.579	.056	.983
	Within Groups	6193.667	598	10.357		
	Total	6195.404	601			
Competitiveness	Between Groups	15.179	3	5.060	.746	.525
	Within Groups	3594.634	530	6.782		
	Total	3609.813	533			
Innovativeness	Between Groups	33.513	3	11.171	1.580	.193
	Within Groups	3760.211	532	7.068		
	Total	3793.724	535			

5) Location – region

		Sum of Squares	df	Mean Square	F	Sig.
Trust	Between Groups	29.145	5	5.829	2.134	.060
	Within Groups	1633.602	598	2.732		
	Total	1662.747	603			
Cooperation	Between Groups	7.068	5	1.414	.573	.721
	Within Groups	1458.242	591	2.467		
	Total	1465.310	596			
Professional development	Between Groups	33.304	5	6.661	.701	.623
	Within Groups	5612.398	591	9.496		
	Total	5645.702	596			
Initiative	Between Groups	29.716	5	5.943	.961	.441
	Within Groups	3643.881	589	6.187		
	Total	3673.597	594			
Inclusion in decision making	Between Groups	21.756	5	4.351	.872	.499
	Within Groups	2973.488	596	4.989		
	Total	2995.244	601			
Input evaluated against aims	Between Groups	28.709	5	5.742	1.583	.163
	Within Groups	2096.544	578	3.627		
	Total	2125.253	583			
Ethics	Between Groups	37.637	5	7.527	2.130	.060
	Within Groups	2095.675	593	3.534		
	Total	2133.312	598			
Strategic planning	Between Groups	60.067	5	12.013	1.858	.100
	Within Groups	3821.745	591	6.467		
	Total	3881.812	596			
Creative discussions	Between Groups	77.156	5	15.431	2.572	.026
	Within Groups	3570.321	595	6.001		
	Total	3647.478	600			
Knowledge sharing	Between Groups	34.294	5	6.859	1.738	.124
	Within Groups	2352.118	596	3.947		
	Total	2386.412	601			
Contribution to decision making	Between Groups	37.743	5	7.549	1.650	.145
	Within Groups	2722.267	595	4.575		
	Total	2760.010	600			
Knowledge assessment and updating	Between Groups	23.848	5	4.770	.909	.475
	Within Groups	3107.110	592	5.248		
	Total	3130.958	597			
Teamwork	Between Groups	170.838	5	34.168	3.470	.004
	Within Groups	5808.724	590	9.845		
	Total	5979.562	595			
Quality management systems	Between Groups	133.064	5	26.613	2.511	.029
	Within Groups	6199.230	585	10.597		
	Total	6332.294	590			
Outsourcing	Between Groups	83.435	5	16.687	1.591	.161
	Within Groups	6239.689	595	10.487		
	Total	6323.125	600			
External cooperation	Between Groups	58.842	5	11.768	1.143	.336
	Within Groups	6136.561	596	10.296		
	Total	6195.404	601			
Competitiveness	Between Groups	17.640	5	3.528	.519	.762
	Within Groups	3592.173	528	6.803		
	Total	3609.813	533			
Innovativeness	Between Groups	38.524	5	7.705	1.087	.366
	Within Groups	3755.200	530	7.085		
	Total	3793.724	535			

6) Foreign investment

		Sum of Squares	df	Mean Square	F	Sig.
Trust	Between Groups	15.899	3	5.300	1.931	.123
	Within Groups	1646.847	600	2.745		
	Total	1662.747	603			
Cooperation	Between Groups	5.560	3	1.853	.753	.521
	Within Groups	1459.750	593	2.462		
	Total	1465.310	596			
Professional development	Between Groups	50.377	3	16.792	1.780	.150
	Within Groups	5595.325	593	9.436		
	Total	5645.702	596			
Initiative	Between Groups	16.033	3	5.344	.864	.460
	Within Groups	3657.564	591	6.189		
	Total	3673.597	594			
Inclusion in decision making	Between Groups	19.950	3	6.650	1.337	.262
	Within Groups	2975.294	598	4.975		
	Total	2995.244	601			
Input evaluated against aims	Between Groups	10.366	3	3.455	.948	.417
	Within Groups	2114.888	580	3.646		
	Total	2125.253	583			
Ethics	Between Groups	4.464	3	1.488	.416	.742
	Within Groups	2128.848	595	3.578		
	Total	2133.312	598			
Strategic planning	Between Groups	82.162	3	27.387	4.274	.005
	Within Groups	3799.650	593	6.408		
	Total	3881.812	596			
Creative discussions	Between Groups	37.169	3	12.390	2.049	.106
	Within Groups	3610.308	597	6.047		
	Total	3647.478	600			
Knowledge sharing	Between Groups	16.944	3	5.648	1.425	.234
	Within Groups	2369.468	598	3.962		
	Total	2386.412	601			
Contribution to decision making	Between Groups	18.750	3	6.250	1.361	.254
	Within Groups	2741.260	597	4.592		
	Total	2760.010	600			
Knowledge assessment and updating	Between Groups	18.607	3	6.202	1.184	.315
	Within Groups	3112.351	594	5.240		
	Total	3130.958	597			
Teamwork	Between Groups	145.076	3	48.359	4.907	.002
	Within Groups	5834.486	592	9.856		
	Total	5979.562	595			
Quality management systems	Between Groups	93.719	3	31.240	2.939	.033
	Within Groups	6238.576	587	10.628		
	Total	6332.294	590			
Outsourcing	Between Groups	80.613	3	26.871	2.570	.053
	Within Groups	6242.512	597	10.456		
	Total	6323.125	600			
External cooperation	Between Groups	129.397	3	43.132	4.252	.006
	Within Groups	6066.007	598	10.144		
	Total	6195.404	601			
Competitiveness	Between Groups	82.964	3	27.655	4.156	.006
	Within Groups	3526.849	530	6.654		
	Total	3609.813	533			
Innovativeness	Between Groups	38.308	3	12.769	1.809	.144
	Within Groups	3755.416	532	7.059		
	Total	3793.724	535			

## 7) Industries

### Manufacturing

		Sum of Squares	df	Mean Square	F	Sig.
Trust	Between Groups	41.088	1	41.088	15.253	.000
	Within Groups	1621.658	602	2.694		
	Total	1662.747	603			
Cooperation	Between Groups	26.645	1	26.645	11.020	.001
	Within Groups	1438.665	595	2.418		
	Total	1465.310	596			
Professional development	Between Groups	168.785	1	168.785	18.336	.000
	Within Groups	5476.917	595	9.205		
	Total	5645.702	596			
Initiative	Between Groups	31.082	1	31.082	5.060	.025
	Within Groups	3642.515	593	6.143		
	Total	3673.597	594			
Inclusion in decision making	Between Groups	18.572	1	18.572	3.743	.053
	Within Groups	2976.672	600	4.961		
	Total	2995.244	601			
Input evaluated against aims	Between Groups	8.951	1	8.951	2.462	.117
	Within Groups	2116.303	582	3.636		
	Total	2125.253	583			
Ethics	Between Groups	116.879	1	116.879	34.604	.000
	Within Groups	2016.433	597	3.378		
	Total	2133.312	598			
Strategic planning	Between Groups	.020	1	.020	.003	.956
	Within Groups	3881.792	595	6.524		
	Total	3881.812	596			
Creative discussions	Between Groups	2.979	1	2.979	.490	.484
	Within Groups	3644.498	599	6.084		
	Total	3647.478	600			
Knowledge sharing	Between Groups	30.137	1	30.137	7.674	.006
	Within Groups	2356.275	600	3.927		
	Total	2386.412	601			
Contribution to decision making	Between Groups	17.993	1	17.993	3.931	.048
	Within Groups	2742.017	599	4.578		
	Total	2760.010	600			
Knowledge assessment and updating	Between Groups	23.859	1	23.859	4.577	.033
	Within Groups	3107.099	596	5.213		
	Total	3130.958	597			
Teamwork	Between Groups	29.791	1	29.791	2.974	.085
	Within Groups	5949.771	594	10.016		
	Total	5979.562	595			
Quality management systems	Between Groups	66.468	1	66.468	6.248	.013
	Within Groups	6265.826	589	10.638		
	Total	6332.294	590			
Outsourcing	Between Groups	.037	1	.037	.004	.953
	Within Groups	6323.087	599	10.556		
	Total	6323.125	600			
External cooperation	Between Groups	11.223	1	11.223	1.089	.297
	Within Groups	6184.180	600	10.307		
	Total	6195.404	601			
Competitiveness	Between Groups	8.190	1	8.190	1.210	.272
	Within Groups	3601.623	532	6.770		
	Total	3609.813	533			
Innovativeness	Between Groups	.031	1	.031	.004	.947
	Within Groups	3793.693	534	7.104		
	Total	3793.724	535			

## Construction

		Sum of Squares	df	Mean Square	F	Sig.
Trust	Between Groups	.004	1	.004	.001	.971
	Within Groups	1662.743	602	2.762		
	Total	1662.747	603			
Cooperation	Between Groups	2.001	1	2.001	.814	.367
	Within Groups	1463.309	595	2.459		
	Total	1465.310	596			
Professional development	Between Groups	11.510	1	11.510	1.215	.271
	Within Groups	5634.192	595	9.469		
	Total	5645.702	596			
Initiative	Between Groups	.108	1	.108	.018	.895
	Within Groups	3673.488	593	6.195		
	Total	3673.597	594			
Inclusion in decision making	Between Groups	.532	1	.532	.107	.744
	Within Groups	2994.712	600	4.991		
	Total	2995.244	601			
Input evaluated against aims	Between Groups	.057	1	.057	.016	.901
	Within Groups	2125.197	582	3.652		
	Total	2125.253	583			
Ethics	Between Groups	4.021	1	4.021	1.128	.289
	Within Groups	2129.291	597	3.567		
	Total	2133.312	598			
Strategic planning	Between Groups	4.141	1	4.141	.635	.426
	Within Groups	3877.671	595	6.517		
	Total	3881.812	596			
Creative discussions	Between Groups	5.297	1	5.297	.871	.351
	Within Groups	3642.180	599	6.080		
	Total	3647.478	600			
Knowledge sharing	Between Groups	1.458	1	1.458	.367	.545
	Within Groups	2384.954	600	3.975		
	Total	2386.412	601			
Contribution to decision making	Between Groups	.578	1	.578	.126	.723
	Within Groups	2759.432	599	4.607		
	Total	2760.010	600			
Knowledge assessment and updating	Between Groups	.531	1	.531	.101	.751
	Within Groups	3130.427	596	5.252		
	Total	3130.958	597			
Teamwork	Between Groups	129.532	1	129.532	13.152	.000
	Within Groups	5850.030	594	9.849		
	Total	5979.562	595			
Quality management systems	Between Groups	11.468	1	11.468	1.069	.302
	Within Groups	6320.826	589	10.731		
	Total	6332.294	590			
Outsourcing	Between Groups	101.564	1	101.564	9.778	.002
	Within Groups	6221.561	599	10.387		
	Total	6323.125	600			
External cooperation	Between Groups	24.591	1	24.591	2.391	.123
	Within Groups	6170.812	600	10.285		
	Total	6195.404	601			
Competitiveness	Between Groups	.000	1	.000	.000	.996
	Within Groups	3609.813	532	6.785		
	Total	3609.813	533			
Innovativeness	Between Groups	.050	1	.050	.007	.933
	Within Groups	3793.674	534	7.104		
	Total	3793.724	535			

Trade

		Sum of Squares	df	Mean Square	F	Sig.
Trust	Between Groups	2.664	1	2.664	.966	.326
	Within Groups	1660.083	602	2.758		
	Total	1662.747	603			
Cooperation	Between Groups	.104	1	.104	.042	.837
	Within Groups	1465.205	595	2.463		
	Total	1465.310	596			
Professional development	Between Groups	48.037	1	48.037	5.106	.024
	Within Groups	5597.665	595	9.408		
	Total	5645.702	596			
Initiative	Between Groups	.007	1	.007	.001	.973
	Within Groups	3673.590	593	6.195		
	Total	3673.597	594			
Inclusion in decision making	Between Groups	10.443	1	10.443	2.099	.148
	Within Groups	2984.801	600	4.975		
	Total	2995.244	601			
Input evaluated against aims	Between Groups	.013	1	.013	.004	.952
	Within Groups	2125.240	582	3.652		
	Total	2125.253	583			
Ethics	Between Groups	7.272	1	7.272	2.042	.154
	Within Groups	2126.040	597	3.561		
	Total	2133.312	598			
Strategic planning	Between Groups	17.502	1	17.502	2.695	.101
	Within Groups	3864.310	595	6.495		
	Total	3881.812	596			
Creative discussions	Between Groups	7.898	1	7.898	1.300	.255
	Within Groups	3639.579	599	6.076		
	Total	3647.478	600			
Knowledge sharing	Between Groups	3.063	1	3.063	.771	.380
	Within Groups	2383.349	600	3.972		
	Total	2386.412	601			
Contribution to decision making	Between Groups	1.137	1	1.137	.247	.619
	Within Groups	2758.873	599	4.606		
	Total	2760.010	600			
Knowledge assessment and updating	Between Groups	8.853	1	8.853	1.690	.194
	Within Groups	3122.105	596	5.238		
	Total	3130.958	597			
Teamwork	Between Groups	70.715	1	70.715	7.109	.008
	Within Groups	5908.847	594	9.948		
	Total	5979.562	595			
Quality management systems	Between Groups	7.620	1	7.620	.710	.400
	Within Groups	6324.675	589	10.738		
	Total	6332.294	590			
Outsourcing	Between Groups	251.757	1	251.757	24.838	.000
	Within Groups	6071.368	599	10.136		
	Total	6323.125	600			
External cooperation	Between Groups	45.747	1	45.747	4.463	.035
	Within Groups	6149.656	600	10.249		
	Total	6195.404	601			
Competitiveness	Between Groups	2.915	1	2.915	.430	.512
	Within Groups	3606.897	532	6.780		
	Total	3609.813	533			
Innovativeness	Between Groups	2.040	1	2.040	.287	.592
	Within Groups	3791.684	534	7.101		
	Total	3793.724	535			



## Services

		Sum of Squares	df	Mean Square	F	Sig.
Trust	Between Groups	2.574	1	2.574	.933	.334
	Within Groups	1660.173	602	2.758		
	Total	1662.747	603			
Cooperation	Between Groups	7.865	1	7.865	3.211	.074
	Within Groups	1457.445	595	2.449		
	Total	1465.310	596			
Professional development	Between Groups	.014	1	.014	.001	.969
	Within Groups	5645.688	595	9.489		
	Total	5645.702	596			
Initiative	Between Groups	2.450	1	2.450	.396	.530
	Within Groups	3671.147	593	6.191		
	Total	3673.597	594			
Inclusion in decision making	Between Groups	3.495	1	3.495	.701	.403
	Within Groups	2991.749	600	4.986		
	Total	2995.244	601			
Input evaluated against aims	Between Groups	.328	1	.328	.090	.764
	Within Groups	2124.925	582	3.651		
	Total	2125.253	583			
Ethics	Between Groups	14.423	1	14.423	4.064	.044
	Within Groups	2118.889	597	3.549		
	Total	2133.312	598			
Strategic planning	Between Groups	13.018	1	13.018	2.002	.158
	Within Groups	3868.795	595	6.502		
	Total	3881.812	596			
Creative discussions	Between Groups	2.944	1	2.944	.484	.487
	Within Groups	3644.533	599	6.084		
	Total	3647.478	600			
Knowledge sharing	Between Groups	3.289	1	3.289	.828	.363
	Within Groups	2383.123	600	3.972		
	Total	2386.412	601			
Contribution to decision making	Between Groups	1.712	1	1.712	.372	.542
	Within Groups	2758.298	599	4.605		
	Total	2760.010	600			
Knowledge assessment and updating	Between Groups	.309	1	.309	.059	.808
	Within Groups	3130.649	596	5.253		
	Total	3130.958	597			
Teamwork	Between Groups	5.919	1	5.919	.589	.443
	Within Groups	5973.643	594	10.057		
	Total	5979.562	595			
Quality management systems	Between Groups	26.599	1	26.599	2.485	.116
	Within Groups	6305.695	589	10.706		
	Total	6332.294	590			
Outsourcing	Between Groups	14.515	1	14.515	1.378	.241
	Within Groups	6308.610	599	10.532		
	Total	6323.125	600			
External cooperation	Between Groups	6.918	1	6.918	.671	.413
	Within Groups	6188.485	600	10.314		
	Total	6195.404	601			
Competitiveness	Between Groups	.154	1	.154	.023	.880
	Within Groups	3609.659	532	6.785		
	Total	3609.813	533			
Innovativeness	Between Groups	13.729	1	13.729	1.940	.164
	Within Groups	3779.994	534	7.079		
	Total	3793.724	535			

## Annex 7 - Correlation matrix of organizational culture, knowledge management and organizational innovation indicators

	Cooperation	Professional development	Initiative	Inclusion in decision	Performance evaluation	Ethics	Strategic planning	Creative discussions	Knowledge sharing	Knowledge application	Knowledge assessment	Teamwork	Quality management	Outsourcing	External cooperation
Trust	.567 **	.215 **	.298 **	.32 0**	.28 7**	.54 1**	.10 1*	.21 8**	.33 5**	.28 9**	.16 5**	-.04 3	0.0 15	.06 1	-.02 9
Cooperation		.263 **	.416 **	.31 6**	.32 8**	.54 5**	.13 2**	.32 6**	.47 6**	.38 7**	.25 3**	-.00 7	.03 2	.08 2*	.02 2
Professional development			.484 **	.37 6**	.40 6**	.40 3**	.36 0**	.37 3**	.37 4**	.41 9**	.49 4**	.19 3**	.18 1**	.13 0**	.20 8**
Initiative				.57 4**	.39 0**	.43 1**	.30 2**	.42 4**	.40 7**	.56 7**	.36 0**	.13 3**	.16 6**	.17 0**	.11 1**
Inclusion in decision making					.45 1**	.35 1**	.21 9**	.39 9**	.37 2**	.62 6**	.36 4**	.10 3*	.14 0**	.12 0**	.10 7**
Performance evaluation						.41 1**	.24 6**	.28 6**	.34 0**	.38 1**	.36 8**	.12 8**	.21 1**	.10 3*	.12 2**
Ethics							.23 2**	.33 5**	.48 3**	.45 4**	.39 0**	.04 9	.13 0**	.07 7	.05 3
Strategic planning								.38 8**	.24 9**	.28 3**	.42 0**	.25 0**	.29 5**	.18 7**	.24 3**
Creative discussions									.54 0**	.40 4**	.40 0**	.20 6**	.20 4**	.23 2**	.16 2**
Knowledge sharing										.56 9**	.40 2**	.09 8*	.18 9**	.16 3**	.11 2**
Knowledge application											.48 5**	.15 0**	.21 2**	.16 8**	.12 7**
Knowledge assessment and updating												.20 3**	.26 0**	.15 2**	.21 3**
Teamwork													.35 8**	.31 3**	.30 7**
Quality management systems														.28 4**	.24 0**
Outsourcing															.27 2**

\*\* Correlation is significant at the 0.01 level (2-tailed)

\* Correlation is significant at the 0.05 level (2-tailed)

## Annex 8 - Case summaries for regression analysis

### Manufacturing and construction

	Mahalanobis Distance	Cook's Distance	Centered Leverage Value	COVRATIO	Standardized DFFIT	Standardized DFBETA Intercept	Standardized DFBETA Performance evaluation	Standardized DFBETA Strategic planning	Standardized DFBETA K. creation sharing	Standardized DFBETA turnover
1	6.637	0.010	0.051	1.072	-0.223	0.045	-0.095	-0.106	0.017	0.162
17	3.593	0.004	0.028	1.053	0.149	0.009	0.070	0.022	-0.026	-0.117
18	5.507	0.028	0.043	0.984	0.379	-0.118	0.172	0.048	0.091	-0.261
23	3.964	0.012	0.031	1.019	0.246	0.083	-0.116	0.061	0.091	-0.164
30	8.543	0.013	0.066	1.088	0.254	0.014	0.051	-0.190	0.109	-0.078
36	3.864	0.002	0.030	1.069	0.108	0.085	-0.051	-0.015	0.001	-0.059
38	2.895	0.001	0.022	1.070	-0.050	-0.004	-0.005	-0.008	-0.011	0.040
39	6.791	0.004	0.053	1.093	0.149	0.041	0.054	-0.108	0.003	-0.055
51	10.118	0.007	0.078	1.123	-0.185	-0.123	-0.059	0.051	0.132	0.068
59	4.843	0.002	0.038	1.081	-0.098	0.009	0.007	-0.041	-0.036	0.071
88	15.406	0.030	0.119	1.144	0.388	0.362	-0.266	-0.068	-0.050	-0.076
95	10.845	0.002	0.084	1.141	-0.106	-0.091	0.083	-0.007	0.001	0.034
97	3.650	0.008	0.028	1.036	-0.197	0.003	-0.001	-0.060	-0.061	0.153
112	3.166	0.011	0.025	1.006	-0.236	-0.131	0.069	0.066	-0.055	0.141
113	2.499	0.015	0.019	0.962	-0.273	-0.091	0.036	-0.011	-0.060	0.212
138	5.671	0.051	0.044	0.908	-0.511	0.146	-0.264	0.103	-0.158	0.306
141	2.187	0.000	0.017	1.063	0.049	0.034	-0.036	-0.007	0.009	-0.002
146	4.512	0.030	0.035	0.949	-0.391	0.244	-0.116	-0.122	-0.188	0.120
153	2.101	0.000	0.016	1.065	-0.030	0.014	-0.006	-0.010	-0.013	0.010
155	2.402	0.000	0.019	1.069	-0.013	0.005	0.002	-0.002	-0.010	0.003
165	4.586	0.002	0.036	1.078	0.104	-0.023	0.037	-0.061	0.053	-0.030
169	1.713	0.002	0.013	1.043	-0.101	-0.036	-0.032	-0.027	0.048	0.066
170	2.029		0.016							
172	6.758	0.023	0.052	1.029	0.344	-0.120	0.191	-0.267	0.108	0.069
174	1.632	0.000	0.013	1.062	0.019	-0.006	-0.002	0.003	0.013	-0.005
186	4.533	0.007	0.035	1.056	-0.182	-0.090	0.099	0.084	-0.086	0.034
187	1.178	0.023	0.009	0.800	-0.350	0.052	-0.206	-0.085	0.159	-0.002
190	0.980	0.000	0.008	1.057	-0.004	0.001	-0.003	0.000	0.001	0.001
193	4.215	0.015	0.033	1.009	-0.275	-0.066	0.224	-0.070	-0.090	-0.103
194	4.033	0.018	0.031	0.992	0.299	-0.154	0.010	0.115	0.175	-0.089
208	5.718	0.056	0.044	0.891	0.538	0.406	-0.120	-0.345	-0.118	0.054
213	2.307	0.000	0.018	1.067	0.026	-0.001	0.000	0.014	0.004	-0.017
217	4.028	0.006	0.031	1.050	-0.178	0.012	-0.140	0.025	0.059	0.082
219	1.550	0.003	0.012	1.034	0.116	0.018	0.018	0.052	-0.018	-0.082
220	3.507	0.001	0.027	1.074	0.065	0.044	-0.042	0.035	-0.018	-0.013
226	1.103	0.001	0.009	1.051	-0.054	-0.024	0.004	0.016	-0.008	0.029
229	1.060	0.000	0.008	1.058	0.010	0.006	0.000	-0.003	-0.001	-0.006
238	5.955	0.003	0.046	1.089	-0.120	-0.108	0.020	0.043	0.061	0.022
243	6.943	0.006	0.054	1.088	-0.178	-0.078	0.002	-0.124	0.133	0.051
253	4.036		0.031							
256	11.311	0.009	0.088	1.132	-0.208	-0.170	0.148	0.071	-0.016	0.011
261	1.745	0.000	0.014	1.059	-0.047	0.005	-0.001	-0.002	-0.023	0.027
265	2.101	0.005	0.016	1.024	-0.159	0.032	-0.061	-0.040	-0.018	0.103
267	1.320	0.000	0.010	1.057	0.033	0.009	0.009	0.008	-0.010	-0.023
279	4.666	0.001	0.036	1.082	0.083	0.010	0.024	-0.066	0.022	-0.017
282	0.475	0.005	0.004	0.972	0.151	0.079	-0.008	-0.063	-0.006	-0.023
286	1.339	0.003	0.010	1.026	0.123	-0.001	0.012	0.012	0.039	-0.079
293	1.088	0.001	0.008	1.043	-0.077	-0.039	0.051	-0.021	-0.014	0.017
295	6.352	0.000	0.049	1.104	-0.020	-0.001	-0.005	0.018	-0.006	-0.002
305	0.162	0.000	0.001	1.049	0.016	-0.003	0.002	-0.001	0.004	0.003
310	4.483	0.026	0.035	0.963	0.367	-0.168	0.216	-0.166	0.006	0.222
316	5.453	0.047	0.042	0.914	-0.491	0.108	0.151	0.222	-0.425	-0.108
324	0.226	0.000	0.002	1.047	0.031	0.017	-0.004	-0.002	-0.004	-0.008
325	2.122	0.000	0.016	1.064	0.039	-0.006	-0.004	0.028	0.005	-0.016
326	1.090	0.010	0.008	0.931	0.230	-0.087	0.094	0.102	-0.021	-0.009

	Mahalanobis Distance	Cook's Distance	Centered Leverage Value	COVRATIO	Standardized DFFIT	Standardized DFBETA Intercept	Standardized DFBETA Performance evaluation	Standardized DFBETA Strategic planning	Standardized DFBETA K. creation sharing	Standardized DFBETA turnover
328	6.870	0.007	0.053	1.086	0.183	0.005	0.141	-0.104	-0.069	-0.011
329	2.710	0.013	0.021	0.978	0.260	-0.167	0.149	-0.074	0.110	0.022
331	1.837	0.004	0.014	1.025	-0.145	-0.046	-0.042	-0.067	0.099	0.050
335	1.495	0.000	0.012	1.059	0.031	0.007	0.009	0.012	-0.022	0.000
337	4.239	0.022	0.033	0.975	-0.336	0.261	-0.088	-0.064	-0.177	-0.072
341	4.166	0.001	0.032	1.081	0.057	0.047	-0.001	-0.010	-0.042	-0.004
343	6.763	0.001	0.052	1.103	-0.085	-0.049	-0.009	-0.041	0.069	0.037
346	2.316	0.007	0.018	1.013	-0.187	-0.034	0.056	-0.149	0.049	0.010
350	10.481	0.002	0.081	1.138	-0.098	-0.008	0.052	0.046	-0.078	-0.008
357	4.908	0.012	0.038	1.038	-0.244	-0.119	0.115	0.159	-0.093	-0.025
364	3.491	0.007	0.027	1.038	0.186	-0.117	0.010	0.048	0.070	0.097
368	5.076	0.024	0.039	0.989	0.350	-0.100	-0.173	0.137	0.246	0.005
371	3.441	0.001	0.027	1.069	-0.086	0.029	-0.048	-0.044	0.018	0.033
372	1.068	0.003	0.008	1.022	-0.118	-0.008	0.050	-0.045	-0.051	0.036
375	2.520	0.001	0.020	1.064	0.061	-0.038	0.005	0.023	0.025	0.016
376	3.733	0.016	0.029	0.994	0.282	0.231	-0.143	0.114	-0.146	-0.048
377	0.566	0.001	0.004	1.030	0.083	0.026	-0.025	0.041	-0.020	0.007
382	2.967	0.008	0.023	1.021	0.199	-0.061	0.004	-0.087	0.073	0.154
385	0.689	0.005	0.005	0.979	-0.157	-0.048	0.051	-0.084	0.002	0.058
388	4.452	0.003	0.035	1.072	-0.125	0.063	0.032	-0.033	-0.070	-0.063
389	2.106	0.000	0.016	1.066	-0.020	0.000	0.009	-0.015	-0.002	0.001
390	0.512	0.000	0.004	1.051	0.023	-0.003	0.002	0.000	0.010	-0.007
396	2.217	0.015	0.017	0.950	0.273	0.006	0.004	0.214	-0.060	-0.112
398	2.211	0.010	0.017	0.989	0.221	-0.083	-0.017	-0.003	0.067	0.164
399	4.926	0.008	0.038	1.054	0.204	0.164	-0.142	0.036	-0.068	0.033
401	0.199	0.000	0.002	1.049	0.018	0.005	-0.007	0.002	0.002	0.004
403	2.669	0.003	0.021	1.047	-0.130	-0.035	-0.027	-0.082	0.085	0.047
406	5.401	0.002	0.042	1.086	-0.103	-0.044	0.069	-0.073	0.017	0.001
415	7.987	0.012	0.062	1.084	0.242	0.001	0.137	0.109	-0.187	-0.027
418	0.729	0.004	0.006	0.993	-0.143	-0.068	0.002	0.064	0.036	-0.044
419	4.538	0.024	0.035	0.974	-0.352	-0.144	0.248	-0.181	0.044	-0.103
420	2.493	0.000	0.019	1.067	-0.044	-0.024	0.036	-0.011	-0.004	-0.007
424	3.834	0.008	0.030	1.038	-0.200	-0.070	0.058	0.062	0.035	-0.149
426	4.757	0.015	0.037	1.020	-0.276	-0.021	-0.079	0.157	0.077	-0.190
430	2.088	0.002	0.016	1.049	0.099	-0.018	-0.043	-0.009	0.078	0.018
436	5.578	0.000	0.043	1.096	-0.021	-0.013	-0.005	0.001	0.019	-0.002
438	0.479	0.001	0.004	1.037	-0.065	-0.013	0.025	-0.029	-0.001	-0.007
456	5.195	0.000	0.040	1.092	0.043	-0.005	0.025	0.022	-0.024	-0.015
457	1.846	0.008	0.014	0.993	0.197	0.033	-0.140	0.013	0.109	0.038
464	7.027	0.001	0.054	1.107	0.069	0.002	-0.054	0.019	0.039	0.019
465	2.659	0.009	0.021	1.009	-0.209	0.112	-0.112	-0.094	0.011	0.021
474	4.000	0.000	0.031	1.083	-0.008	0.004	-0.002	0.005	-0.005	-0.002
475	2.254	0.007	0.017	1.013	0.184	0.110	0.027	-0.038	-0.131	0.035
479	1.495	0.007	0.012	0.983	0.194	0.047	0.054	0.077	-0.137	0.002
482	0.199	0.002	0.002	1.016	0.088	0.022	-0.031	0.010	0.009	0.019
495	2.987	0.001	0.023	1.064	0.085	-0.017	0.036	-0.038	0.034	-0.034
496	0.779	0.005	0.006	0.988	-0.152	-0.038	-0.063	0.072	0.027	0.026
500	2.177	0.000	0.017	1.065	0.038	0.025	-0.016	0.022	-0.017	-0.010
502	0.864	0.000	0.007	1.051	0.041	0.032	-0.020	0.003	-0.008	-0.008
503	8.920		0.069							
506	9.579	0.014	0.074	1.099	-0.264	0.013	-0.175	0.210	0.020	-0.007
510	6.104	0.010	0.047	1.063	0.228	0.207	-0.128	0.069	-0.103	-0.072
518	3.876	0.003	0.030	1.066	-0.119	0.014	0.034	0.050	-0.099	0.003
521	1.163	0.002	0.009	1.031	-0.106	0.011	-0.072	0.030	0.015	0.027
529	2.774	0.004	0.022	1.044	0.141	0.012	0.096	-0.056	-0.074	0.021
537	5.769	0.000	0.045	1.097	0.049	-0.017	-0.002	-0.021	0.020	0.041
540	7.132	0.015	0.055	1.062	-0.275	-0.089	0.164	-0.150	0.064	-0.113
541	2.110	0.001	0.016	1.061	-0.054	0.015	-0.001	0.012	-0.010	-0.043
542	4.611	0.001	0.036	1.086	-0.052	0.009	0.018	-0.010	-0.008	-0.041
545	1.928	0.000	0.015	1.063	-0.033	0.007	-0.001	-0.002	0.002	-0.025
546	4.611	0.000	0.036	1.087	0.041	-0.007	-0.014	0.008	0.006	0.032

	Mahalanobis Distance	Cook's Distance	Centered Leverage Value	COVRATIO	Standardized DFFIT	Standardized DFBETA Intercept	Standardized DFBETA Performance evaluation	Standardized DFBETA Strategic planning	Standardized DFBETA K. creation sharing	Standardized DFBETA turnover
548	4.054	0.000	0.031	1.083	0.026	-0.002	0.010	0.014	-0.017	0.004
550	5.576	0.099	0.043	0.748	0.728	-0.025	0.453	0.289	-0.381	-0.390
552	7.784	0.001	0.060	1.114	0.072	0.023	-0.010	-0.027	-0.022	0.056
553	3.165	0.001	0.025	1.072	-0.050	-0.003	-0.013	0.013	0.021	-0.035
555	5.021	0.003	0.039	1.078	-0.124	-0.009	-0.049	-0.071	0.091	0.013
563	8.790	0.051	0.068	0.993	-0.510	0.099	-0.238	-0.136	0.307	-0.245
565	0.975	0.003	0.008	1.011	0.131	-0.048	-0.008	0.012	0.047	0.068
568	4.121	0.006	0.032	1.052	-0.175	0.057	-0.065	0.105	-0.025	-0.122
571	4.333	0.005	0.034	1.062	0.153	-0.075	0.029	-0.020	0.026	0.125
577	4.315	0.002	0.033	1.073	0.111	-0.011	0.009	0.005	-0.033	0.089
578	1.801	0.010	0.014	0.967	0.230	-0.058	-0.023	0.143	0.000	0.068
579	4.628	0.008	0.036	1.052	-0.196	0.142	-0.068	0.041	-0.092	-0.106
580	5.192	0.001	0.040	1.090	0.064	-0.038	0.002	0.010	0.021	0.044
583	4.003	0.000	0.031	1.083	0.019	-0.006	-0.002	0.003	0.001	0.015
586	1.609	0.000	0.012	1.062	-0.006	-0.001	0.001	0.003	-0.001	-0.004
587	1.100	0.000	0.009	1.058	0.004	-0.001	0.000	0.002	0.000	0.002
588	3.575	0.005	0.028	1.052	0.152	-0.009	-0.029	-0.078	0.049	0.118
600	8.181	0.012	0.063	1.085	-0.249	-0.032	-0.079	0.176	0.065	-0.151
601*	17.046	0.032	0.132	1.163	-0.403	-0.110	-0.217	0.201	0.268	-0.111

\* Case excluded from the regression analysis

## Trade

	Mahalanobis Distance	Cook's Distance	Centered Leverage Value	COVRATIO	Standardized DFFIT	Standardized DFBETA Intercept	Standardized DFBETA Dev. & updating	Standardized DFBETA Turnover	Standardized DFBETA Location
3	3.688	0.007	0.035	1.062	0.168	-0.006	0.113	-0.095	-0.049
5	3.688	0.019	0.035	1.021	-0.274	0.009	-0.184	0.155	0.080
6	6.255	0.000	0.059	1.116	0.008	-0.001	0.004	-0.004	0.005
7	3.688	0.011	0.035	1.048	-0.210	0.007	-0.141	0.119	0.062
10	6.255	0.027	0.059	1.053	0.331	-0.052	0.165	-0.146	0.212
24	1.827	0.002	0.017	1.054	-0.095	-0.037	-0.028	0.066	0.033
29	3.688	0.005	0.035	1.068	-0.147	0.005	-0.098	0.083	0.043
45	1.669	0.005	0.016	1.035	-0.141	-0.107	0.024	0.096	0.047
48	2.722	0.024	0.026	0.970	-0.314	-0.036	-0.174	0.195	0.100
49	1.827	0.012	0.017	0.999	-0.217	-0.085	-0.063	0.150	0.076
67	5.045	0.002	0.048	1.097	0.088	0.001	0.027	-0.041	0.062
68	3.688	0.003	0.035	1.076	-0.115	0.004	-0.077	0.065	0.034
74	3.017	0.012	0.028	1.029	0.222	0.219	-0.138	-0.117	-0.056
75	3.134	0.013	0.030	1.030	0.226	0.219	-0.138	-0.118	-0.056
76	5.818	0.001	0.055	1.110	-0.047	-0.026	0.021	0.018	-0.033
82*	1.827	0.070	0.017	0.702	0.556	0.217	0.161	-0.385	-0.194
84	1.669	0.000	0.016	1.067	-0.001	-0.001	0.000	0.000	0.000
86	1.780	0.000	0.017	1.068	0.001	0.000	0.000	0.000	0.000
87	2.350	0.005	0.022	1.047	-0.143	-0.029	-0.068	0.093	0.047
89	4.237	0.019	0.040	1.034	0.273	0.271	-0.195	-0.123	-0.058
90	1.677	0.019	0.016	0.951	0.277	0.136	0.050	-0.195	-0.098
99	6.301	0.000	0.059	1.116	0.021	0.013	-0.011	-0.008	0.015
111	1.827	0.012	0.017	0.999	-0.217	-0.085	-0.063	0.150	0.076
116	1.600	0.007	0.015	1.017	-0.173	-0.102	-0.011	0.122	0.061
119	3.688	0.051	0.035	0.912	0.460	-0.016	0.308	-0.260	-0.135
129	3.688	0.051	0.035	0.912	0.460	-0.016	0.308	-0.260	-0.135
133	6.301	0.000	0.059	1.116	0.021	0.013	-0.011	-0.008	0.015
137	3.134	0.000	0.030	1.080	-0.039	-0.038	0.024	0.020	0.010
139	4.900	0.000	0.046	1.101	-0.005	-0.005	0.003	0.002	0.001
143	4.863	0.001	0.046	1.099	0.047	-0.018	0.024	-0.002	0.034

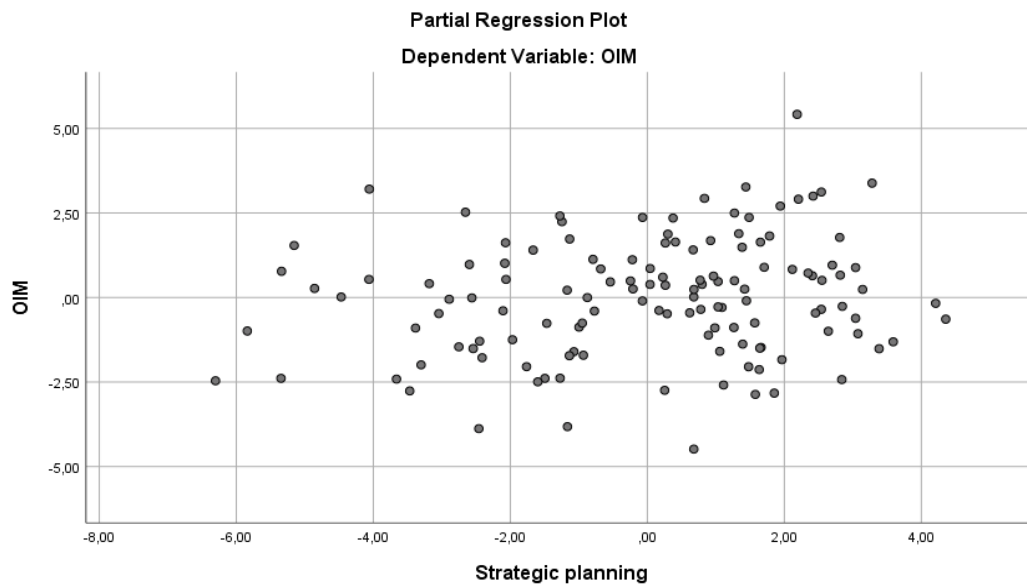
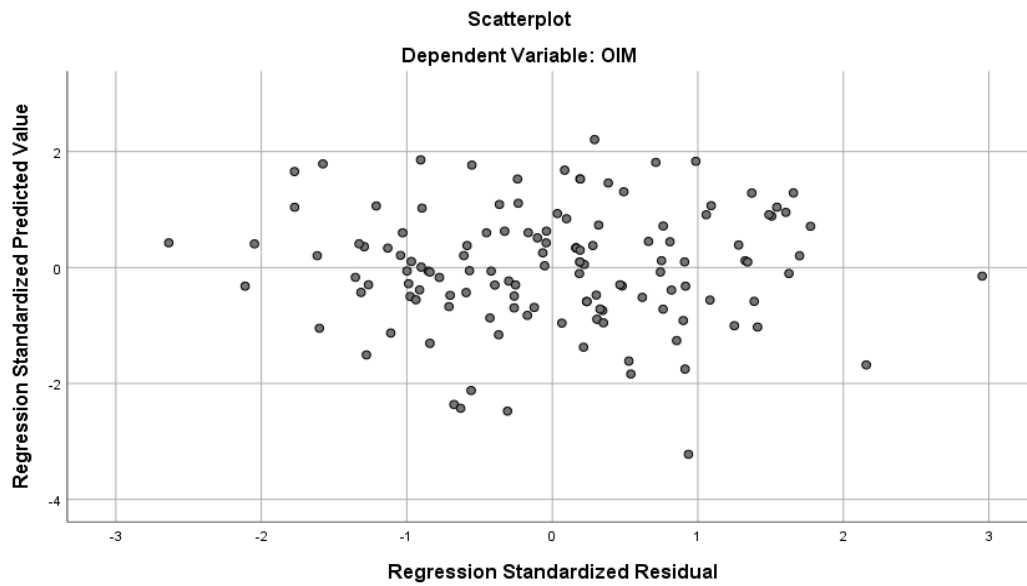
	Mahalanobis Distance	Cook's Distance	Centered Leverage Value	COVRATIO	Standardized DFFIT	Standardized DFBETA Intercept	Standardized DFBETA Dev. & updating	Standardized DFBETA Turnover	Standardized DFBETA Location
144	2.657	0.001	0.025	1.074	0.052	-0.009	0.038	-0.018	-0.017
145	3.461	0.006	0.033	1.062	-0.155	-0.026	0.034	-0.001	-0.134
161	3.345	0.002	0.032	1.076	0.090	-0.010	0.013	-0.002	0.078
162	4.094	0.001	0.039	1.089	0.065	-0.007	0.021	-0.017	0.051
163	1.299	0.006	0.012	1.020	-0.153	0.032	-0.101	0.012	0.060
164	2.020	0.000	0.019	1.069	-0.031	-0.025	0.023	-0.001	0.009
167	4.432	0.000	0.042	1.095	-0.031	0.010	-0.003	-0.014	-0.024
176	4.801	0.010	0.045	1.072	-0.195	0.044	-0.090	0.051	-0.141
185	1.299	0.001	0.012	1.059	-0.045	0.009	-0.030	0.003	0.018
188	1.144	0.004	0.011	1.030	-0.125	-0.108	0.060	0.047	0.045
192	0.482	0.000	0.005	1.054	-0.015	-0.002	-0.005	0.001	0.007
198	3.907	0.006	0.037	1.067	0.160	-0.018	0.053	-0.044	0.127
200	2.214	0.007	0.021	1.036	0.166	-0.056	0.128	-0.013	-0.057
203	8.217	0.002	0.078	1.135	-0.091	-0.058	0.064	0.013	-0.057
204	4.610	0.034	0.043	0.997	0.372	-0.169	0.164	0.071	0.276
206	2.657	0.007	0.025	1.044	-0.169	0.030	-0.125	0.060	0.055
209	3.263	0.007	0.031	1.054	0.172	-0.006	0.010	-0.002	0.149
218	0.912	0.000	0.009	1.058	-0.014	-0.012	0.005	0.006	0.006
227	3.461	0.040	0.033	0.939	-0.406	-0.070	0.089	-0.001	-0.351
232	2.214	0.022	0.021	0.959	-0.300	0.102	-0.232	0.023	0.103
234	0.680	0.001	0.006	1.045	-0.066	0.001	-0.031	0.005	0.030
235	0.754	0.000	0.007	1.055	-0.028	-0.020	0.007	0.012	0.011
244	3.470	0.004	0.032	1.068	-0.133	-0.030	0.015	0.034	-0.114
264	8.217	0.027	0.078	1.090	0.326	0.209	-0.232	-0.046	0.204
268*	0.953	0.050	0.009	0.681	0.472	-0.057	0.272	-0.035	-0.199
271	0.426	0.001	0.004	1.041	-0.066	-0.039	0.019	0.002	0.029
272	1.450	0.027	0.014	0.887	0.335	0.302	-0.191	-0.115	-0.110
275	0.754	0.001	0.007	1.047	0.066	0.049	-0.016	-0.029	-0.027
277	0.421	0.001	0.004	1.046	-0.049	-0.029	0.014	0.001	0.022
285	0.670	0.000	0.006	1.055	-0.022	-0.014	0.002	0.010	0.009
287	2.560	0.001	0.024	1.070	-0.068	-0.057	0.054	-0.001	0.017
294	0.482	0.003	0.005	1.025	-0.101	-0.010	-0.035	0.007	0.047
296	4.837	0.021	0.046	1.039	0.291	0.276	-0.247	-0.056	-0.056
298	1.450	0.002	0.014	1.052	0.083	0.075	-0.047	-0.029	-0.027
302	0.936	0.017	0.009	0.913	-0.266	0.032	-0.155	0.020	0.113
303	1.450	0.003	0.014	1.040	-0.117	-0.106	0.067	0.040	0.039
304	3.863	0.002	0.036	1.081	-0.097	-0.083	0.083	-0.003	0.020
313	8.404	0.002	0.079	1.137	-0.094	0.053	-0.023	-0.064	-0.055
314	0.576	0.001	0.005	1.042	0.069	0.016	-0.010	0.027	-0.029
315	8.152	0.018	0.077	1.106	0.264	-0.138	0.049	0.184	0.157
316	1.459	0.002	0.014	1.049	-0.093	-0.052	0.057	-0.032	0.029
373	1.486	0.008	0.014	1.013	-0.175	0.045	-0.039	-0.112	0.061
385	4.760	0.008	0.045	1.075	-0.180	-0.071	0.092	-0.004	-0.140
391	1.362	0.001	0.013	1.054	-0.072	0.005	0.001	-0.048	0.025
392	2.763	0.013	0.026	1.020	0.228	0.090	-0.140	0.130	-0.056
393	4.410	0.002	0.042	1.089	-0.094	0.016	-0.037	0.025	-0.071
400	0.690	0.002	0.007	1.038	0.086	-0.009	0.026	0.031	-0.037
407	5.857	0.011	0.055	1.085	-0.208	0.081	-0.017	-0.126	-0.144
417	4.325	0.002	0.041	1.087	-0.096	-0.033	0.043	-0.002	-0.077
446	0.876	0.019	0.008	0.898	-0.277	0.058	-0.117	-0.092	0.116
451	5.505	0.018	0.052	1.061	0.270	-0.146	0.091	0.217	-0.060
453	1.469	0.014	0.014	0.972	0.236	-0.087	0.145	0.064	-0.088
461	1.486	0.002	0.014	1.049	0.095	-0.025	0.021	0.061	-0.033
468	3.524	0.015	0.033	1.032	0.242	0.166	-0.196	0.068	-0.052
469	3.462	0.004	0.033	1.069	0.129	0.012	-0.051	0.099	-0.030
470	1.136	0.006	0.011	1.017	0.150	-0.044	0.079	0.045	-0.059
471	1.411	0.001	0.013	1.058	-0.056	-0.001	0.008	-0.038	0.019
473	4.768	0.000	0.045	1.098	0.038	-0.012	0.001	0.033	-0.008
485	3.090	0.012	0.029	1.031	0.221	-0.125	0.144	0.104	-0.065
488	1.659	0.000	0.016	1.066	0.011	-0.004	0.004	0.007	-0.004
490	1.161	0.000	0.011	1.061	0.006	0.005	-0.004	0.000	-0.002

	Mahalanobis Distance	Cook's Distance	Centered Leverage Value	COVRATIO	Standardized DFFIT	Standardized DFBETA Intercept	Standardized DFBETA Dev. & updating	Standardized DFBETA Turnover	Standardized DFBETA Location
492	0.953	0.000	0.009	1.059	0.013	-0.002	0.007	-0.001	-0.005
493	1.864	0.000	0.018	1.067	-0.034	-0.021	0.023	-0.011	0.010
498	1.144	0.000	0.011	1.058	-0.041	-0.036	0.020	0.016	0.015
499	0.533	0.000	0.005	1.051	0.037	0.005	0.000	0.015	-0.016
505	1.730	0.000	0.016	1.066	-0.025	-0.005	0.009	-0.016	0.008
506	3.461	0.012	0.033	1.041	-0.217	-0.037	0.047	-0.001	-0.187
507	0.754	0.001	0.007	1.047	0.066	0.049	-0.016	-0.029	-0.027
509	1.553	0.000	0.015	1.065	0.001	0.000	0.000	0.000	0.000
514	3.863	0.000	0.036	1.089	0.031	0.027	-0.027	0.001	-0.007
519	1.387	0.003	0.013	1.042	0.109	-0.018	0.011	0.072	-0.038
520	0.876	0.010	0.008	0.974	-0.196	0.041	-0.083	-0.065	0.082
522	2.560	0.001	0.024	1.070	-0.068	-0.057	0.054	-0.001	0.017
524	2.052	0.015	0.019	0.990	-0.245	-0.072	-0.095	0.165	0.084
533	1.486	0.002	0.014	1.049	0.095	-0.025	0.021	0.061	-0.033
534	2.833	0.002	0.027	1.071	-0.085	0.010	0.011	-0.069	0.022
543	2.833	0.005	0.027	1.056	-0.141	0.017	0.019	-0.114	0.037
554	4.843	0.001	0.046	1.098	-0.052	0.011	0.006	-0.045	0.011
562	2.772	0.001	0.026	1.071	-0.077	0.015	0.003	-0.062	0.021
566	9.130	0.018	0.086	1.119	0.270	-0.171	0.097	0.176	0.151
582	1.411	0.014	0.013	0.970	-0.235	-0.005	0.034	-0.158	0.080
585	2.784	0.002	0.026	1.067	0.099	-0.027	0.007	0.079	-0.027
589	2.969	0.000	0.028	1.080	0.021	-0.001	-0.005	0.017	589
591	3.058	0.015	0.029	1.017	-0.249	-0.007	0.079	-0.199	591
593	4.769	0.026	0.045	1.023	-0.327	0.088	0.013	-0.288	593

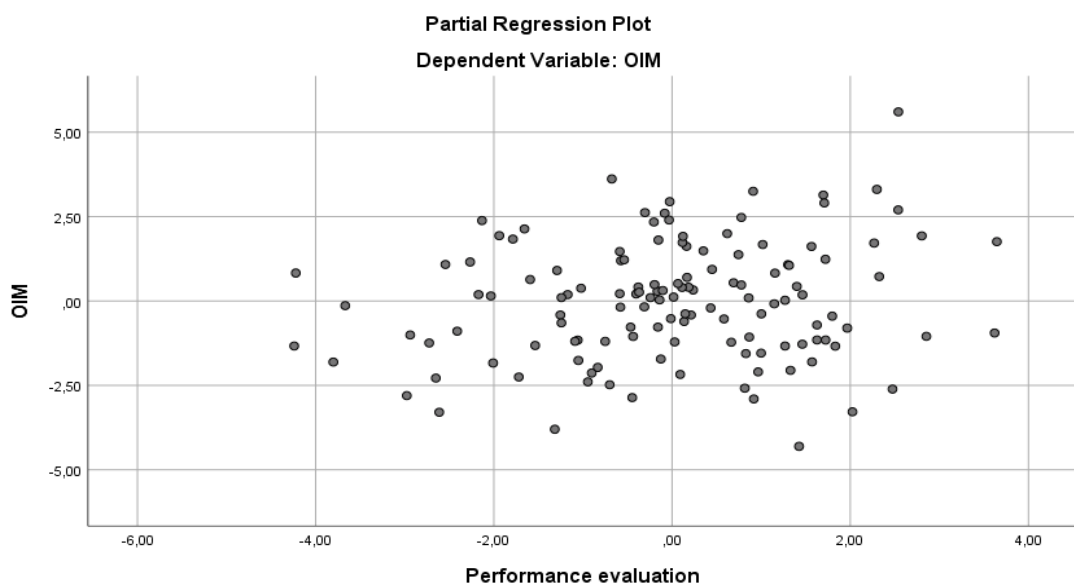
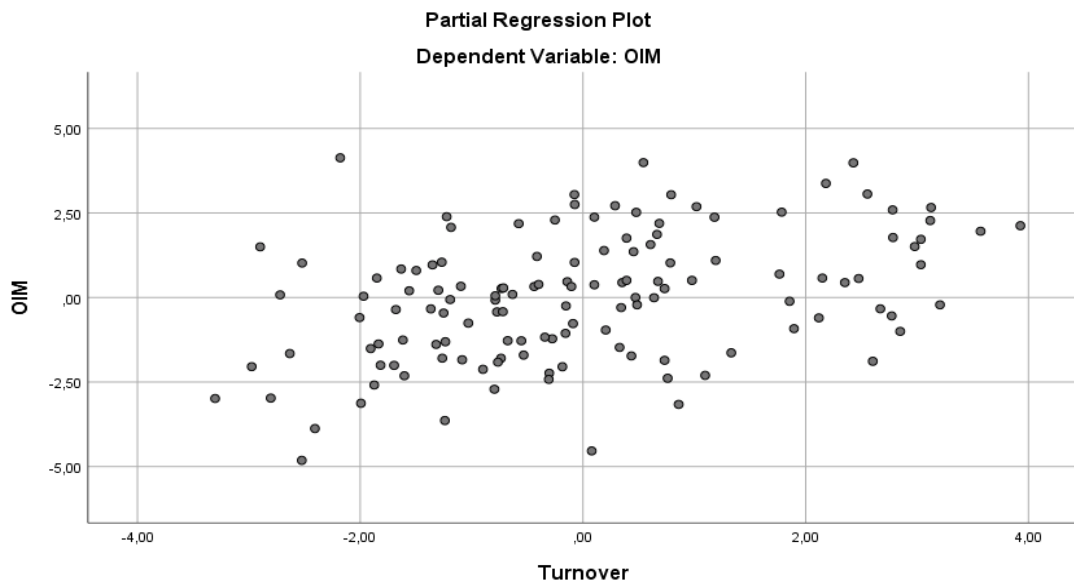
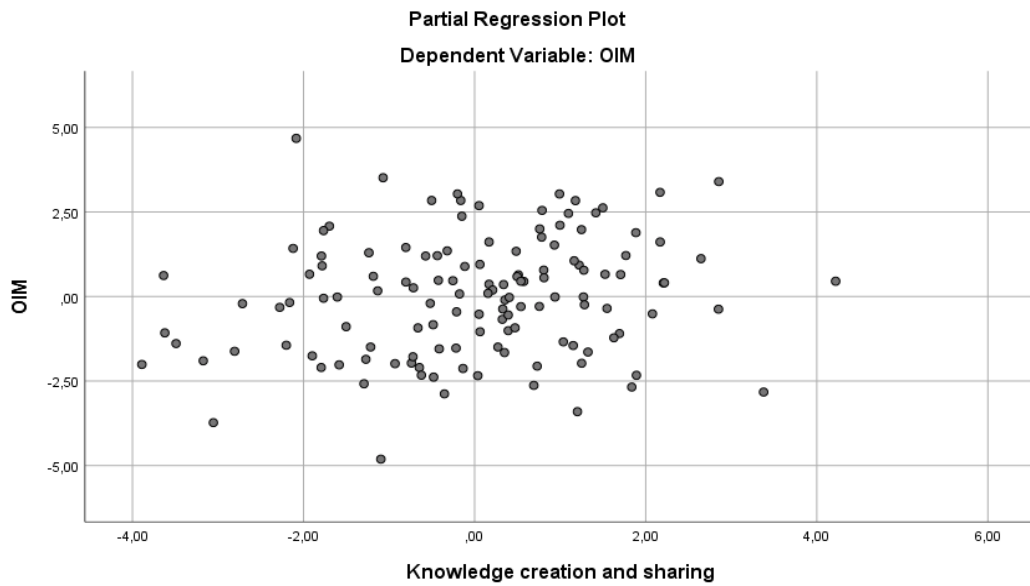
\* Cases excluded from the regression analysis

## Annex 9 – Residuals and partial regression plots

### Manufacturing and construction

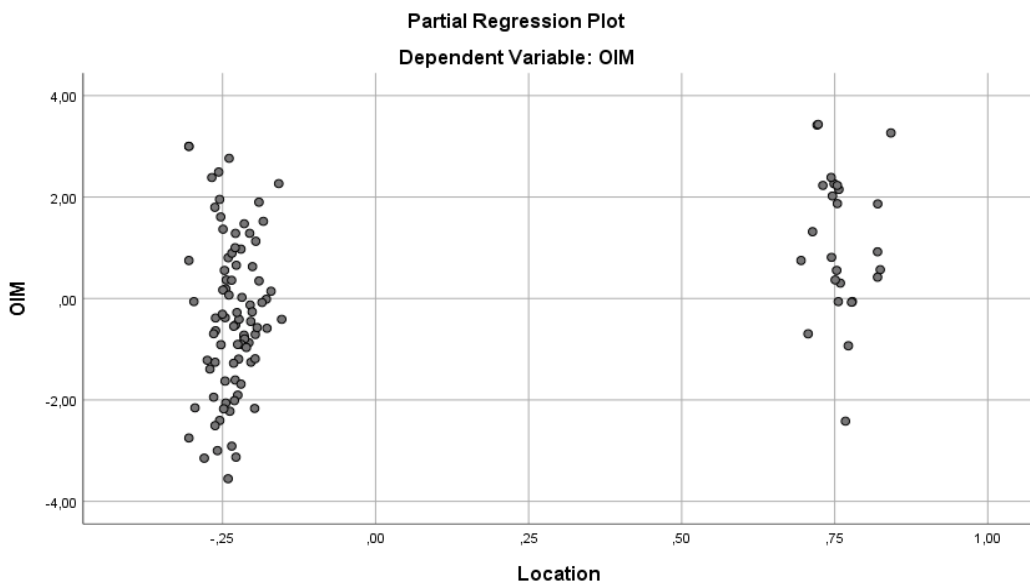
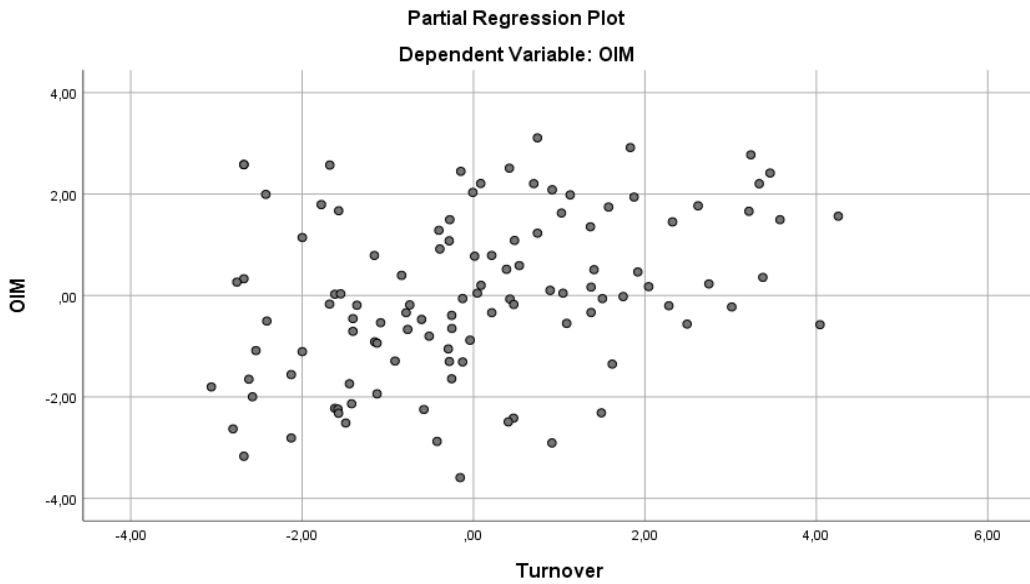
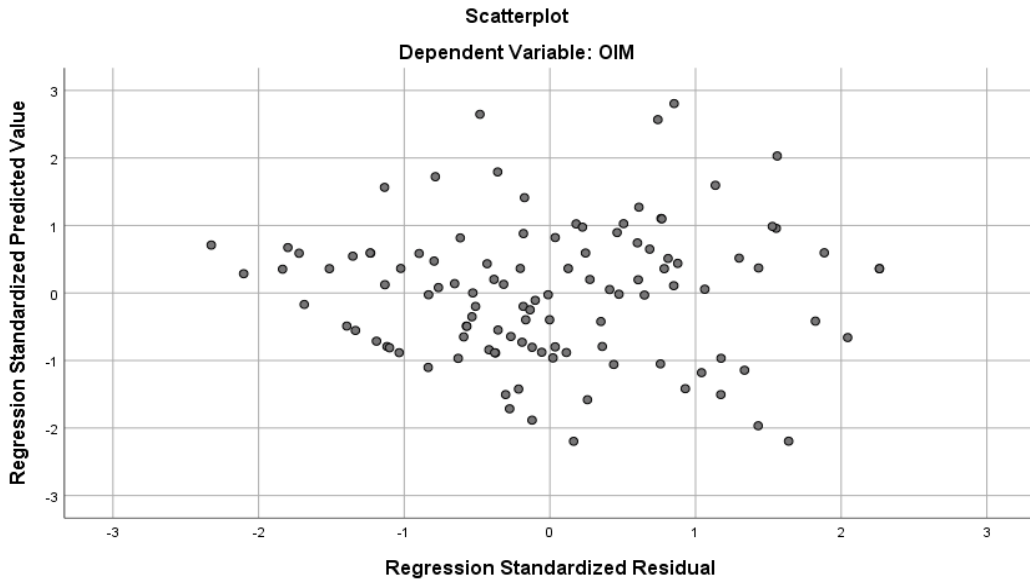


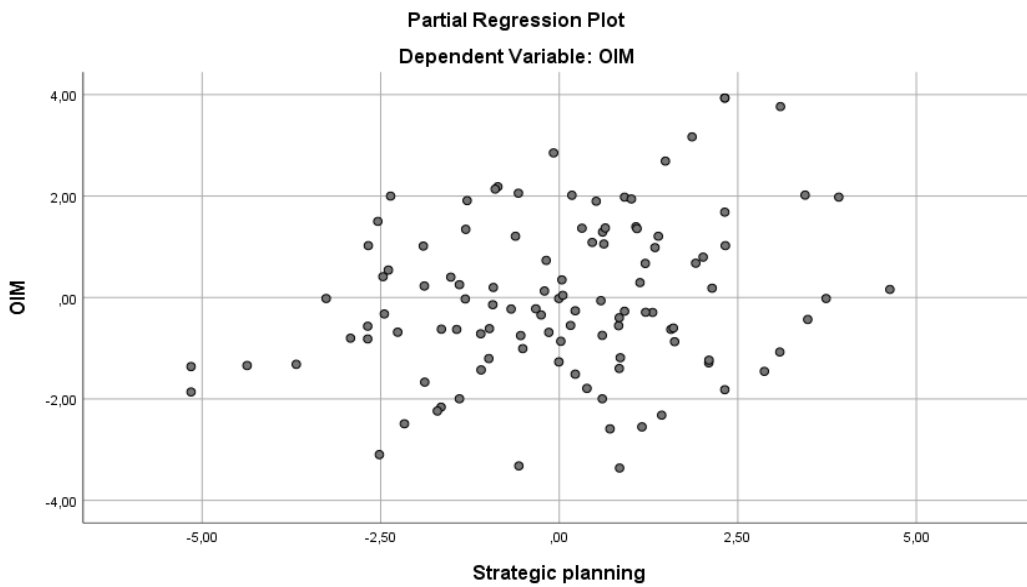
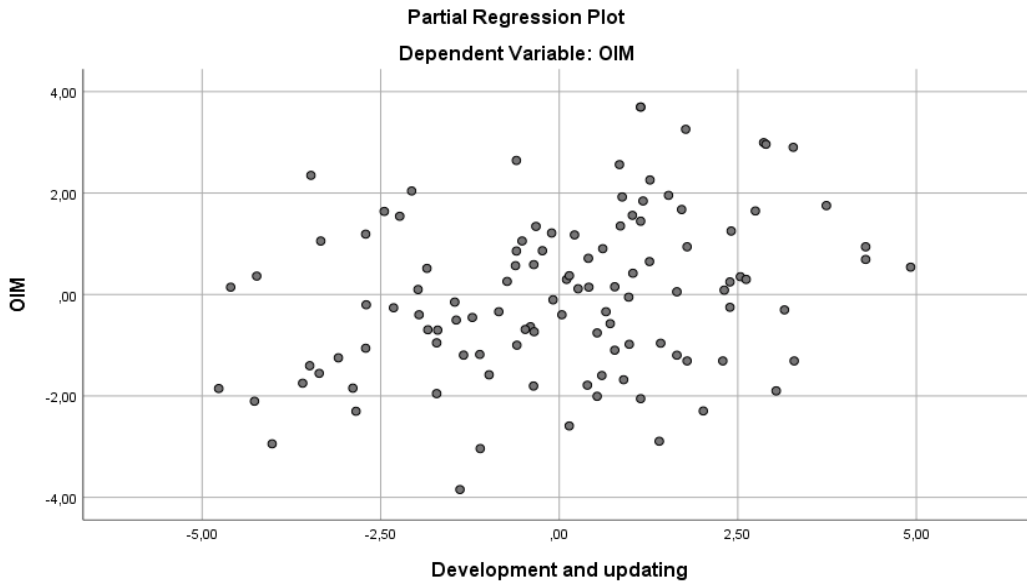




Source: Source: plots created by the author based on the survey data

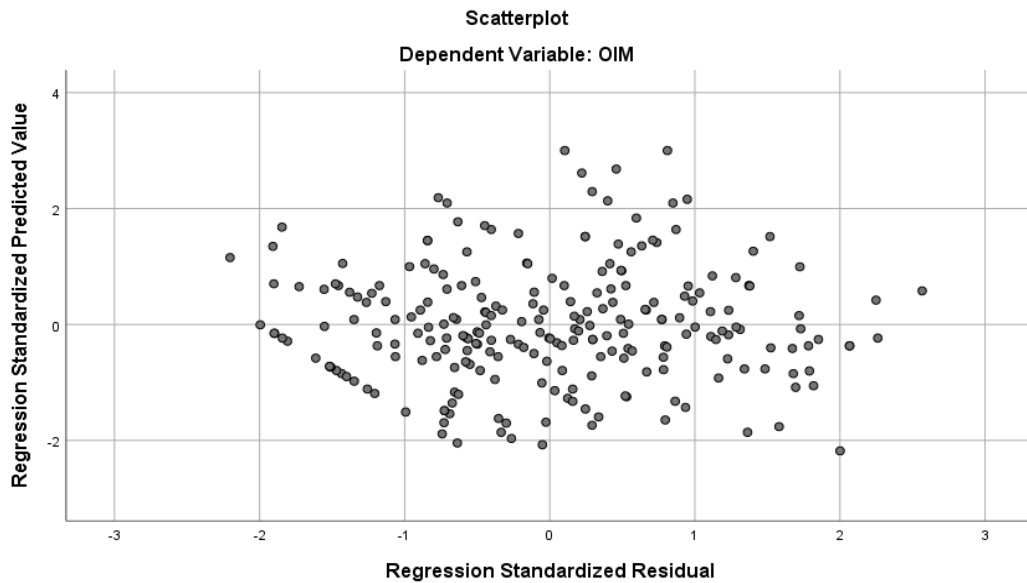
# Trade

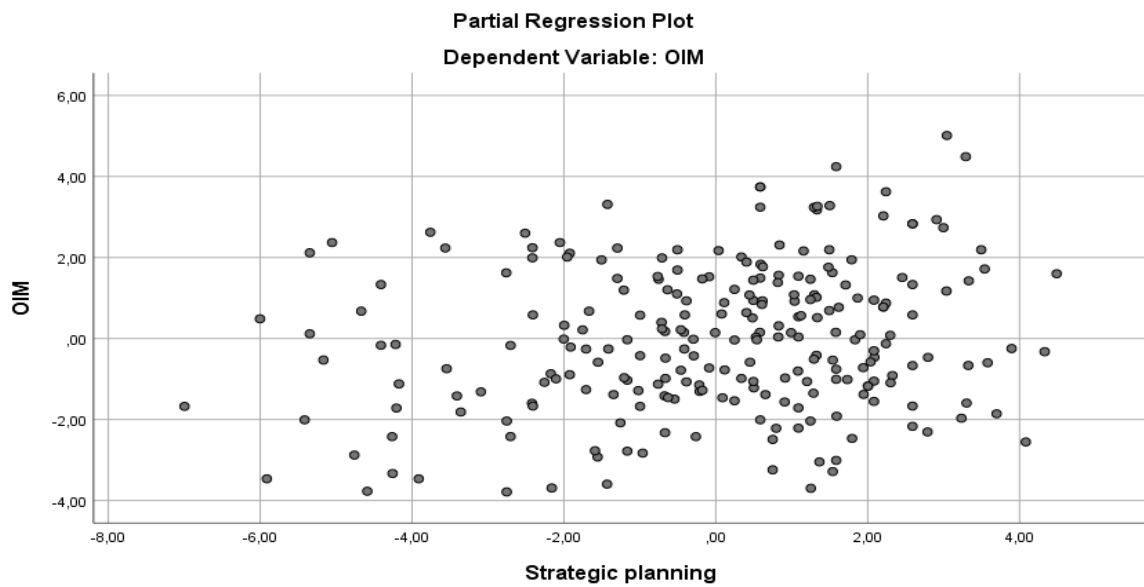
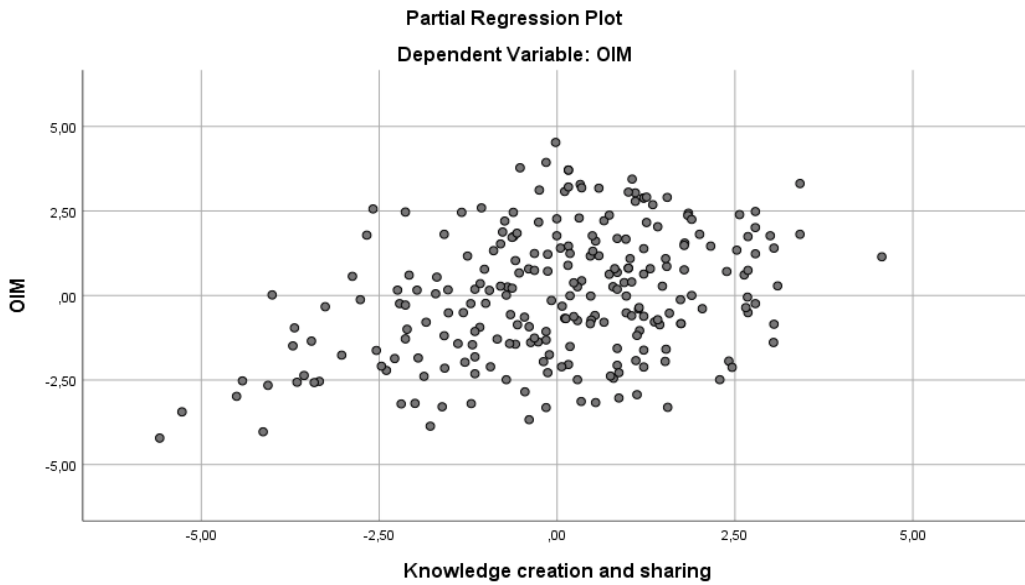
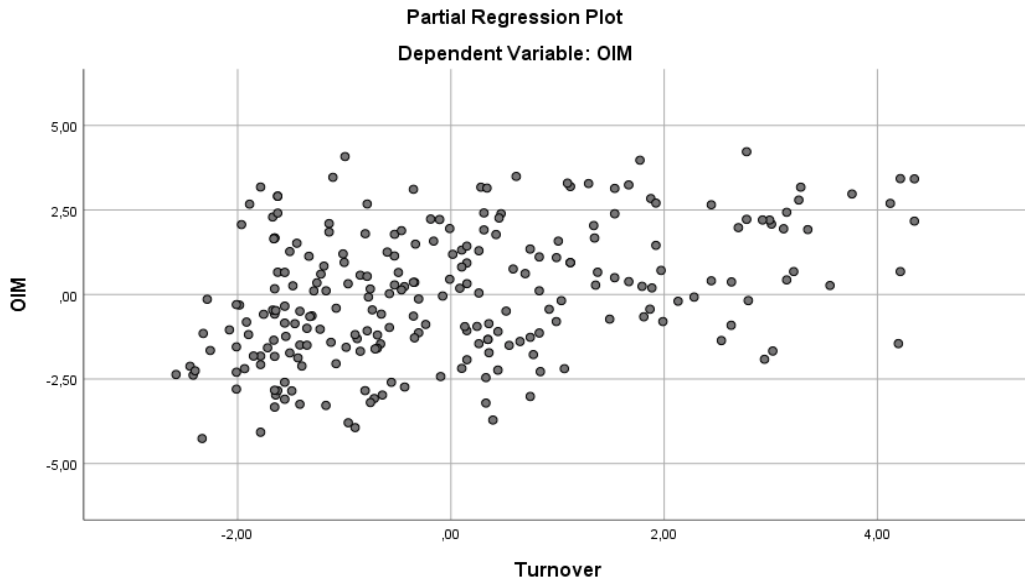




Source: Source: plots created by the author based on the survey data

**Services**





Source: plots created by the author based on the survey data

**Enterprise seminar “How organizational culture can foster organizational innovation”**

*Latvian Chamber of Commerce and Industry, Kr.Valdemāra Street 35, Riga  
February 13, 2018 15:00 – 17:00*

Presenters: Madara Apsalone and Ilona Baumann-Vītoliņa, the University of Latvia

Participants: DigiZemgus, SIA; SIA SEB Līzings; SIA EHR Mediju grupa; SIA Primum; Balticovo AS; Tilde; Biznesa augstskola Turība; Lattelecom; Nordtext; Creatiwe, SIA; OZOLS IR; Agile & CO; SIA National Export & Trading House Uzbeksitan; Poligrafika, Latvia Tours, Operetes fonds, SIA Crex Crex, LETA SIA, SIA Adllex Group, SIA Transcom Worldwide Latvia, self-employed expert, SIA Revenita, Patentu valde and AS "Grindeks"

Research support by:

Eigis Dāvis Timermanis scholarship and the University of Latvia Foundation,  
1.1.1.2/VIAA/1/16/016 - Innovation Ecosystem in the Baltic States

***Themes:***

- 1) Organizational culture of Latvian SMEs
- 2) The link between organizational culture, knowledge management and organizational innovation
- 3) Public perception of enterprises and employer branding
- 4) Motivation of millennial generation employees
- 5) The link between innovation and business competitiveness

Ilona Baumann-Vītoliņa presented employer branding methodology and employer branding index. She discussed the factors that affect public perception of an enterprise; how internal working culture, trust and cooperation affect it, and how forward looking, ethical and socially responsible enterprises can be more attractive to potential employees.

Madara Apsalone presented the study, how organizational culture supports knowledge management and organizational innovation in Latvian SMEs. She discussed the anthropological approach to organizational culture, general framework for knowledge management and organizational innovation. She presented the impact model of organizational culture, knowledge management and organizational innovation, and the main research conclusions.

Questions from the audience:

- 1) Concerns regarding the subjective nature of a survey method for innovation studies
  - The presenters explain that other data on innovation inputs and outputs are very limited for SMEs. Organizational innovation primarily concerns internal processes; thus, many outcomes cannot be measured directly, using data from public databases. Moreover, researchers cannot directly match survey results with data of general innovation outcomes – such as the financial data or the number of patents – there is a significant time lag between implementing innovation and detecting its outcomes in public data.
- 2) Question about the definition and required novelty of innovation

- The presenters explain that the study used an OECD-Eurostat approach, defining innovation as a substantially better solution that is new for the enterprise.

Discussion:

(The method - participants divided in three groups, each group discusses one theme for around 10 minutes, then all participants except one change the group to discuss another topic for around 10 minutes, finally all groups present discussion outcomes in the end).

*Theme I - How organizational culture and knowledge management practices can foster innovation – best practices from participating enterprises?*

- Participants suggested an internal job shadowing to foster internal knowledge transfer process and increase awareness of the value each employee adds to the enterprise.
- Participants discussed the importance of an open, inclusive leadership that encourages participation.
- Participants discussed the link between culture and quality management systems, and how the role of culture increased revising the quality standards from ISO 9001:2008 to ISO 9001:2015, becoming an integral part of a business approach towards quality.
- Participants discussed the importance of informal brainstorming and networking opportunities between employees and suggested giving them new perspectives by organizing various activities outside the casual business environment.
- Participants shared a knowledge creation method, where employees can suggest better products and processes based on their personal experiences, perceived market needs and external environment, including products offered by the competition.
- Participants suggested a system of recognizing and rewarding employees for innovative ideas and special contribution to the enterprise; they considered this as an essential tool for increasing employee motivation and participation. They also highlighted the importance of the managers being open to innovative ideas.
- Participants gave examples from their own experience on some methods that boost innovation. For example, an owner of one small construction enterprise mentioned that his employees are determining the amount of their salaries.

*How Latvian SMEs can become more innovative? What are the main challenges and the main business implications?*

- Participants discussed that Latvia is a small market and sometimes there is little demand for innovations, especially in the regions.
- On the other hand, many SMEs are exporting and face global competition. So, there are success stories of Latvian enterprises introducing globally new solutions even in very traditional sectors and services.
- Innovation requires a change, at the same time employees are often against the change and prefer predictable processes. Thus, it can be a managerial challenge to encourage change and provide support, making employees, especially the lower level workers, comfortable with it.
- Participants highlighted the importance of an open internal communication.

- Participants also emphasized the need of an organizational structure and vision that leadership shares with employees, thus creating a common understanding of the main aims and direction for further development.

*How an enterprise can improve the perception about it?*

- Participants discussed the role of internal working culture, including value integration and attitude towards employees. Organizations can benefit from activities they do, but also from not doing the wrong things. Employees often are motivated, and organizations should give those employees an opportunity to participate and deliver results without demotivating them.
- Participants shared the need to provide training and education for employees – both internally and externally.
- Participants discussed that it is important to provide competitive salaries and other benefits for contribution to the organization.
- Participants discussed that organizations should focus on strengthening their teams, improving communications and providing feedback to employees.
- To enhance the public image of the enterprise externally, they suggested developing a positive image of the leadership and of a socially responsible enterprise.