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IMPLEMENTATION OF SUSTAINABILITY-ORIENTED INNOVATIONS IN BUSINESS – STUDYING ORGANIZATIONAL AND EXTERNAL CAPABILITIES: EVIDENCE FROM POLAND

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ABSTRACT

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The concept of sustainability-oriented innovation is recent and still under researched. The aim of the Thesis is to contribute to the field and investigate how do companies operating in Poland apply sustainability-oriented innovation (SOI) to their core business activities, what are the differences between various business forms of organization in terms of SOI, and what type of capabilities facilitate implementation of SOI. Given early stage of empirical research on sustainability-oriented innovation, an exploratory-descriptive case study research strategy was taken applying qualitative methods. 6 interviews with managers and CEOs of 4 companies located in Warsaw were conducted. In addition, two academic expert panels with specialists from University of Lodz and Lappeenranta University of Technology were carried out in order to support the findings. The study found out that in case of companies which purpose is to create positive impact and develop sustainable products or services by using innovative approaches, SOI activities are embedded in organizational culture and process so that it is difficult to differentiate between main business activities and SOI. In the other two cases SOI practices were in line with core business activities thus reflected the main operations and were determined as a part of CSR strategy. Activities are industry specific and are contingent upon resources and capabilities possessed. Among list of success factors management support, CEO's personal values, dedicated and motivated team, investments in research and development, organizational culture, non-hierarchical communications channels, empowerment of employees, provision of time and space for failures were identified as key organizational capabilities facilitating integration of SOI practices. Whereas market demand, NGOs' pressure, regulations enforced, access to external funding, networking and cooperating present external or collaborative capabilities supporting implementation of sustainability oriented innovation in companies. SOI takes a systemic approach that drives the transformation to become sustainable business embedding and integrating social, environmental and economic value creation together.

АННОТАЦИЯ

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Концепция инноваций направленных на устойчивость является недавней и все еще недостаточно исследована. Цель диссертации – сделать вклад в этой область с практической точки зрения изучая как компании оперирующие в Польше применяют инновации направленные на устойчивость (ИНУ) в основную деловую деятельность, какие главные отличительные признаки между разными правовыми формами коммерческих организаций, форматами и индустриями а также какие способности содействуют реализации ИНУ. Учитывая раннюю стадию эмпирических исследований по ИНУ, исследовательски-описательный case study стратегия была взята применяя качественные методы. Шесть интервью с менеджерами и владельцами четырёх компаний расположенных в Варшаве были проведены. Дополнительно, две группы научных экспертов из Лодзкого Университета и Лаппенрантского Технологического Университета были опрошены для того, чтобы поддержать результаты кейсов. Исследование показало, что в случае компаний целью которых является создание позитивного влияния и разработка продуктов/услуг используя инновационный подход, практика ИНУ внедрена в организационную культуру и процессы. Поэтому трудно распознать и различить основную бизнес деятельность и ИНУ деятельность. В двух других примерах практика ИНУ соответствует главным бизнес операциям и является частью корпоративной социально ответственной политике. ИНУ деятельность отражает специфику отрасли и зависит от ресурсов и динамических способностей фирмы. Среди списка факторов успеха находятся поддержка менеджмента, персональные ценность

генерального директора или владельца, преданная и мотивированная команда, культура организации, неиерархическая структура коммуникаций, расширение прав и возможностей работников, время и место для провалов и экспериментов были определены как ключевые организационные способности, содействующие интеграции ИНУ практик. Тогда как рыночный спрос, давление со стороны общественных организаций, введение прав и норм, доступ к внешнему финансировании, нетворкинг, и сотрудничество представляют внешние или возможности совместной работы, содействующие внедрению инноваций направленных на устойчивость в компаниях. Инновации направленные на устойчивость имеют системный подход, который отражается в расширении парадигма инноваций и становится движищей силой перехода к устойчивому бизнесу, который внедряет и интегрирует создание экономической, социальной и экологической ценности.

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The hardest part which crowns the process of becoming a Master Graduate is writing the Master Thesis which reflects and proves the ability to apply the knowledge gathered from previous years, ability to work hard and reach the goal. Actually, this work is the result of efforts of dozens of people. So many things had to happen, people to be met and choices to be made so that I would be where I am now. This is the output of the collective contributions. First of all I am very grateful to my unofficial supervisor, Professor Laura Albareda Vivo for the proposal of the topic, guiding through the entire process of research and moral support as well as supervisors from Graduate School of Management. Also I am thankful to all four companies and their representatives for taking part in the study and interviews, especially Borys Cieslak from Laboratorium EE. Furthermore, I would like to express my gratitude to academic specialists for their time and critical overview of the situation, in particular to Professor Jakub Kronenberg from Lodz University for responsiveness and help in reaching academic experts in Poland.

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Finally, for urging to try and pushing to finish the Thesis as well for practical tips and advises on pre-defense presentation I am thankful to The Director of the MSIS Programme – Professor Paavo Ritala which has been an example for me of hard work, passion in teaching and responsibility for work done and people

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LIST OF ABBREVIATIONS

B2B – Business to Business

EMS – Eco-management and Audit Scheme

GRI – Global Reporting Initiative

ISO – International Organization for Standardization

LCA – Life Cycle Assessment

MNE – Multinational Enterprise

NGO – Nongovernmental Organization

R&D – Research and Development

SME – Small and Medium Enterprise

SOI – Sustainability-Oriented Innovation

SLI – System Level Innovation

1. INTRODUCTION

This Master Thesis's study "Implementation of sustainability oriented innovations in business – studying organizational and external capabilities: evidence from Poland" aims at investigating how do companies apply sustainability oriented innovations (SOI) in practice and what factors facilitate and enhance engagement in SOI activities. Poland and companies operating there form a context in which SOI phenomenon is explored.

In this proposed research, the uncharted terrain of sustainability oriented innovation will be mapped in a subset of leading businesses and explore examples of product, services and sustainable business model innovation involving cooperation and co-creation. The intent is to explore the full sustainability oriented innovation process in a sample of companies of different sizes and across industries.

Innovation is a key driver of business growth and essential to sharpening and sustaining competitive advantage. Over the past two decades, sustainability oriented innovation (hereafter "SOI") has emerged as a key subject in innovation management, strategic management and organizational studies. Indeed, SOI includes a broader scope of innovation practices, technologies, processes and strategies adopted by organizations and businesses that capture value from sustainability-driven knowledge, science and technology and create new value for the company and all their stakeholders, including society and the natural environment. Thus, the linkage between innovation and sustainability has a triple positive impact, creating economic, social and environmental value. Hence, SOI simultaneously creates new value through products, services and organizational reconfigurations and, at the same time, solves complex social and environmental challenges for society: climate change, long-term natural resource management, sustainable energy, sustainable mobility, public health, education, and job creation.

These firms are taking a core competence of their business—its capacities to innovate—and applying it to pressing issues in their corporate ecosystem. In so doing, they are drawing on the talents of their employees and assets of their core business to co-create innovation with R&D partners, environmental experts, social sector partners and other stakeholders.

SOI concept is relatively new and has numerous terms which have the same meaning and characteristics. However SOI was widely accepted as such innovations that are rather a

direction and orientation to follow by companies rather than a goal to achieve. Sustainability is taken as a driver of innovation or opportunity to change the way to run a business.

Sustainability oriented innovation according to Encyclopedia of Corporate Social Responsibility (2013) is “the commercial introduction of a new (or improved) product, product-service system, or pure service which – based on a traceable comparative analysis – leads to environmental and/or social benefits”. (Idowu et al. 2013)

While other researches on application of sustainability oriented innovations focused mainly on environmental sustainability (Dangelico and Pujari, 2010; Petraru and Gavrilescu, 2010), product innovations (Pujari, 2006, Gerstlberger et al. 2014, Hallstedt et al. 2013), product-service innovations (Williams, 2007; Tukker and Tischner, 2006; Evans et al. 2007), eco-efficiency, eco-innovations and LCA (Carrillo-Hermosilla et al., 2010; Figge and Hahn, 2004; Huppes and Ishikawa, 2005; Vogtlander et al. 2002) or innovation processes in multinational corporations, this work elaborates on transformational stages of SOI activities and capabilities required in order to facilitate the implementation of SOI in enterprises in Poland. Therefore, based on the analyzed case studies, conclusions can be drawn and best practices disseminated to other companies fostering growth and development identified.

1.1. RESEARCH PROBLEMS AND OBJECTIVES

In last years there have been a lot of studies conducted and research done that proves sustainability oriented innovation is a driving force of economic development and growth. It also gives firms competitive advantage over rivals, has positive impact on environmental capital and gives social legitimacy to operate. Yet, there are fewer studies conducted concerning practical implementation of sustainable innovation in company’s operations. Furthermore, literature on SOI is mainly concerned multinational companies operating in developed economies. Little attention has been paid to developing countries with transition economy within Europe. Moreover, no research have been done on SOI implementation from the perspective of business forms of organizations and how the adaptation of SOI practices into core operations differs in terms of various forms of business organization . Thus, to fill in the gap in the research and contribute to the literature main research questions are formed and presented below in Table 1.

Table 1. Research objectives of the Thesis Work

How do companies operating in Poland implement sustainability-oriented innovations?
What activities companies are involved in to adapt their innovation processes to drive sustainable outcomes? What are the main differences and similarities between four various business and legal forms in operationalization of sustainability-oriented innovations?
What are internal and external capabilities facilitating implementation of sustainability-oriented innovations into business operations?

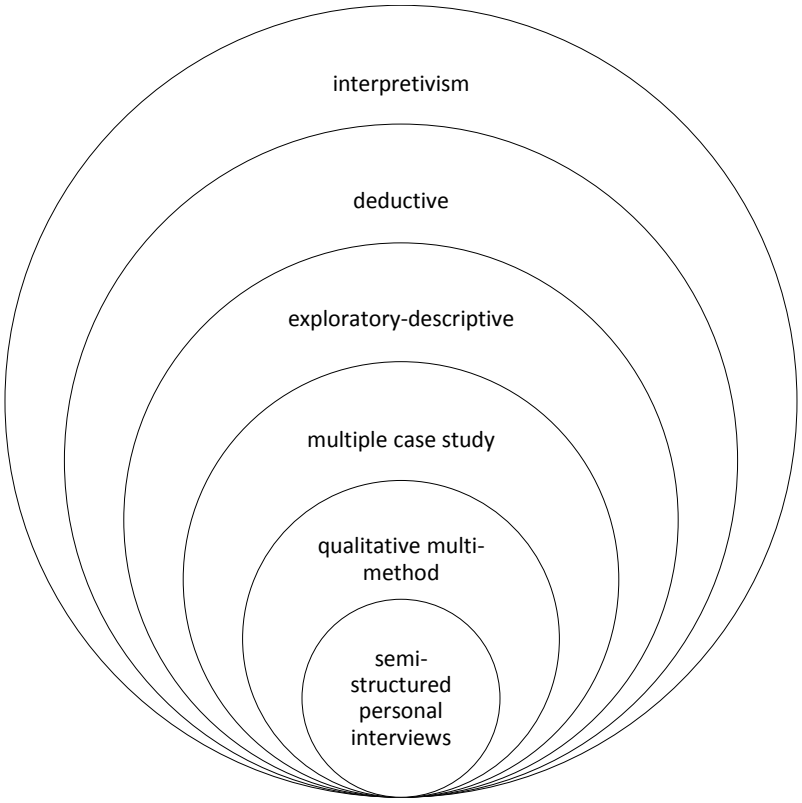
Thus, the study contributes to the literature on sustainable innovations and innovation management in Polish companies. Moreover, it has managerial implications on adaptation of SOI into core activities of the organization and what capabilities are needed to be developed in order to accelerate the incorporation of SOI.

1.2. RESEARCH DESIGN AND METHODOLOGY

The research process illustration is presented below in the form of “onion”. Research philosophy behind is interpretivism. Business situations are far too complex and unique to be limited to a series of law-like generalizations (Saunders et al. 2009) Approach for research is deductive. Deductive approach is approach in which theory and hypotheses are developed from the empirical data and a research strategy to test hypothesis is designed. Deduction means using an existing theory to formulate research questions, objectives and framework, and to organize and direct data analysis (Yin, 2014). Center of the research “onion” reflects research tactics which is about the finer detail about data collection techniques and analysis procedure. (Saunders et al. 2009) Going deeper into particularization the purpose of the study is exploratory-descriptive. In accordance with Saunders, et al. (2009) exploratory studies are useful in clarifying understanding of the issue which precise nature is unsure as it is the case here. It is also necessary to take a clear picture of the phenomena prior to data collection that is why description is in use. In terms of research design, research method used

in writing Master Thesis is a case study research. Four companies different in terms of business form, and size will be taken as case studies from different industries.

FIGURE 1. RESEARCH DESIGN



Source: based on Sanders et al. (2009) research “onion”

In addition to multiple case studies, expert panel studies will be carried out to support the results form case-companies and enhance reliability. Thus, qualitative multi-method will be employed which involved semi-structured interviews with both managers and scholars regarding the SOI activities. Therefore, the methodology of this research includes a set of stages:

1. Theoretical background
2. Case studies
   2.1. Managerial interviews
   2.2. Expert interviews

According to Yin (2014) case study is an empirical inquiry that investigates a contemporary phenomenon (the “case”) in depth and within its real world context, especially when the

boundaries between phenomenon and context may not be clearly evident. The second part of definition includes features of a case study as a criteria. Therefore, a case study inquiry:

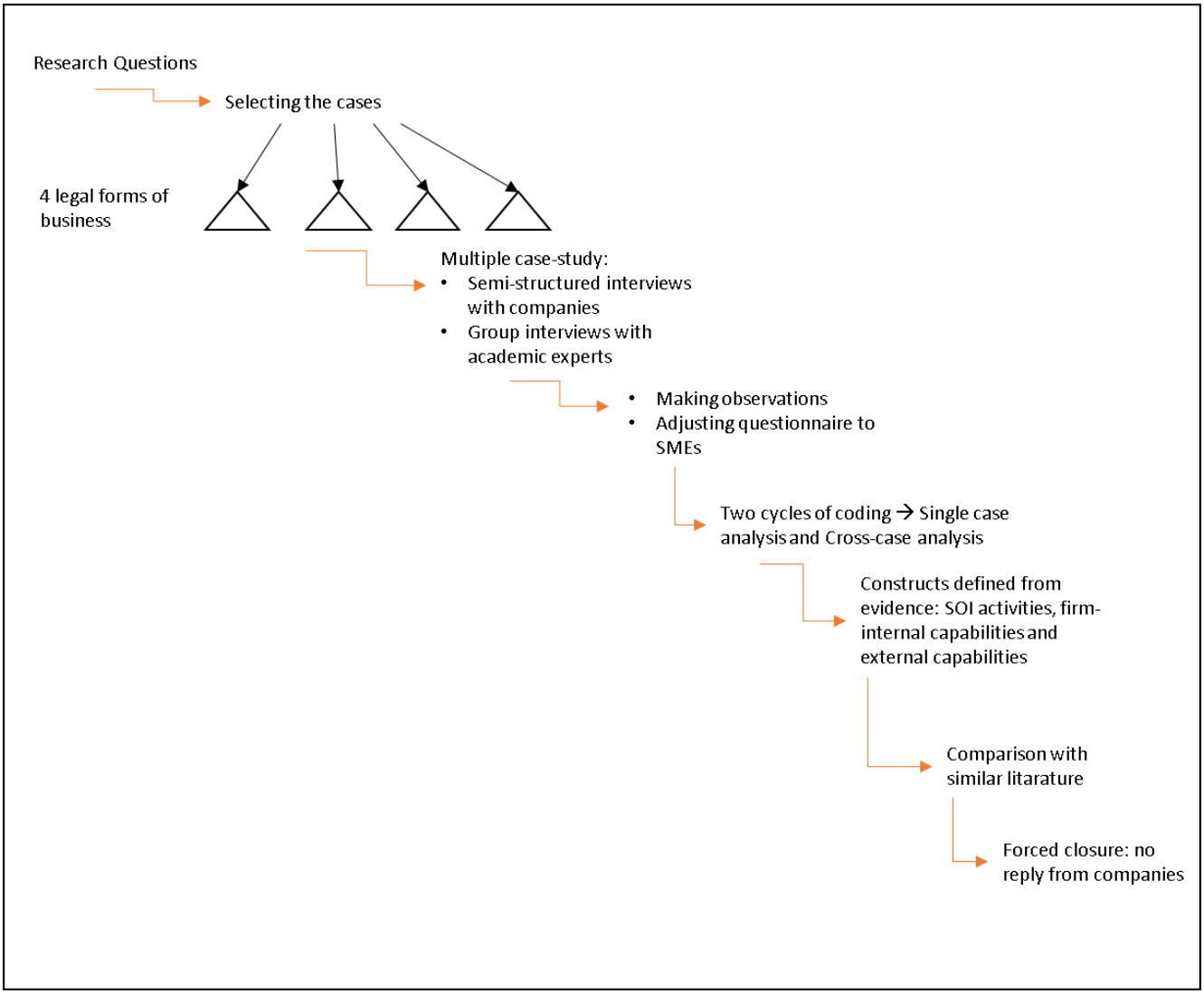
- Deals with the technically distinctive situation where there will be many more variables of interest than data points, and as one result
- Is contingent on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result
- Benefits from prior development of theoretical propositions to guide data collection and analysis.

The case study is a research strategy which concentrates on understanding the dynamics present within single settings (Eisenhardt, 1989). Two variants of case study are identified: single- and multiple-case study. In this case multiple case study is applied as four companies will be studied. Under the category of the unit of analysis, holistic or single unit of analysis is applied as the research is concerned with the organization as a whole. Data collection technique and data analysis procedure is going to be qualitative using multi-method as in addition to in-depth personal interviews of managers, academic expert interviews will be carried out. In matter of time horizon research has cross-sectional study characteristics such as study of a SOI phenomenon in a company at a particular time. This case study will be based on few interviews conducted over a short period of time. (Saunders et al. 2009)

The process of inducting theory using case studies is especially appropriate in new topic areas (Eisenhardt, 1989). Sustainability oriented innovation concept is a recent research area, thus building theories research approach is applied. To start with an initial definition of research question and a well-defined focus is essential in building theory from case studies. Specification of a research question within such a broad topic as sustainability-oriented innovation allows researcher to narrow down the span of organizations to be approached and then to gather necessary data from participants.

Research is based on theoretical sampling. The sample was not random, but reflected the selection of the particular cases in order to extend emergent theory to a broader span of organizations. Research on SOI mainly concerns large companies which are leaders in innovations and sustainability. Cases for this study were selected based on the legal forms of business organizations category. However only single case represents each category which limits the replication of the findings within categories.

Figure 2. Process of building implications from case studies



Source: Based on Eisenhardt (1989)

The case study research involves only qualitative data gathered from one investigator which is under the risk being biased by false impressions from qualitative data. To enhance data from case-companies multi method was applied by conducting group interviews with academic experts.

Entering the field is the next step following the crafting instruments stage. Overlap of data analysis and data collection is a characteristic feature of research to build theory from case studies. To accomplish this overlap field notes, a running commentary to oneself should be taken (Eisenhardt, 1989). A key to useful field notes is to write down impressions occurring

during research to select later the important observations. Thus, observations during the managerial interviews, experts' interviews and overall process of research were made. Moreover, the correction of questionnaire was done and adjusted to the specificity of the company. Key feature of such research is the freedom to make changes during the process of data collection. Alteration of data collection methods during the investigation allows to understand each case individually and more deeply.

Analyzing data is the peak and the core of the case studies research. The method applied to analyze transcribed interviews was First Cycle and Second Cycle or Pattern coding. (Miles et al. 2014) Following the codification process analysis within-case and cross-case was carried out. Within-case detailed write-ups for each site gives possibility to get familiar with each case separately. The process entails the unique patterns of each case to appear before the researcher synthesizes patterns across cases. (Eisenhardt, 1989). The main goal of within case analysis is to describe, understand, and explain what has occurred in a single, limited context (Miles et al. 2014). Cross-case comparison involves viewing data from various perspectives. The cases are collated with each other in terms of SOI activities companies engage in and firm-internal and external capabilities facilitation the implementation of SOI. Within those three categories the researcher was looking at within-group similarities together with intergroup differences.

Next step in this iterative process is the compare the emergent framework with each case to assess the fit with the data. The step is labeled as shaping hypotheses which involves measuring constructs and verification whether emergent links between constructs fit with the evidence from each case. However because indicators vary among cases and are difficult to collapse into one construct, the evidence is summarized using tables.

In the next stage emergent constructs were referred to the existing literature. Evidence from cases were collated with similar literature. That strengthens the confidence that findings are valid and generalizable. Linking results to the literature is extremely important in theory building research because the results rest on only four case-companies corroborated by experts' opinion. The last stage was forced by time limits and lack of the response from the companies approached by the researcher. Also the number of cases was planned prior to the data collection and assumed not more than six cases.

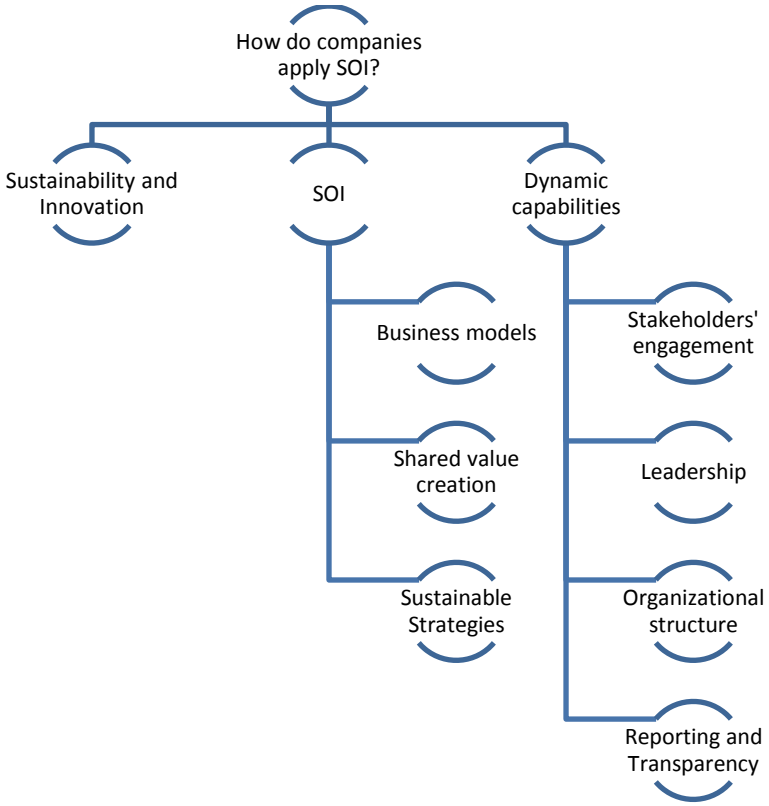
1.3. STRUCTURE OF THE STUDY

The remainder is structured as follows: the next chapter will cover theoretical underpinning of sustainability, sustainability-oriented innovations and frameworks. Also introduction into Polish economy and culture will be presented. Then, based on concept and theories related to search, research framework is developed. Research design and methods contain data collection and analysis of the in-depth interviews with management and CEOs of four companies operating in Poland. The results of the analysis and their implications are discussed next, and a concluding section summarizes the research findings.

2. THEORETICAL BACKGROUND

The main focus of the theoretical part is on sustainability oriented innovation, its origins and key drivers. Second section concentrates more on practical implementation of SOI into business practices. The link between research questions and literature is depicted from the relevance tree using key words and phrases inherent to the research study. The term sustainability oriented innovation itself depicts the sources coming from the combination of innovation process and sustainable issues and goals. Firstly, brief introduction to the sustainability concept and corporate social responsibility is given followed by the definition of innovation and its various types and applications. Resting upon those two main pillars sustainability-oriented innovation is defined together with its roots and key drivers. Shared Value is the closest to explain SOI concept. Creation of shared value claims that business can achieve profit and create economic value through solving social problems and simultaneously creating value for the society. Sustainability oriented innovation incorporates additional aspect which is creation of environmental value, therefore taking into account all three aspects: social, ecological and economic. By solving social and environmental issues and thus creating value for society and decreasing harm and damage on natural environment, companies obtain profits and gain competitive advantage. To reach that stage product or service innovation is not enough, the way of doing business must have been changed, and transformation in the entire business model is required. Sustainability thinking must be incorporated into organizations' strategy, operation and corporate culture.

FIGURE 3. RELEVANCE TREE



Source: Based on Saunders et al. (2009), p. 80

National context, industrial differences, forms of business organization, size and management board have a significant influence on the current stage of the companies in terms of SOI adoption. Consequently firms developed different dynamic capabilities which are inimitable and unique for each organization. Those cultivated since the very beginnings and gained during the growth of the operations, dynamic capabilities define to some extent the success of the SOI implementation in business practices and at the same time facilitate incorporation of SOI activities inside the company.

This chapter will proceed with the analysis of innovation, sustainability and corporate social responsibility and sustainability oriented innovation literature.

2.1. SUSTAINABILITY ORIENTED INNOVATION

Sustainability oriented innovation concept appeared recently within last few decades and rapidly became very popular and trendy among academia, businesses and policy makers. Literature on that topic is dispersed and takes various perspectives on addressing the phenomena. SOI has been an interest of strategic management literature (Wagner and Llerena, 2008; Danciu, 2013), business models (Birkin, et al., 2009; Boons and Ludeke-Freund, 2013; Ludeke-Freund, 2009; Schaltegger et al. 2012), technology and innovation management (Seebode, et al. 2012; Hansen, et al. 2009)

2.1.1. SUSTAINABILITY AND CORPORATE SOCIAL RESPONSIBILITY IN BUSINESS

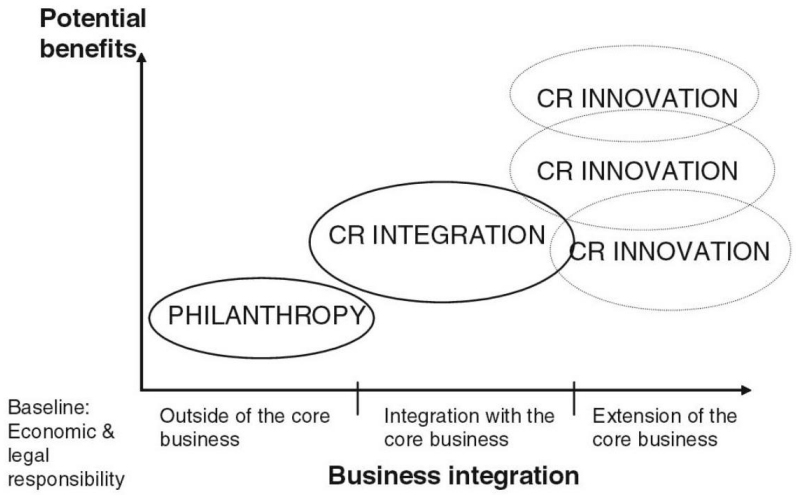
The concept of sustainability is blurry, vague and difficult to define. In the context of this study sustainability roots in the “sustainable development” term coined in Our Common Future Report by World Commission on Environment and Development (Brundtland Commission) in 1987. The Brundtland Commission defined sustainable development as "development which meets the needs of current generations without compromising the ability of future generations to meet their own needs". The concept supports strong economic and social development, in particular for people with a low standard of living. At the same time it emphasizes the importance of protecting the natural resources and the environment. Economic and social well-being cannot be improved with measures that destroy the environment. (WCED, 1987)

Such a politicized concept is difficult to transfer and apply in business context. In business sector sustainability is used interchangeably with corporate social responsibility, compliance, health & safety. Companies use this different term meaning social, environmental and economic responsibility of the company: providing jobs, paying taxes, being profitable while helping to solve social issues and deceasing damage to environment.

Elkington (1997) has transformed the sustainability concept into business context through introduction of triple bottom line perspective. Businesses are encouraged to become responsible for their operations and take environmental, social and economic aspects into decision making process.

Prior to Elkington, Carroll (1996) presented the pyramid of CSR which ranks from lowest level to the most advanced - economic responsibilities, legal responsibilities, ethical responsibilities and philanthropic responsibilities as the highest level of CSR. However studies of Halme & Laurila (2008) suggested that among three different CR action-orientation types distinguished by authors, philanthropy has the most modest social benefits together with lowest financial performance of the company. Whereas CR Integration and CR Innovation have better indicators in matter of both benefits for society and for company's profits.

FIGURE 4. LEVEL OF BUSINESS INTEGRATION OF CR TYPES AND THE POTENTIAL FOR EXPECTED FINANCIAL AND SOCIAL BENEFITS



Source: Halme & Laurila, 2008, p. 334

Companies are embedded in the society and are an integral part of it, thus their CSR activities inherent to social and political context of the state where company is present. Later in the subchapter on shared value the concept of combination of social and economic benefits is deployed more.

2.1.2. INNOVATION

When typing "innovation definition" in Google's search engine, 238 000 000 (25.05.15) results appear. Tidd and Bessant (2009) highlight that innovation is an effective technical and

commercial implementation of new or improved ideas. Innovations must have practical relevance.

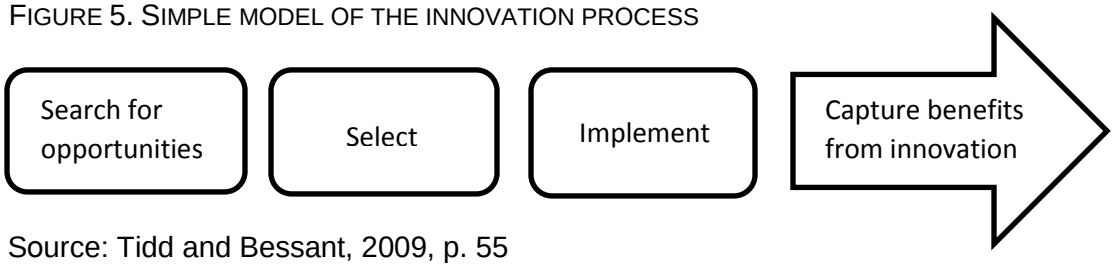
According to OECD Oslo Manual, “innovation is the implementation of the new or significantly improved product/service, or process, new marketing method, or a new organizational method in business practices, workplace organization or relations with stakeholders” (OECD, 2005). A critical feature of an innovation is its implementation. Implementation of a new or improved product or service means introducing it on the market. New processes, marketing methods or organisational systems are considered as implemented when they are put into actual use in company’s operations.

Four types of innovations are distinguished by the Manual and drawn out of the definition. They include product innovation, process innovation, organisational innovation and marketing innovation.

By definition, innovations must have a certain degree of novelty. There are three identified concept for the novelty of innovations. Innovation must be new to the company, new to the market, and new to the world. (OECD, 2005)

It is very often happens that innovations and mistaken with inventions, which are just a starting point of innovation process. The process of applying ideas into real use and capturing value from them is represented in a simple model of innovation. The model has four key stages presented in Figure 5.

FIGURE 5. SIMPLE MODEL OF THE INNOVATION PROCESS



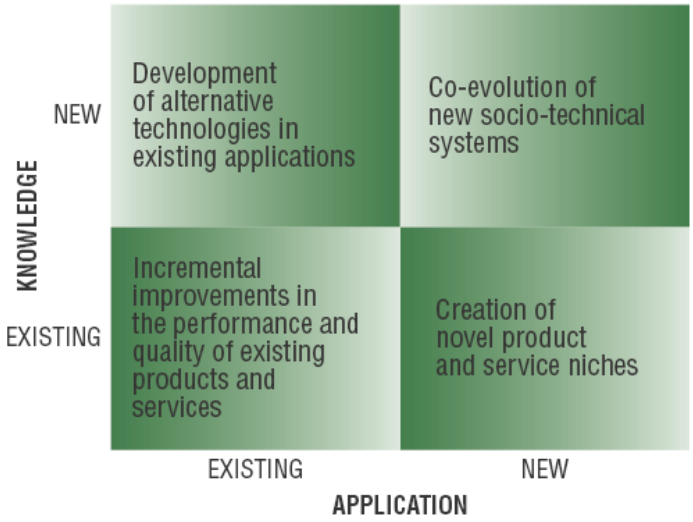
Source: Tidd and Bessant, 2009, p. 55

Political and social concerns about the ecology and sustainability present critical impact on the rate direction of innovation. The most conventional approach to innovation and sustainability concentrates on how to influence the development and application of innovations via regulations and control. Formal policies such as systems of regulation, targets, incentives, and punishments are used in order to direct innovations. A more effective approach attempts to understand how technology, markets and society co-evolve together. This perspective requires better appreciation of how firms and innovation work. It emphasizes

the need to better understand all the actors involved – the policy-makers, consumers, companies, institutions and other players.

Innovation can be a solution to environmental, social or cultural problem. Below sustainable innovations are classified taking into account type of knowledge and application of ideas into practice. Integration of knowledge and implementation gives four variations of sustainable innovations possible.

FIGURE 6. A TYPOLOGY OF SUSTAINABLE INNOVATIONS



Source: Tidd and Bessant, 2009, p.581

Lifestyles, needs, consumption patterns in especially developed countries are the main cause of resource depletion, biodiversity extinction, climate change, waste increase and overall high level of footprint. All those issues together with social inequality and poverty call for change by encoding sustainability development idea in the core of the businesses, society, governments.

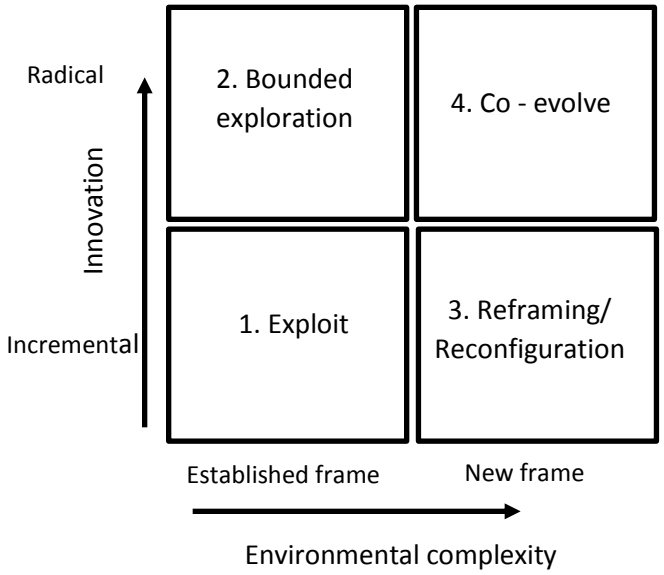
The scale on which change is required is also leading to talk about a systems level shift. The consequence of socio-economic pressures and enabling technologies is an emerging another long wave of innovation. The opportunities opened up for “doing what we do better” and “doing different” make it increasingly significant item in strategic planning among progressive organizations of all sizes.

Seebode et al. (2012) in their work on managing innovation for sustainability suggest that sustainability-led innovation highlights the issue of dynamic capability in a way that it forces

firms to adopt new approaches and release old ones around the core search, select and implement questions. Sustainability-led innovation involves working with various knowledge components – new technologies, new markets, new environment or regulatory conditions. For dealing with this, firms need capability to acquire, assimilate and exploit knowledge and to work at systems level.

Managing system-level innovation part emphasizes the importance of systems level of innovations. Innovation involves rather a bundle of knowledge brought together into an arranged combination. Henderson and Clark (1990) claim in order to manage innovation successfully we can seize and use the knowledge about components and also how they can be put together. This is so called the architecture of innovation. In case of SLI where a systems level view is required this becomes particularly relevant. Seebode et al. developed map of innovation space.

FIGURE 7. MAP OF INNOVATION SPACE



Source: Seebode D., Jeanrenaud S. and Bessant J. (2012) p. 198

System-level innovation goes beyond reviewing the link between a specific product and the environment. It rethinks the way people produce and consume imagining new results and understanding and leveraging the interdependencies of the systems' elements. Such types of innovations often imply collaboration between a broad range of private, public and civil

society actors. Such innovations have positive impact on social and environmental aspects and really enhance life rather just diminish negative influence.

The history of innovation studies for sustainable development can be interpreted as a process of linking broader analytical frameworks to consequentially larger problem framings (Smith, et al. 2010).

2.1.3. SUSTAINABILITY ORIENTED INNOVATION

There are myriad of terms of innovating for sustainability such as sustainable development innovation, sustainable innovation, CSR-driven innovation, sustainability-related innovation, and sustainability driven innovation. Authors find sustainability oriented innovation the most suitable because it is perceived rather as a process or direction toward sustainability. (Klewitz and Hansen, 2013)

The most cited definition of sustainability-oriented innovation is provided by Erik G. Hansen and Friendrich Grosse-Dunker in Encyclopedia of Corporate Social Responsibility. They define sustainability oriented innovation as the commercialized new or considerably improved product, product-service system, or service that results in environmental and/or social benefits over the initial version's physical life-cycle. There is difference between already established organizations in which SOI is considered a critical concept for the conversion of an organization's offerings and new firms or start-ups. In later, the concepts of ecopreneurship, social entrepreneurship, and sustainable entrepreneurship is underlined in order to spur sustainable development. Key issue regarding SOI is that it is linked to "directional risks", as the direction of environmental and social impacts of innovation are highly uncertain, especially in long-term. Therefore the term " sustainability-oriented innovation" stresses that sustainability is not a final point but rather a direction which correlates with risks. Article contains further analysis regarding innovation outcomes and innovation processes. The target dimension and the life-cycle dimension specify the outcomes of SOI.

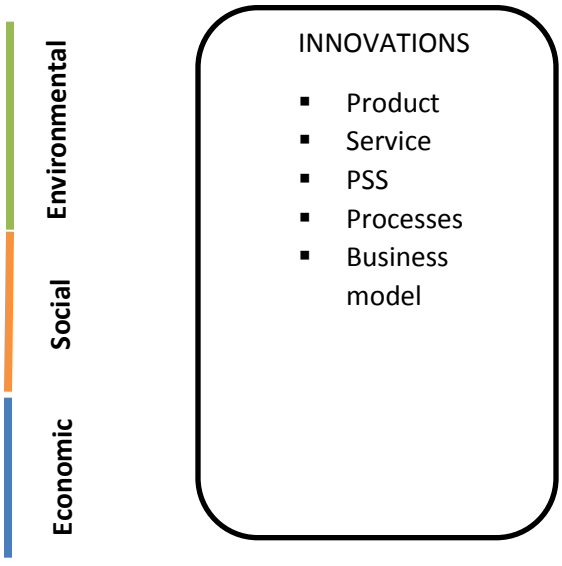
Nobre et al. (2012) combined Hansen et al. and Wagner & Llerena works and defined SOI as a new development and commercialization of a product, technology, service, process, or business model which, in comparison to an previous version. It has a positive net effect on the overall capital stock (economic, ecological and social). That means tradeoffs between

economic capital on one side and environmental and social capitals on the other are possible only when the reduction in one type of capital is balanced with a sufficient increase in the other.

Bos-Brouwers defines sustainable innovation as innovation where the renewal or improvement of products, services, technological or organizational processes apart from delivering an improved financial performance, also enhances environmental and social performance how in short so in long term. Sustainable innovation takes stakeholder view into decision-making process and aims at a transformational change of current practice. In general, sustainable innovations are deemed to be radical and transformational by nature. Therefore, not every innovation is sustainable, because not every innovation combines economic, social and environmental aspects all together. That is main distinction between traditional innovation and sustainable innovation. (Bos-Brouwers, 2009)

Concluding from all above, SOI integrate economic, social and environmental considerations into innovation practices and their core business operations and relations. The definition can be portrayed in a Figure 8 below.

FIGURE 8. INNOVATIONS WITH INCORPORATED TBL



Wagner and Llerena (2008) question whether SOI is a special type of innovation in a qualitative meaning or it is just a “better managed innovation”. Adams et al. (2012) say SOI and conventional innovation have a lot in common. They both address technological change

and include evolutions in practices, processes and business models. However, as sustainability orientation integrates environmental and social dimensions together with economic, it brings new challenges. Along with a progress, sustainability oriented innovation requires a set of integrated thinking dimensions. Capabilities, knowledge management, stakeholder relations, culture and leadership must be reconsidered again.

2.1.4. SOURCING OF SOI

SOI might have its origin from new product development, thus in a product innovation perspective, however SOI covers also process and organizational innovation. An additional type of innovation emerged for leveraging SOI is product-service systems (PSS). Product-based services and result-oriented PSS are considered to be function innovation. Instead of concentrating on how to improve the product, function innovation focuses on how product's function is best performed. All types of function innovation need to adapt to a varying degree of firm's business model. Thus it is often mentioned about business models innovation which is a very important outcome of SOI.

The creation of the innovative organization or an innovation culture is another issue of innovation management. This issue heavily impacts the development of SOI. Adams et al. (2012) describe this process as the second stage on SOI, the organizational transformation. It follows operational optimization related to SOI and precedes systems building context.

SOI poses new challenges for innovation management and the related innovation processes already in the early stages of the process. Among them is also the integration of external knowledge, interaction with stakeholder groups and the nursing of SOI culture. For further development of SOI, sustainable entrepreneurship is one of the challenges to be faced (Hansen and Grosse-Dunker, 2013).

To better inform corporate decision makers about how to minimize the directional risk of SOI, Hansen at al. present a generic model named "Sustainability Innovation Cube" (SIC) for structuring innovations' sustainability effects. It involves three dimensions: target, life-cycle and innovation constitute. The target dimension includes three assessment criteria of innovations' effects: economic effects, ecological and social. Major faces of life-cycle dimension are manufacturing, use and end-of-life phase. Considering the process of fulfilling

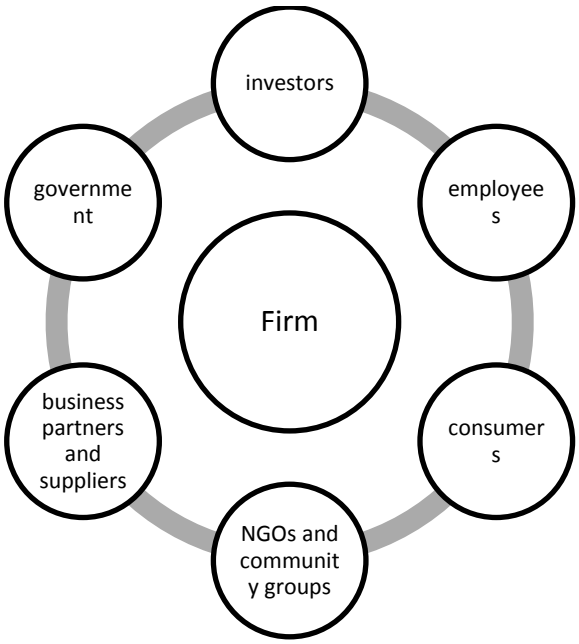
customer needs three types of innovation can be identified: technological innovations or product innovations, product-service systems innovations and business model innovations.

In combination the SIC model is a meta-method which guides companies to the right choice of assessment tools. It is a generic framework which illustrates all major sustainability effects of product innovations, however not taking into consideration immaterial products and services.

2.1.5. STAKEHOLDER THEORY IN SOI CONTEXT

Stakeholder theory suggests that the purpose of the business to create value for stakeholders. To achieve success and be sustainable over long-term, management team must take into consideration interests of customers, suppliers, employees, communities and shareholders. Stakeholder theory goes back to the Freeman's seminal work (1984), who build a new conceptual model of the firm. According to this model a firm must address the interests of its stakeholders – groups and individuals who can affect or are affected by company's operations.

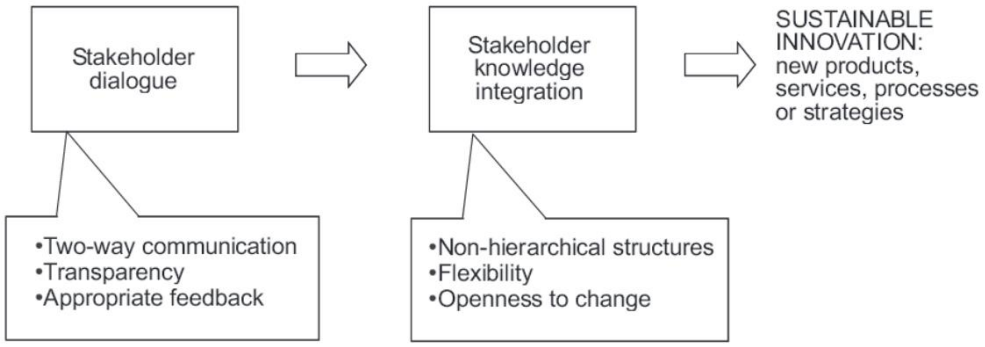
FIGURE 9. STAKEHOLDERS' MODEL



Strong long-term relationships with stakeholders can lead to a sustainable competitive advantage in form of trust, reputation and innovation. Ayuso et al. (2006) by taking an exploratory approach linked stakeholder dialogue together with sustainable innovation. They view stakeholder dialogue as one of the firm's capabilities that lead to sustainable innovations. Values and structures or systems were identified as variables explaining firm's capabilities connected to sustainable innovation. Stakeholder dialogue – a capacity to interact with stakeholders and access their knowledge and stakeholder knowledge integration – a capacity to absorb the insights from stakeholder dialogue and translate it into innovative products and operations are regarded as the capabilities needed to capture knowledge from stakeholders and transform it into innovative services, products, strategies and processes.

The multiple communication channels built with stakeholders give the opportunity for the firms to benefit from creative and practical ideas and skills that is crucial for developing sustainable innovations. Additionally, the firms' structures and systems that foster innovation portray certain features important for integrating knowledge of stakeholders. Non-hierarchical structures that favor direct communication and proximity between people.

FIGURE 10. DYNAMIC CAPABILITY UNDERLYING SUSTAINABLE INNOVATION



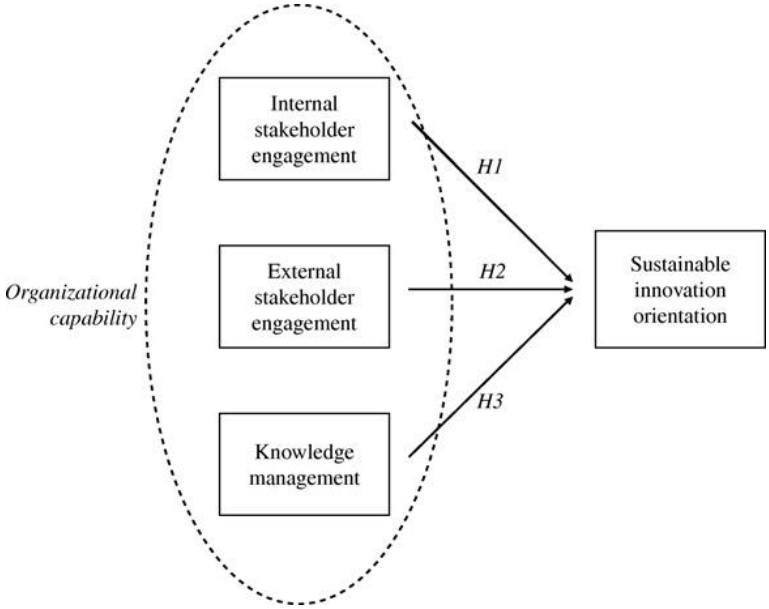
Source: Ayuso et al. (2006)

Managing collaborative relationships with wide range of stakeholders and being able to effectively channel the knowledge assets gained into the innovation processes ensures a high organizational performance for a firm.

Further, Ayuso et al. (2011) combining the insights of stakeholder theory and resource-based view approach, concluded that stakeholder engagement and knowledge management are relevant constituents of an organizational capability that deals with stakeholder-related

innovation in the context of sustainability. Empirical study proved quantitatively that the knowledge sourced from engagement with different stakeholders contributes to a firm's sustainable innovation orientation. In order to make a use of that knowledge and covert into new ideas for innovation, it has to be managed internally. Knowledge management and organizational learning are considered essential organizational competencies for facing CSR challenges. In order to facilitate the access and transfer of relevant stakeholder knowledge companies that pursue sustainable innovation have to embody KM structures and systems that rely upon matrix structures, flexibility and openness to change.

FIGURE 11. STAKEHOLDER-RELATED INNOVATION IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT



Source: Ayuso et al. (2011)

Sustainable innovation is framed as an organizational capability which combines the ability of the organization to establish strong interactive relations with the stakeholders and the capability to handle the acquired knowledge from stakeholders and transform it into social and ecological innovations. There is evidence that stakeholder engagement and knowledge management are two linked capabilities that influence sustainable innovation. The level of development of those sub-capabilities is contingent on the industry sector of the firm. High knowledge intensity and high visibility happen to be the most favorable factors for developing such organizational capabilities.

2.2. IMPLEMENTATION OF SOI INTO CORE BUSINESS OPERATIONS

Countless amount of frameworks (Baumgartner, 2013; Marrewijk and Hardjono, 2003; Hansen, et al. 2009) exist in the literature identifying essential constituents leading to the sustainable company. Petrini and Pozzebon (2010) took more practical approach and explored how exactly sustainability is incorporated into business practices facilitated by identified factors. Among those factors influencing effective integration of sustainability into organizational practices are distinguished: leadership, governance, communication and training, reporting, lower level commitment, stakeholder pressure. The model presented in Figure 12 depicts interaction between the factors and enhances integration of sustainability and social responsibility into business practices. The model identifies a group of institutional factors that serve as drivers of such integration. The model includes three broad categories: corporate view, organizational structure and organizational mechanisms.

FIGURE 12. CONCEPTUAL MODEL OF THE INTEGRATION OF SUSTAINABILITY INTO BUSINESS PRACTICES

Source: Petrini M. and Pozzebon M. (2010), p. 369

Starting point is commitment of the top management towards sustainability. This high-level engagement enables changes in the organizational structure that put the sustainability outlook into action through new or adapted governance structures such as committees and commissions. Top-level commitment acts as a promoter of the sustainability vision, allowing the emergence of sustainability leadership at different organizational levels. Leadership is

reinforced by formal sustainability area within the organizational structure. Finally, corporate view and organizational structure foster implementation of a set of organizational mechanisms. Those mechanisms legitimize and consolidate the integration of sustainability by clearly defining the role of sustainability within the firm; launching educational program; embedding clear mechanisms for communication and monitoring; initiating a system of recognition and valorization of sustainable practices.

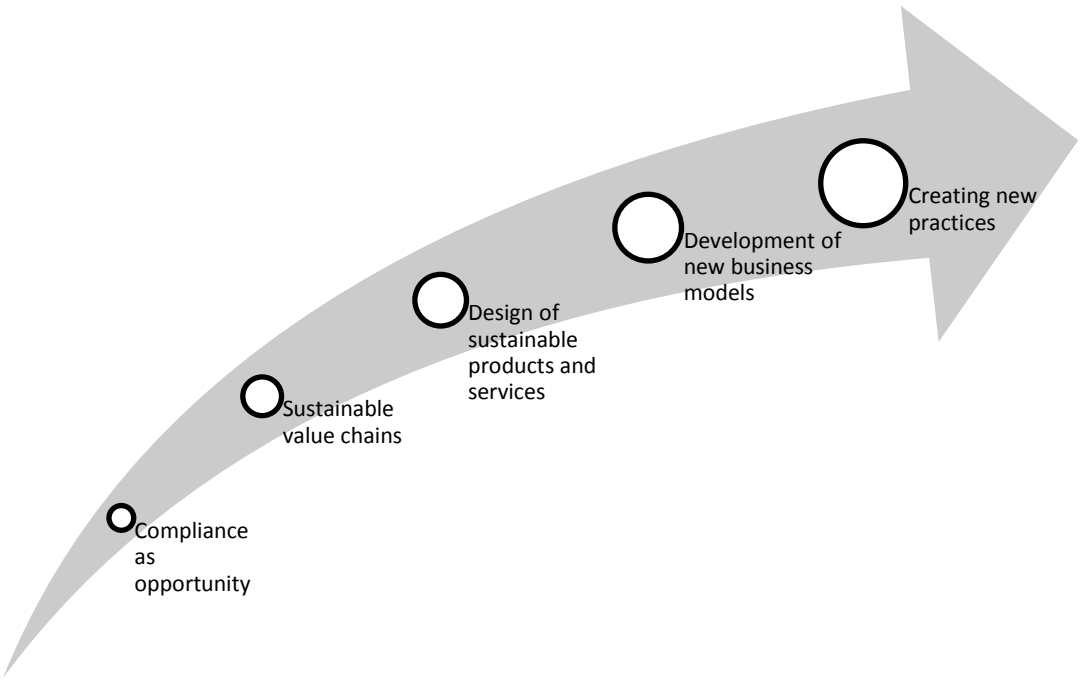
2.2.1. KEY DRIVERS OF SOI

Sustainability is an abundant source of organizational and technological innovations that yield both bottom-line and top-line returns. Smart companies now address sustainability as innovation's new frontier. In the future, only companies that make sustainability a goal will achieve competitive advantage. That implies rethinking business models as well as products, technologies and processes. Such companies pass through five distinct stages of change. Viewing compliance as opportunity as in the case with HP's European Recycling Platform. Companies in the leading positions of compliance recognize business opportunities earlier than others. Second stage in the journey is making supply chains sustainable. Once companies have learned to abide with regulation, they become more proactive on sustainability issues. Operational innovations are central to building a sustainable supply chain. Operational innovation leads to greater energy efficiency and reduces company's dependency on fossil fuels. Central challenge for designing sustainable products and services, stage third, is to develop sustainable offerings or improve existing ones to become eco-friendly. Developing new business models includes novel ways of capturing revenues and delivering services in tandem with other companies. Developing a new business model requires searching alternative ways of running business together with understanding how companies can meet high customer expectations. The last stage crowning the progress towards sustainable business is creating next practice platforms that will break traditional thinking and lead to radical innovations.

Two enterprise wide initiatives help companies to turn to sustainable practices. Support and promotion of social and environmental issue among top management aids into faster and more effective dissemination of change into all levels of the enterprise. Secondly, nowadays engagement into corporate responsible actions and environmental commitment attracts

talented and skilled workforce to such companies. Therefore creating competitive advantage in term of satisfied and creative employees over other rivals. In short, leadership and talent are crucial in development of sustainable economy. (Prahalad et al. 2009)

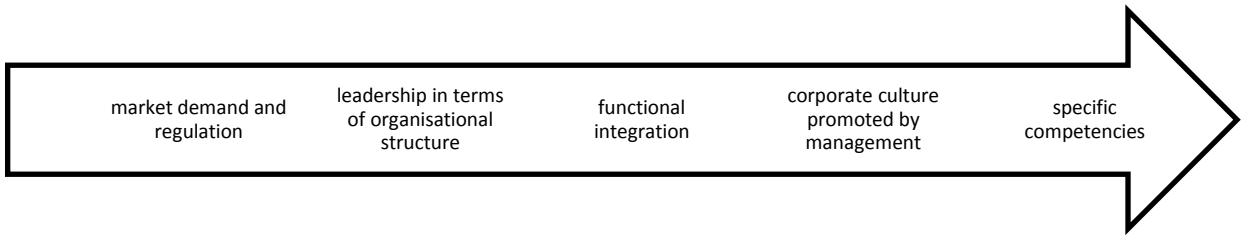
FIGURE 13. FIVE STAGES FOR BUSINESSES TO SUSTAINABILITY



Source: based on Nidumolu R., Prahalad C.K. & Rangaswami M.R. (2009)

Wagner and Llerena (2008) analysed the role of environmentally and socially beneficial innovations and the integration of sustainability aspects with corporate strategy in private firms as critical factors for sustainability leadership. They found that market demand is a pivotal factor that limits or pushes suppliers in B2B contexts towards leadership for sustainability. As well regulation is identified as an enabling factor for sustainability-related innovation. Also their research revealed that sustainability-related innovation is fostered by board responsibility and formal as well as informal integration of sustainability aspects in processes. Sustainability-related innovation is often a bottom-up activity according to the authors. Summarized drivers for sustainability-related innovation based on case studies across developed countries are presented below in Figure 14.

FIGURE 14. FACTORS FOSTERING SUSTAINABILITY-RELATED INNOVATION

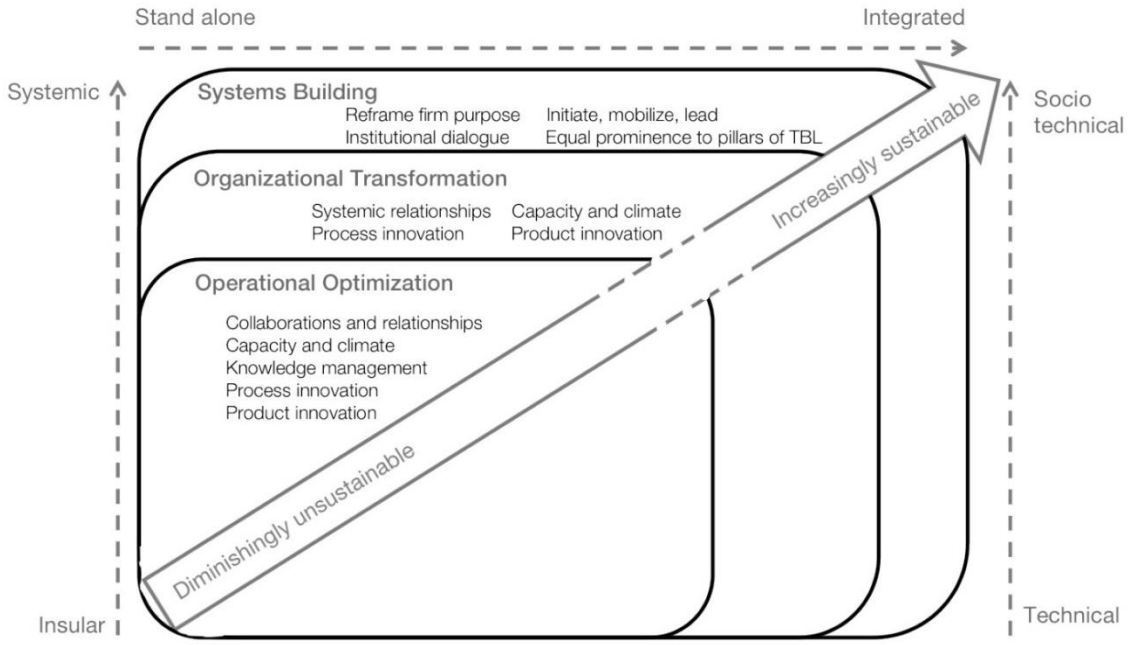


Source: Adopted from Wagner and Llerena, (2008).

Epstein (2008) presents four main reasons, or drivers, why sustainability is important. First, regulations and codes of conduct require that companies must increasingly address sustainability issues. Noncompliance with regulation causes high costs to bear. Second reason is that general public and activist NGOs are becoming aware of sustainability and the impacts of corporations on society and ecology. Therefore managing community relations is very critical for companies to run business and save good reputation. Enhance revenue and lower the costs is another factor to consider when managing sustainability. Sustainability can create financial value for businesses. Finally, societal and moral obligation concern triggers integration of environmental and social aspects into the practices. This perspective represents rather reactive or passive approach to sustainability.

Adams et al. (2012) carried out a systemic review identifying activities that companies should be engaged in to adapt their innovation systems to drive sustainable outcomes. SOI is viewed thus from two opposite perspectives: SOI as taking small incremental steps in the right direction and the need for radical systemic transformations. Resting on those views model was developed incorporating different contexts of SOI and innovation activities that firms are doing in particular background.

FIGURE 15. CATEGORIES OF INNOVATION ACTIVITY IN THE THREE CONTEXTS OF SOI



Source: Adams et al. (2012)

Based on the review of the previous academic models of SOI the authors development a three contextual and dimensional framework. Operational optimization represents and incremental shift by gradual improvements. In this context firms seek to lessen the harmful impact of their business operations. Systems building in contrast reflect a strategy looking for being more sustainable and have a net positive impact rather than being less unsustainable. System Builders are those experimenting with their business models, enhancing broader institutional change and alternative ways to deliver products and services. The bridge between those two contexts is an organizational transformation phase during which firm's innovations become more systemic, integrated and socio-technical. The framework was created for companies to benchmark innovation activities and find its position in the model. It was assumed to serve as a help in order to move along the line towards sustainability.

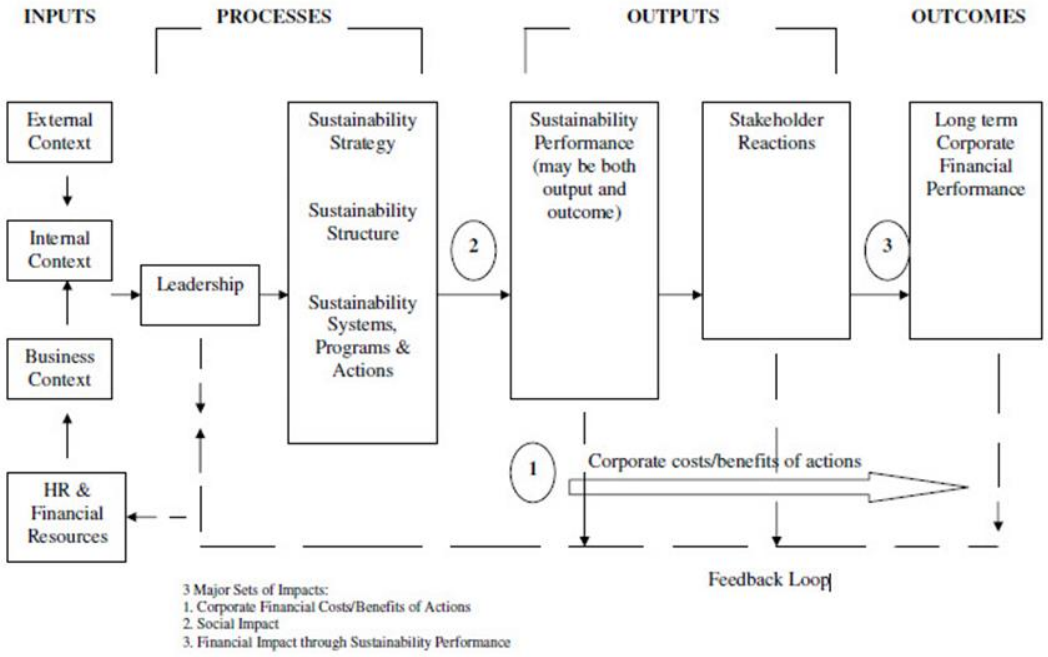
2.2.2. BUSINESS MODELS AND SUSTAINABLE INNOVATION

Although there is a lot of literature on frameworks and sustainable strategies and challenges, understanding of sustainable business models and how sustainability is operationalized is still

in embryo state. A coalition led by Erasmus University developed the European Corporate Sustainability Framework which presents a set of models, tools and theories. The ECSF aim was to help organizations address complex social and environmental sustainability issues. (Hardjono & Klein, 2004).

Epstein (2008) in his book introduces a model or framework to help companies in identifying, measuring, and integrating social and environmental impact into corporate strategy and management decisions. The corporate sustainability model explains how various inputs and processes affect sustainability performance and stakeholder's reactions. The later affect long-term corporate financial performance and are a part of a business case for sustainability.

FIGURE 16. CORPORATE SUSTAINABILITY MODEL



Source: Epstein (2008)

Schaltegger, et al. (2011) argue that to support systemic, continuous creation of business cases for sustainability requires change of the business model. The business model is a strategic asset to improve firm performance. It may determine a leadership agenda on strategic business model management and innovation.

Business model innovation might be a key to create a strategic leverage effect. Founded on understanding of a business case for sustainability, a business model for sustainability is defined as supporting voluntary activities which solve or mitigate social and environmental

problems. A business model for sustainability is actively managed to create customer and social value by integrating social, environmental, and business practices. An integrated framework of the business case for sustainability was developed based on sustainability strategies, business case drivers, and business model. Thus, the authors have distinguished between defensive strategies with small degree of business model adjustment or adoption, accommodative strategies which go along with a change and some improvement of business model, and proactive strategies leading to actual business model redesign. (Schaltegger et al. 2011)

Stubbs and Cocklin (2008) discuss sustainable business models as an expression of organizational and cultural changes in business practices and attitudes. They take perspective that organizations will only be sustainable if the neoclassical model of the firm is transformed by social and environmental priorities. Their "sustainability business model" draws on economic, environmental and social aspects of sustainability in defining an organization's purpose and also encompasses the systems perspective as well as the firm-level perspective. SBM requires that organizations treat sustainability as a business strategy rather than an additional line of work.

Sustainable business model incorporates a triple bottom line approach and takes into consideration a wide range of stakeholders' interests together with environment and society. They are essential in driving and enforcing corporate innovation for sustainability. Sustainable business models can help embed sustainability into firm's purpose and processes and be a key driver of competitive advantage. Organizations can progress significantly towards sustainability using their internal capabilities. However the whole system which companies are part of must be sustainable. To facilitate firm-level and system-level sustainability, changes to socioeconomic system, both structural and cultural are required. (Stubbs and Cocklin, 2008)

There is a need for fundamental shift in the purpose of business and almost every aspect of how it is carried out. Business model innovation offers a potential approach to bring the change via re-conceptualising the purpose of the organization and the value creating system, and the rethinking perceptions of the value. Stubbs and Cocklin (2008) and Porter and Kramer (2011) suggest that with careful business model redesign, mainstream businesses will be ready to integrate sustainability into their operations and new start-ups to design and pursue sustainable business from the beginning.

Bocken et al. (2013) collated the examples of mechanisms and solutions that can contribute to business model innovation of sustainability and analysed to identify patterns and attributes based on sustainable business model archetypes. The study provides an approach for linking the theoretical concept of business model innovation to the practical transformation mechanisms emerging to deliver industrial sustainability. The purpose of categorization is apart from reducing social and environmental negative externalities, also assisting in fundamental rethinking the business model to sustainability direction.

Eight sustainable business model archetypes were distinguished. They concerned maximization of material and energy efficiency, value creation from waste, alternatives to energy production such as renewables and natural processes, increased functionality instead of ownership, adoption of a stewardship role, encouraging efficiency, change of the purpose of the business for society/environment and development of scale-up. Those archetypes are envisaged to assist in exploring new ways to create and deliver sustainable value and developing the new sustainable business model structure.

Boons et al. (2013) propose that sustainable business models have the potential to link radical and systemic sustainable innovation and forms strategies, including the issue of economic performance at various levels. They review the business model of Boons and Leudeke-Freund (2013) in the sustainability innovations context. Through core components of business model: the value proposition, the configuration of value creation and the revenue model are highlighted three aspects that are crucial for sustainable innovation.

Taking practical approach, CERES (2010) designed the roadmap as a practical guidelines for companies to place sustainability at the epicenter of their business model. The paper lays out four broad areas of activity that companies should focus on. Those areas include governance, stakeholder engagement, disclosure and performance. In the roadmap, CERES presented an integrated approach for embedding environmental and social concerns in the corporate DNA.

2.2.3. SHARED VALUE CREATION

Value proposition is one of the constituents of the business model of the enterprise. However economic value narrows down only to satisfactions of shareholders and does not consider

social and environmental aspects which could open up new business opportunities and face sustainability challenges. For that managers must understand how to directly link company sustainability to the creation of shareholder value. Hart and Milstein (2003) argued that if viewed via the appropriate set of business lenses, the global sustainability challenges can help to identify strategies and practices that address the sustainability drivers and at the same time drive shareholder value. That defines the creation of sustainable value for the firm. Based on that view, they develop the sustainable value framework which combines both shareholder value and sustainability challenges and transforms is to the opportunities for enterprises to create sustainable value for shareholders.

Despite recommended pursuit of sustainable value, the focus is still on creating shareholder wealth considering sustainability challenges as business opportunities. The view draws on outdated approach to value creation and does not foresee systems change.

The concept of the shared value, introduced by Porter and Kramer (2011) questions capitalistic mindset and requires a shift from neoclassical model to a new way of business thinking and behaving. The concept of shared value resets the indicated borders of capitalism.

The principle of shared value involves creating economic value so that it also creates value for society by meeting its needs and challenges. Shared value directs companies on the right kind of profits meaning profits creating social benefits.

The purpose of the corporation must be redefined from just generating profit to creating shared value. This transformation will “drive the next wave of innovation and productivity growth in the global economy”. Shared value should be in the center of what companies do. It is not CSR, or even sustainability, but an alternative way to achieve economic success by reconnecting it with social progress. In consequence such connection of business and society opens up different ways to serve new needs, gain efficiency, create differentiation, and extend markets. (Porter and Kramer, 2011) Creating shared value entails embedding a socail mission in the corporate culture and channe.ling resources needed to develop innovations oriented to solve social issues. Three ways were identified in which shared value is possible to be created. It is portrayed in the figure below.

FIGURE 17. WAYS TO CREATE A SHARED VALUE

Source: Based on Porter & Kramer (2012)

Following the idea of innovating to meet society's needs and at the same time gain profits Pfitzer, et al. (2013) analyzed the activities of few international leader companies aiming to implement the shared value concept in their businesses. Five mutually reinforcing elements were identified as a cornerstones to achieve twin goals of social and business value. The optimal form and balance of those five constituents are contingent upon a firm's culture, context and strategy. Thus, industry leaders and pioneers are making significant progress in an attempt to turn the pursuit of shared value opportunities into a regular practice. It requires defining a clear social purpose, advertising it within and outside the firm and embedding social purpose in core processes of the company – strategy planning and budget. This creates a culture and spurs a commitment and genuine interest of employees and mobilizes external stakeholders with similar goals. Managers should relentlessly depict and measure the quantity the business threats and opportunities. In order to embed social purpose into organizational culture, social needs and problems must be defined. The sole for changes must be well prepared by conducting a research to have a comprehensive view on the problem, number of people affected, the obstacles to progress, öptions for drjving change, and the partners that can help. Thirdly, companies need to be able to measure shared value by anticipating how an extent of social conditions' change will drive profits and matching the

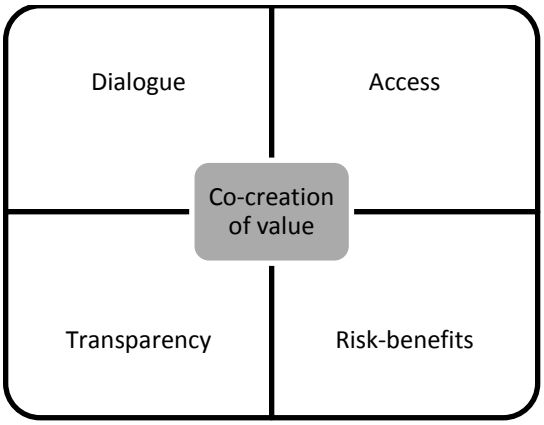
bendefits to the resources needed to gain them. In turn the extent to which the potential for shared value can be assumed and aligned with the financial criteria of the company defines the optimal innovation structure for social enterprise. Last but not least element is the deep collaboration and involvement of external stakeholders into problems identification and design and implementation of solutions – co-creation.(Pfitzer et al. 2013)

Co-creating with main stakeholders is nowadays an approach spreading throughout the business circles. The interaction between the company and the clients is becoming a central point of value creation and extraction. The meaning of value and the value creation process are shifting from company-centric view to customer personalized experiences. Co-creation is about joint creation of value by the firm and the customer, allowing the client to co-construct the service experience that takes into account his/her personal context. It is also joint definition of the problem and finding solutions to it. What is needed to be created is an experience environment within which individual consumers can make their own unique personalized experiences. Therefore, products can be commoditized however co-creation experiences – not.

Communities of connected, informed, empowered and active customers are co-creating values with the companies. They can choose the firm based on their view of how value should be created. (Prahald & Ramaswamy, 2004) The advent of Web 2.0 triggered the involvement of consumers into the innovation process of the large companies. On-line tools allowed to create own content and share it worldwide. “Empowered consumers” are a new type of consumers who strongly believe in their own creativity, ideas and self-expression. However the active consumers must be identified first. In reality, only top 1% willing and able to jump through serious barriers and co-create with the firm. Better understanding of dedicated and active consumers allows companies to see what types of innovations can be done more effectively and together with which customers in online and offline environment. Thus a firm by embracing leading-edge users into their operations on a continual basis via a range of tools benefit from new ideas, product designs, marketing tactics and a positive word of mouth.(Medeiros & Needham, 2009)

Building blocks of interactions between consumers and companies facilitates co-creation experiences. Dialogue, Acess, Risk assessment, Transparency are the main building blocks of co-creation.

FIGURE 18. BLOCKS OF CO-CREATION



Source: Prahald and Ramaswamy (2004)

Dialogue implies interactivity, deep engagement, the ability and willingness to participate from both sides. Only equal partners are able to perform a dialogue. Also access to the information from community as well as from the firm and transparency of operations is vital to have a fruitful dialogue. In consequence all three elements: dialogue, transparency and access allows the customer to assess risk-benefits of the particular action or decision.

As the transformation of the value towards experiences occurs, the market is becoming a platform for conversations, interaction and discussions between consumer communities and companies. Co-creation converts the market into a forum where a consumer, a company, a community of consumers and network of firms participate in a dialogue.(Prahalad and Ramaswamy, 2014)

Leavy (2012) in his masterclass discusses three tools for collaborative innovation among various stakeholders being active in value creation process: design thinking, value co-creation and the power of the “pull”. Design thinking is related closely to integrative thinking which includes the capacity to exploit opposing ideas and constraints in the developing new solutions. In terms of design, that means balancing desirability, technical feasibility and economic viability. After companies made a transition to design thinking, users should be empowered as main collaborators. A critical element of the transition to co-creation is the ability to develop and manage effective two-way communications and information systems.

The “power of pull” expresses the idea of moving from “push world with mass production system towards an operating model based on the “pull” principle. Following this principle organizations need to learn how to “pull” together and mobilize the resources to face

demands of active and engaged customers. The pull principle operates on three levels: access people and resources when needed, attract them to us and the ability to pull from within the insight and performance required to fully achieve the potential. As co-creation and design thinking so the transition to the pull power is an evolutionary process beginning from individual imitativeness with a foresighted leadership accelerating and broadening the process towards final shift unleashing institutional innovation.

Gouillart (2014) goes further and offers a view on the reasons why co-creation with various actors is becoming a cornerstone of the creative economy. He suggests how the most popular approaches help companies to gain a competitive advantage via connections that enable continuous innovation. Five processes must be adopted in co-creation in order to tackle complex issues. That is community, platform, interactions, experience-base and economic value which are integrated in a different ways in all initiatives designed to promote stakeholder engagement.

Five archetypes of co-creation model are distinguished to involve stakeholders in the process of product or service innovation and learning. Community or social marketing, design thinking or user-centric design, co-creative transformation, crowd-sourcing and open innovation are methodologies of co-creation model that contribute to creating competitive advantage. Each of the methods adopted by a company is a step to right direction, however leading companies should bolster more experimentation on the road towards eco-system co-creation.

2.2.4. SUSTAINABLE INNOVATIONS IN SMALL AND MEDIUM-SIZED ENTERPRISES

The size of the enterprise is one of the important influence on the particular ways in which innovation is handled. Typically smaller companies have a range of advantages such as flexibility and fast decision making. However, SMEs equally have limitations such as resource shortages and focus on short-term strategy. Thus, developing effective innovation management depends on creating structures and behaviors which perform to these. (Tidd and Bessant, 2009)

TABLE 2. ADVANTAGES AND DISADVANTAGES OF SMALL INNOVATORS

Advantages	Disadvantages
Speed of decision making	No formal systems for management control
Informal culture	Limited access to key resources

High quality communications	Lack of experience and key skills
Shared and clear vision	Focus on short- and medium-term strategy
Flexibility and agility	Lack of structure and succession planning
Entrepreneurial spirit	Low risk management
Enthusiasm and passion for innovation	Lack of application to detail
Networking internally and externally	Limited access to resources

Source: Tidd and Bessant, (2009), p. 61

SMEs innovation processes differ significantly from those in large companies. Policies, theories and instruments that suit large enterprises do not necessarily lead to successful results in SMEs as well. SMEs thanks or due to their specialties in matter of resources, organizational structure, management style, communication patterns and networks require another approach to implementation of SOI.

SMEs innovations can be seen as incremental, whereas sustainable innovations are by nature radical and transformational. On the other side, the SME's behavioural advantage in innovation and collaborative abilities show that they can balance the resource shortcomings. One the main advantages of SMEs over large firms is the role of the owner/manager in innovation. The sustainability orientation of the owner appears to be pivotal in the number and impact of sustainable innovation activities. A key success factor of innovation is a horizontal leadership style together with independent decision making at employee level. Also the ideas generating role of the owner is of a high importance in relation to the success of innovation process. Human capital is emphasized to be central to developing innovative projects in products, services, processes.

SMEs ability to internalize elements of innovation process and distribute their R&D efforts across various operational areas is what distinguishes them from large enterprises. In order to compensate shortage of financial and other resources SMEs have strong incentive to cooperate with stakeholders and even with competitors. Participation in innovation networks enables small firms to gain access to sophisticated technology and technological expertise. Among other motives to network are reduction of uncertainty via sharing risks and costs, gain of extra knowledge on market, serving markets abroad and establishing industry standards. In other words, "an SME is not a little big business".

In sum, the main indicators of sustainable innovation practice within SMEs are sustainability orientation, design of the innovation process, and collaboration with stakeholders to compensate resource shortage.

Flexibility of organization is another beneficial factor of SMEs. Especially in small companies little bureaucracy and informal communication cause result in efficiency, effectiveness and responsivity to changes in the commercial environment. Whereas SMEs typically have a lack of resources the more sustainable innovative find ways to overcome shortcomings by enhancing labor resources and cooperation efforts. More intense collaboration with stakeholders lead to significant increase in number and impact of sustainable innovations.

The time to fail and manager's support help employees to develop thoroughly innovative ideas together with driving force of the owner are good indicators of the number and success of sustainable innovation activities. SMEs behavioural advantages such as entrepreneurial leadership style, informal ways of communication, flexible organization capacities and motivated personnel help to compensate their lack of resources and benefit over and above large companies. (Bos Brouwers, 2010)

New technologies provide start-ups with the ability to change conventional way of doing business. (Nidumolu et al. 2009) Many sustainability-related innovations such as system- or function-oriented are carried out by rather small enterprises. This implies a significance of entrepreneurs for sustainability-related innovations. Also the relevance of start-ups for the integration of ecological products and processes is emphasized. This can be related to obstacles for incumbents when innovation is either radical in the technological or organisational terms. (Wagner and Llerena, 2008)

2.2.5. ORGANIZATIONAL COMPETENCES AND DYNAMIC CAPABILITIES

Dynamic capabilities concern "the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Teece et al. 1997). Dynamic capabilities represent one of the elements of resource-based view of the firm (Barney, 1991; Penrose, 1959; Peteraf, 1993; Prahalad and Hamel, 1990; Teece, Pisano, and Shuen, 1997)

Teece (2007) identified three categories of dynamic capabilities: sensing, seizing and transforming capabilities.

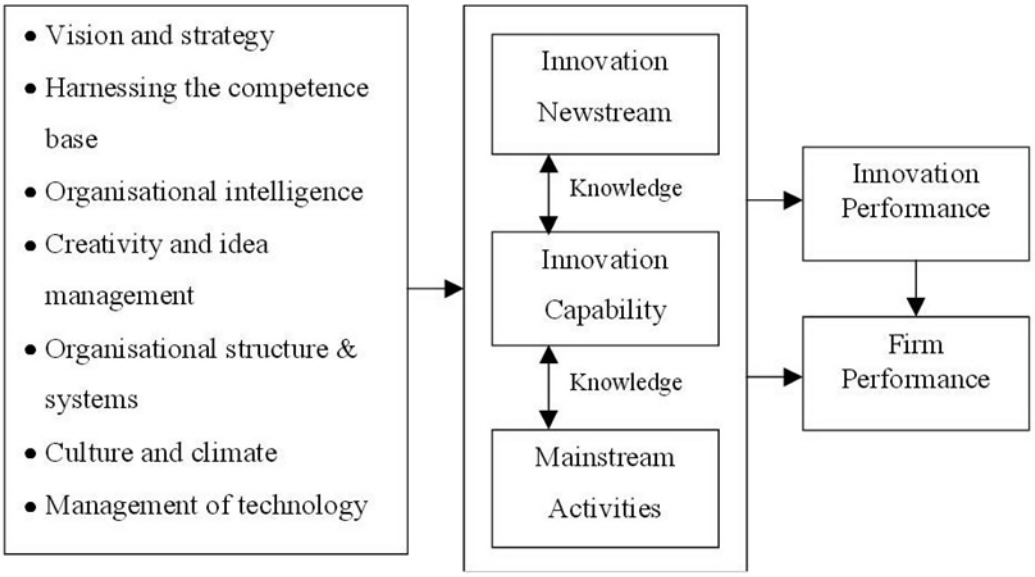
Dynamic capabilities underline management capabilities and inimitable combinations of resources that cut across all organization functions. As a key mechanism for organizational growth and renewal, innovation is central to the dynamic capabilities theory. Innovation management itself is viewed as a form of organizational capability by Lawson and Samson (2001). Capabilities are distinguished based on the type of knowledge they contain functional, integrative and innovation capability presented in Table 3.

TABLE 3. CAPABILITIES CLASSIFIED BY KNOWLEDGE

Functional capabilities	allow firm to develop technical knowledge
Integrative capabilities	allow firms to absorb knowledge from external resources + mix the different technical competencies developed in various departments
Innovation capability	higher-order integration capability – the ability to mold and manage multiple capabilities.

Lawson and Samson (2001) used innovation capability to describe the ability of high-performing innovators to achieve effective performance. Capability to innovate creates the potential for firm-wide behaviors leading to systematic innovation activities within the firm. As SOI is a systematic innovation capability may result in SOI activities as well. Innovation capability is considered from seven aspects and a model of innovation capability is presented in the Figure 19 below.

FIGURE 19. A MODEL OF INNOVATION CAPABILITY



Source: B. Lawson & D. Samson, (2001), p. 388

Organizations that consciously and explicitly develop and invest in these aspects of innovation capability, individually and collectively, have a higher likelihood of achieving sustainable innovation outcomes as the engine of their business performance.

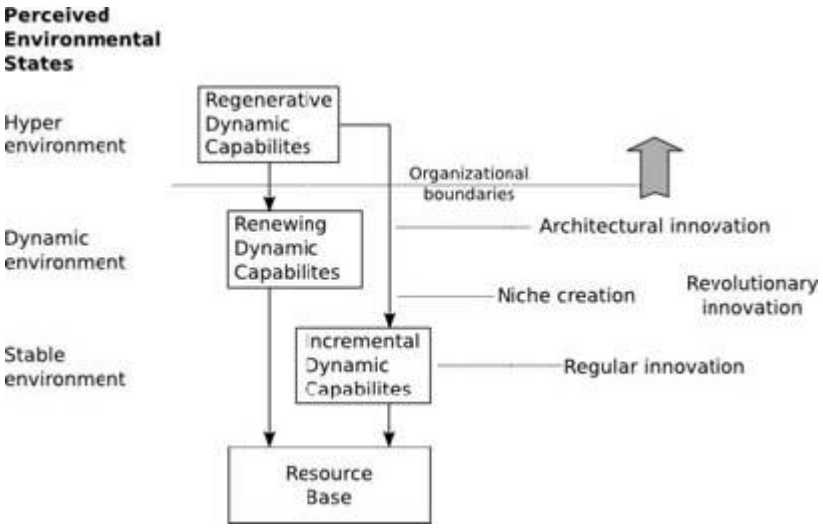
Innovation for sustainability requires multi-actor collaboration. It is more problem-oriented, involves learning and joint action and builds knowledge of context-dependency. As for problem orientation, the diversity of actors plays important role in helping in identification and specification of the issues that need to be addressed by innovation. Progress towards sustainable actions includes collective problem finding, developing future visions of more sustainable systems, and identifying the technological and other innovations needed to achieve visions. The issue identified by network of actors provides a central focus for innovation than following the technology-push model of technological innovations looking for further applications on the market. Also as sustainable innovations are determined by local circumstances and conditions, involvement from locally knowledgeable actors is required so that innovations can be adjusted to context. (van Kleef & Roome, 2007)

The authors argue that capabilities critical to develop sustainable innovation are capabilities to discover unknown options. Capabilities to discover unknown option entail the capability to think independently and inventively. Secondly, capabilities to communicate and collaborate

with very diverse networks of actors on integrating their diverse perspectives, criteria, and information processing and decision styles are crucial. Capabilities have to be able to accommodate these very diverse perspectives while operating within a multi-organizational system that is sensitive to locality. Such capabilities include ability to create and maintain trust, solve problems collectively in diverse teams, networking and to form and maintain strong relationships.

Castiaux (2012) explores the impact of new sustainability requirements on the dynamic capabilities that a company should develop and sustain to remain competitive in turbulent environments. The author combines hierarchy of dynamic capabilities and levels of innovations. The increasing complexity of innovation leads firms to go beyond the organizational boundaries to find support in complementary knowledge, calling for open innovation opportunities. Not only competences and resources have to be renewed to cope with continuously changing environments, also dynamic capabilities must be rethought.

FIGURE 20. DYNAMIC CAPABILITIES HIERARCHY AND INNOVATION LEVELS



Source: Castiaux (2012), p1240013-7

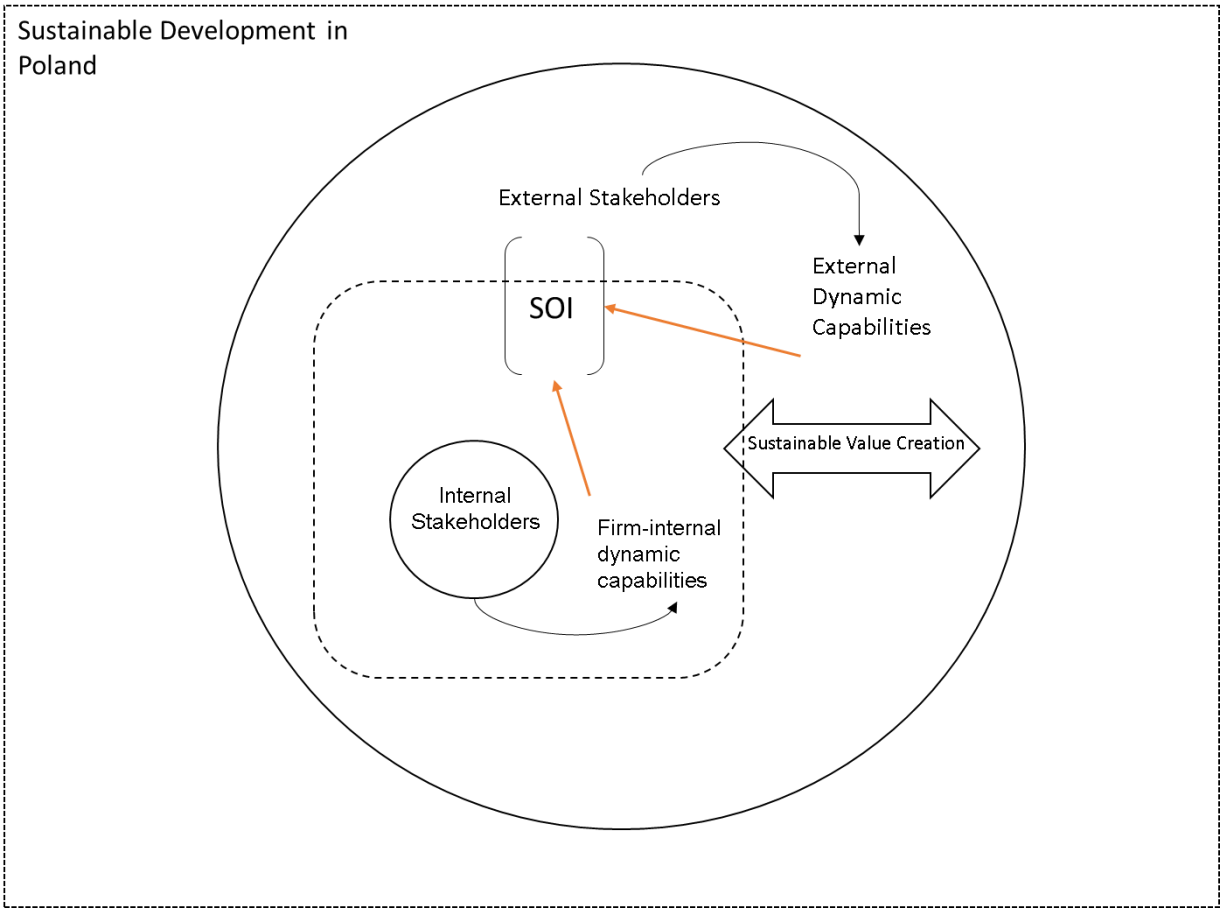
Intensity of sustainable strategy has an impact on the importance of capabilities dynamization. The more a firm integrates sustainable considerations in its strategy, the more competences, resources and dynamic capabilities are questioned. If companies want to be successful in sustainably innovative projects, they have to develop new dynamic capabilities embedding social and environmental dimensions. Especially, companies have to develop

competencies to open to stakeholders because evolution towards radical societal changes is systemic and must be supported by all participants.

3. RESEARCH FRAMEWORK

The research framework embraces main theories described in theoretical part of the Thesis. The context of the framework is sustainable development of the state. Stakeholders view is embedded inside the organization as an integral part of the strategy building of the company. External stakeholders such as regional and national government, local authorities, competitors and companies from other industries influence and simultaneously create external dynamic capabilities which in turn impact sustainability-oriented activities. The example of such external institutional factors could be market demand, NGOs pressure, and compliance to regulations. Internal or close stakeholders such as employees, business partners and customers also directly or indirectly contribute to the development of the firm-internal capabilities and sometimes are an integral part of them. Together with external capabilities firm-internal capabilities enhance sustainable value creation by company and the environment which leads to the innovations for sustainability. Visionary explanation is presented in the Figure 21 below.

FIGURE 21. RESEARCH FRAMEWORK



4. RESEARCH DESIGN AND METHODS

This chapter is dedicated to research design, the process of turning research question into a research project (Saunders et al. 2009). The methodology of the empirical part of the research is presented. The choice of the particular data collection methods is explained followed by data analysis methods used in this inquiry. Validity and reliability of the methods discuss the quality of the research and finish the chapter.

4.1. DATA COLLECTION METHODS

As presented in section 1.3, multiple methods are used in collection of the data. The study is characterized as multi-method qualitative study as qualitative data was collected using semi-

structured in-depth interviews and group study with experts in the project field. The data is analysed using non-numerical procedures. (Saunders et al. 2009) Qualitative research is conducted because we need a complex and detailed understanding of the problem or issue. The detail can only be established when talking directly to people, going to the places where they live or work and allowing them to talk without imposing any expectations of findings. The qualitative research is used in order to understand the contexts or setting within which participants address an issue. What people say is inseparable from where do they live or work. The last argument is that in some matters as sustainability or corporate social responsibility quantitative research is incapable to fit the problem and catch the linkages and relationships. Qualitative approach is just a better fit for the research objective.(Creswell, 2013)

The primary data was collected through the semi-structured non-standardized interviews. Interviews were chosen as data collection method because it is easier for people to talk than to give written answers. Also human factor in face to face interviews plays important role and helps to curry favor with the participant giving the opportunity for extended and full replies. Moreover, with interviews it is possible to collect reliable, valid, rich and detailed data that are relevant to the research objectives and questions of the inquiry (Saunders et al. 2009). In order to get as much insight as possible about the companies, semi-structured interviews were considered as the most appropriate for research. There is list of questions prepared by the project leading organization which was required to follow during the interviews. However in particular interviews some questions were omitted and modified given a specific organizational context encountered in relation to the research topic. The interview guidelines are presented in Appendices.

The selection of the case companies were based on location and availability factors. Location factor reflects the personal interest of the researcher. Request to participate in the project was sent to eleven companies operating in Poland, mainly in Warsaw. The criteria of the choice of the company is the engagement in innovative activities and sustainability oriented practices. The list of companies with best CSR practices recognized by Responsible Businesses Forum was taken as a base to selection of contacting forms. Responsible Business Forum is the oldest and biggest Polish non-profit organization promoting responsible business. Forum sets trends of responsible business and sustainable development in Poland. (Odpowiedzialny Biznes, 2015). The agreement was received from four companies: two large corporations and two small companies. It must be noticed that the

agreement to participate was given only after involvement of third parties. No direct reply took place.

The interviews of overall 7 informants were carried out in January and February of 2015. According to the requirements of the project, Director of Sustainability or CSR, Director of Innovations, Director of marketing and Director of Innovations must have been interviewed. However given the specificity of each company and its size the chosen interviewees were directors and managers and CEOs or founders of the companies. Detailed information about the study participants is presented in Table 4.

The interviews took place at the office of the company or via internet. The language of the interview was English, however with some Polish expressions or words which were translated later by researcher with a help of on-line dictionaries. The interviews were audio-recorded with prior requested permission. The overall duration of the interview is 2 hours depending on the broadness and preciseness of the answer. The interviews were consequently transcribed and then coded. Codes were derived from the data based on the actual words or terms used by the interviewees or by summarizing the concepts discussed by the respondents into themes.

Secondary data were collected from publicly available reports, internal company documents, Web sites, and internet news.

TABLE 4. INFORMATION ON PARTICIPANTS

Company	Position	Year of foundation	Number of employees	Sector	Legal form of business
Laboratorium EE Sp. j.	Founder/CEO	2010	34	IT, software, services	Registered partnership/ general partnership
Laboratorium EE Sp. j.	Comunication and Marketing Director				
The Sustainers Sp. z o.o.	Vice-CEO	2012	2	Consulting services, ICT	Limited liability company/ Private company

Orange Polska S. A. CBR	Director of Research and Development Center	1991	350	Research and development in the field of navigation technology, transport and telecommunications	Joint stock company/ Publicly held company
Orange Polska S.A.	CSR Specialist	1991	20 539	Telecommunications	Joint stock company/ Publicly held company
Orange Polska S.A.	Specialist for image-related projects				
PGNiG Termika S.A.	Communications Manager	1895 (Jan 2012 – change of ownership and name)	1 069	Heat and electricity generation	Joint stock company/ (72.4% hold by state)

In complementation to case studies, expert group interviews were carried out. Opinion on the SOI development in Poland and in general allows for better reliability of the case-studies.

Three professors from Łódź University were sharing their view on sustainability oriented innovations in Poland and problems inherent to the topic. Two of the three were interviewed together in face-to-face settings and complemented each other's knowledge. The third respondent due to unavailability was contacted by means of telecommunication application software, skype. Second group of experts was based in Lappeenranta University of Technology. Three experts were interview in face-to face meeting organized by the researcher.

The selection of experts was based on their published articles and books and experience in related area. The background of the experts is exhibited in Table 5 below.

TABLE 5. BACKGROUND OF ACADEMIC EXPERTS

University	Title	Expertise	Years of experience in the field
Department of International Economics, Faculty of Economics and Sociology University of Lodz, Poland	Dr.	Ecological economics, Sustainable development, Industrial ecology, Social-ecological systems, Sustainable consumption	13 years
Institute of Economics, Faculty of Economics and Sociology, University of Lodz, Poland	Prof. dr hab.	Institutional economics, Economics of environmental protection, International cooperation in the protection of the natural environment, Sustainable development, Environmental management in enterprises and local government units	17 years
Faculty of Management, University of Lodz, Poland	Dr.	Sustainable development, CSR, Sustainability, Business ethics, Strategic management, Environmental economics, Sustainability research, Sustainability management, Cleaner production, Social economy, Stakeholder management	11 years
Faculty of Industrial Management, Lappeenranta University of Technology, Finland	Doctoral Candidate	Environmentally sustainable industrial networks, Sustainable business models and customer value propositions in industrial markets, Cleaner technology	4 years
Lappeenranta University of Technology, Finland	Doctoral Student	Innovation and technology management, Service innovation, Value creation in networks, Sustainability value and value measurement.	3 years

Lappeenranta University of Technology, Finland	Professor	Strategic Management, Strategic Management Accounting	7 years

4.2. DATA ANALYSIS METHODS

As mentioned already in research and design methodology section, there are two approaches to data collection and analysis: deductive and inductive. Using a deductive approach implies reviewing existing theory to shape the approach that is adopted to the qualitative research process and to aspects of data analysis. However, inductive approach means building drawing theoretical conclusions and framework that is adequately grounded in gathered data. (Saunders et al. 2009)

In this study both approaches are used as the research is based on the profound existing literature on integrating sustainability oriented innovations. On the other side it is not excluded that based on the findings of the SMEs implementation of SOI theoretical implications could be drawn.

Main qualitative analysis process used is categorization of meanings. Categorizing data includes developing categories and subsequently assigning these categories to meaningful chunks of data. Categorization involves the fragmentation of qualitative data to further the process of analysis. Through doing this the relationships will be recognized and the categories developed further. The emergence of an apparent relationship or connection between categories needs to be tested to be able to conclude that there is an actual relationship. (Saunders et al. 2009)

Interviews with companies' representatives as well as group interviews with academic experts were coded applying First Cycle coding and Second Cycle coding or Pattern Codes methods. Codes are labels assigning symbolic meaning to the descriptive or inferential information aggregated during the research. Codes are connected to data chunks of different size. They can be a straightforward, descriptive label or a complex collocation. Code represents and captures a data primary content and essence. First Cycle codes are assigned to the data chunks to find repeating patterns. From those patterns, similar codes are grouped together in

order to create smaller amount of categories, in other words Pattern codes. The interrelations of the categories with one another are built to develop conceptual level analytic meaning for hypothesis or even theory development. In vivo approach was mostly used for First Cycle coding. That is the usage of phrases and words from the participant's speech as a code. In addition descriptive approach was applied, meaning labels or topics were assigned to a passage of data. While first level coding initially summarizes segments of data, second level of coding or pattern coding groups the summaries into a smaller amount of constructs, themes, or categories. Pattern codes are explanatory and inferential. They identify an emergent configuration, theme or explanation. Based on the material from First Cycle coding they pull together information into more meaningful and parsimonious blocks of analysis. One of the most important function of Pattern coding is that for multicase studies, it prepares the groundwork for cross-case analysis. The codified evidence is displayed in form of Tables that makes easy to compare the constructs and patterns in a cross-case analysis. (Miles et al. 2014) The codes were derived from the raw data. Codes were emerging progressively during data collection. Thus the coding is characterized as emergent or inductive.

4.3. RELIABILITY AND VALIDITY

This section pays attention to reducing the possibility of getting the answer wrong.(Saunders et al. 2009) The problems of validity in qualitative studies are related to the fact that most qualitative researchers work alone in the field. They focus on the findings rather than describing how the results were reached (Meyer, 2001). Case studies must meet construct validity, internal validity, external validity, and reliability checks in order to be useful designs. (Yin, 2009)

Case study research in general is perceived to be more subjective than other qualitative research methods. Researches usually have close and direct personal contact with organizations and people interviewed. Hence, researches need to make efforts to hold back from subjective judgments during research design and data collection periods to enhance construct validity. Internal validity in case study research lies in establishing phenomena in a credible way. The researcher tries to identify what elements are significant for examined patterns of similarities and differences between participants'

experiences and beliefs. Also what mechanisms produced those patterns should be determined.

Reliability refers to the replication of the operations and procedures of the research inquiry by other researches which can get similar results. In case study research this can cause issues because people and circumstances are dynamic and changing with a time.(Riege, 2003) In order to avoid reliability problem with qualitative non-standardized interviews, all answers were audio-recorded and transcribed word in word so that other researches may refer to them.

External validity refers to the degree to which the inquiry's findings can be generalized. (Yin, 2014) Explorative, case-based approach limits the generalizability of the empirical findings. Using of small number of case studies will not allow for generalization to a population. Furthermore, the fact that the study is carried out only in Poland restrains the application of the results to other business environments.

5. CONTEXT OF THE CASE COMPANIES: POLISH ECONOMY AND SOCIETY

Poland is a rapidly developing Central Eastern European country. Since its entry to the European Union in 2004 and the beginning of transition in 1990 from a centrally planned to a market oriented economy, Poland has outstanding performance if GDP growth is taken into account as main measure. (Lehmann, 2012) Together with this transition came different approach to innovations as a driver of progress. Innovation represents both a challenge and an opportunity for the country as it looks towards future.

5.1.1. INNOVATION DEVELOPMENT

To endorse innovation in the country, Poland is deploying various financial instruments, upgrading its research infrastructure, and building international strategic partnerships.(The world bank, 2013) The high business potential and strong economic growth factors, such as the receptive internal market, macroeconomic stability, high competitiveness, have been appreciated by the foreign investors. They locate their production facilities, research and development centers or shared service centers in Poland. (PIFIA, 2012) According to the report Modern Business Services Sector in Poland, 2014, out of 470 service centers with

foreign capital in Poland, 113 are R&D centers. The 113 Research and Development Centers with foreign capital employ 21,600 people (ABSL, 2014).

R&D expenditure in Poland amounted to 0.87% of GDP in 2013 which is lower than in neighboring Czech Republic with 1.9% of GDP spending on R&D (OECD, 2015).Current spending on R&D in Poland is far below the 3% target set forth in the Europe 2020 strategy.

Growth in Poland over the last decade has relied more on technology absorption – the application of existing technologies and processes in a new environment where their market and commercial implications are not fully known – than on R&D and innovation. Now, as the Polish economy begins to slow down while the global financial crisis drags on, policymakers must transition beyond the growth model of the past and begin looking toward new areas that can allow for an competitive past growth.(World Bank, 2013)

Although presence of international companies betters the situation in the country, bringing new jobs and income, small and medium size companies constitute the base. Gunter Verheugen in the introduction to SME user guide (2005) emphasizes that micro, small and medium-sized enterprises (SMEs) are the engine of the European economy. They are a main source of jobs, they create entrepreneurial spirit and innovation in Europe, thus are crucial for encouraging competitiveness and employment. The government must invest and support private sector which represents a big challenge for the country with low saving and investments rates, still unfriendly business environment, inefficient public sector, continuous emigration and low levels of social trust. (Piatkowski, M., 2013)

5.1.2. CSR IN POLAND

Concept of CSR development evaluates in stable market economies and to the post-communist market economies it was transferred with a help of EU institutions and western business community. Social and institutional conditions define CSR development. Polish social and institutional conditions entail barriers to genuine CSR integration. Lack of the trust of the society towards business and public institutions contradicts CSR. Underdevelopment of civil society including weak positions of NGOs as social partner or opponent and low levels of consumers' consciousness together with ambiguity of legal framework and ineffectiveness of enforcement institutions does not provide any incentives for business to change their behaviours. Moreover, difficult job market situation and high unemployment rate (11.7% in

March 2015 (Bloomberg, 2015)) expose employees under the risk of being abused thereby breaching labour laws. (Struminska, 2007)

Significant aspects of CSR practice in Poland include crucial role of foreign capital. CSR is promoted in Poland mainly by foreign companies with branches in the host country. They organise informational and educational actions, and more importantly are able to show how to involve business in actions for society and natural environment through many programmes realised in Polish difficult reality. (Lewicka-Stralecka, 2006) Perception of social and environmental issues as marginal and irrelevant to core business activities and strategies and selectiveness of CSR implementation practices.(Struminska, 2007)

Kronenberg and Bergier (2012) summed up drivers and barriers to sustainability in Poland identified in the literature. It is presented in the form of the Table 6 below.

TABLE 6. DRIVERS AND BARRIERS TO SUSTAINABILITY DEVELOPMENT IN POLAND

Drivers	**Barriers**
Structural change Restructuring of companies Competition New institutions in environmental policy, including new economic instruments EU institutional pressure External funding Foreign direct investment External technical support (including sharing of good practice) Imitating good practice from abroad Activity of NGOs Development of mechanisms and institutions during the communist era and the transition period that might support sustainable development	Poor institutions Low environmental and social awareness of citizens and decision makers (‘environment or development’ dilemma) Entrusting PR departments with sustainability/CSR Few genuine good practices available among Polish companies Low levels of social capital and trust New problems related to consumption (e.g. waste, traffic)

Ministry of Economy recognizes that the dynamically developing CSR in Poland realted with the arrival of the 21st century is closely associated with the inflow of a large number of foreign investors. Under the framework of new economic strategy named Europa 2020 – a strategy for smart, sustainable and inclusive growth for EU member states, Poland has commenced National Programme of Reforms. Responsible production, responsible

consumption, change in social awareness, reporting and disclosure, development of respect index and propaganda ion of CSR in the Polish education system and finally sustainable procurement are the main topics tackled within the Programme. (Ministry of Economy, 2010)

6. CASES ANALYSIS

This section contains firstly description of each case study and then comparative cross-case analysis. The case analysis study is based on the field-work research including interviews and secondary data. Each case study includes the description of the company profile, the perception of sustainability and innovation, the ways of implementing sustainability-oriented innovations and dynamic capabilities facilitating the implementation. The four cases in the research have the original name of the organization participated.

The companies selected for analysis are innovative and strive towards aligning sustainability into business strategy and organizational culture. The companies represent various industries such as IT sector, Telecommunications, Consulting and E-commerce, and Energy production sector. The enterprises differ as well in matter of the size. There are two large companies, one small and microenterprise. Various legal forms of business organization of case studies is another distinguishing point. Multinational publicly held company, state – controlled company, registered partnership and private limited company will be presented to compare. (Biel, 2007) Therefore, the cases described are cross-industrial, however situated in one country, Poland.

6.1. LABORATORIUM EE

Laboratorium EE is an IT SME employing 34 workers. The company was established in 2011 by two co-founders. One of the interviewed founders is a sociologist as for educational background. Prior to the establishing firm he worked at University of Warsaw, Laboratory of Social Innovation and Research and Copernicus Science Center. Second co-founder has IT and technical background, however after first year of establishment of the firm he ceased participation in management and decisions-making activities.

The main activities of the company involve research and development projects to create new technological solution, consulting, conducting trainings and workshops, planning project development together with a customer, selling ready-made products, and project implementation in co-operation with a client. The main market consists out of nongovernmental organizations, public agencies and institutions. Thus, the company is involved mostly in social and public projects focused on education and culture. During the last three years company has completed around 250 projects. The firm has three main departments:

- Digital service design department for building the feeling and user experience in internet with focus on social projects,
- Research and development department for improving the knowledge in high technology,
- Products development department.

The company is society-oriented “which tries to change the world with new technologies”. IT is considered as a tool to change education and improve cultural sector in Poland.Their credo is “think by code and build by heart”.

6.1.1. THE ROLE OF THE INNOVATION AND SUSTAINABILITY IN LABORATORIUM EE.

The company is oriented towards sustainable innovation since it was launched. This is a main dimension on their vision and strategy. The direction of the company sees SOI as a core business dimensions and their backbone.

The role of innovation and sustainability in this case is vital because it is the core business of the enterprise and their “backbone”. The company addresses innovation from numerous perspectives. First of all, clear distinction is made between invention and innovation. Second point is that innovation is rather seen as collective work than idea from a single scientist.. For the company innovation has rather incremental character, using existing features and implementing them in a different way or find different market. As the company operates in IT industry, main innovation tool is making change by technology. Also innovation for them is another way of thinking and having no limits in developing ideas. The owner highlights the importance of experimenting and failing and treats it as an essential and necessary part of the innovation process.

"*We define innovation in few ways. First, innovation is creativity plus discipline. Good indicator of innovation is making idea happen not only inventing the idea. Second, innovation is a solution from a group of people who are open-minded, talented, have time for brainstorming and making mistakes, and take new knowledge and experience from it. Third layer of innovation is recycling existing ideas and ready things. Forth way, technology is a mean of innovation because it changes the way people feel the internet. Fifth, innovation means to think different and make impossible things happen.*" (interview with CEO)

The company has adopted an open-minded approach to SOI. In the model of innovation they distinguish between soft features such as being open-minded, having good team, time to make mistakes and time for brainstorming and hard features such as technology and programming. Trial and error approach is considered as one of the driving capability of the company. In short the model of innovation in the company is "make it no complex, work with the best from the industry and improve existing solution of best enterprises"

The model of innovation is supported by matrix structure of the company meaning one person has multiple roles and multiple tasks at the same time. The company uses agile methods, more precisely scrum methodology and lean management which are very common in IT sector.

As for sustainability, Laboratorium EE takes into consideration two aspects of sustainability, that is economic and social. Firstly, optimizing the spending of public funds on IT projects which is related to sustainability in terms of economic efficiency. Moreover, transparency in work process, "showing the kitchen", allows to make social impact and social change. Secondly, as the company works with NGOs and public sector institutions which have society oriented agendas, its projects mostly are aiming to solve social issues. This is rooted in the culture of the company and personal values of employees and the owner himself.

The main motive of SOI lies in desire to solve social, cultural and educational issues together with the development of a new technology or solution to which new market must be found.

6.1.2. IMPLEMENTATION OF SOI

Sustainability oriented innovation or rather social innovation is in the core of the business activities. The purpose of the entire organization is to make social impact by coding. Therefore, almost all the projects of the company are related to the social improvement.

The business model of the company is socially oriented. Laboratorium EE in case of developing new product or service does not sell copyrights. The company is the co-owner of the product or service. Clients are treated as copartners or associates. The company together with its so called business partners co-builds the products and shares profits or losses with them. Such business model is the outcome of the specificity of the main customers which are mainly NGOs or public institutions which are funded from government budget and usually do not have enough financial means to pay for a good IT product. That is why Laboratorium EE accepts lower prices and in exchange co-owns the co-designed product.

Ability to change the market needs and make their own market is inherent for the firm.

Laboratorium EE strategy relies on long-term partnerships with big organizations. The companies is involved in heavy, technologically-challenging, long-term projects. Instead of doing one hundred random websites they give preference for slow and long projects that bring real social impact at the end.

Obviously, the company came to the current state after some modifications in structure, strategy, goals. At the first stage, the firm focused on providing services and gaining experience and learning from the each project. Harvesting from previous years led to developing own products together with business partners and showing products and ideas on GITHUB - crowdsourcing platform. Business model is the consequence of the all prior steps. In order to spread their impact and scale up, the company is planning to expand to other regions and explore new markets.

The incorporation of sustainability criteria in innovation is reflected in developing new products and services. Together with one of their main partner – NGOs HUB – Laboratorium EE have built a product which is a novel worldwide. The company is also continuously improving own existing products and the products of the best in the industry.

In terms of performance measurements, the company uses time efficiency schemes. Key Performance Indicator is used to assess estimated and real time spent on each task within a project. Apart from that Laboratorium EE uses subjective measure of quality of the job done.

"*Our KPI is in quality of code. Our KPI is focused on quality.*" (interview with CEO)

Implementation of SOI in the company depends on chosen methodologies. Common in information technology and software industry is service design, design thinking, user

experience design, and inclusive technology. Design thinking is a human-centered approach to innovation which integrates the people's needs, technology, and the requirements for business success.(IDEO, 2015) User experience design is concentrated on satisfaction of end user to make the interaction between user and product or service best feeling.

"*Already from the beginning we think about experience the end user will have or clients will have working with us. It is a mindset and we try to embed it in our organizational culture.*" (interview with CEO)

Agile methodology including scrum methodology and lean management all together is the hard kitchen of the innovation in the case-company. In addition brainstorming and internal knowledge base system as internal so external represent the elements of knowledge management in the company. Knowledge is openly shared.

Summary of activities the case-company is engaged in are presented below in Table 7.

TABLE 7. SOI ACTIVITIES IN LABORATORIUM EE

Economic	**Environmental**	**Social**
- optimization of the spending of public funds on IT projects - transparency of the work process/ "showing the kitchen" - customer co-creation - subsidizing projects by co-ownership -long-term partnerships	- office space related	- NGOs and public sector institutions are main clients - most of the projects aim at solving social issues - employing regardless Degree obtained, focus on skills and talents - employees' development
Agile management: scrum methodology, lean management		Design thinking, user experience design, inclusive technology

6.1.3. ORGANIZATIONAL CAPABILITIES

Corporate culture is one of the strongest drivers of the SOI integration into business strategy. People's motivation to work and their relations between each other as well as freedom thinking and independence in decision making contributes to the successful incorporation of

sustainability into the entire organization. Honest communication, passion to the work, trust are the constituents of the company culture.

Flexible, matrix organizational structure is second ingredient that enhances communication and better workflow. Presence of R&D department helps to sell analyzed know-how and to find best way to solve the problem in IT.

Another very crucial element is CEO attitude, his fanatic convictions and enthusiasm about social impact. Personal values of the management enhance significantly the implementation of SOI into the business practices.

"*Attitude of the owner is very important: that he likes to take a risk and allows employees to experiment, that he does not want to follow standard solutions, and that he is society oriented. All these drive the values of the company and corporate culture.*" (interview with Strategic Planner)

Skilled and talented team is a base for any enterprise, especially in IT. For example, the firm employs one of the person from G-Query team which provides solutions for internet. Professional designers, engineers, programmers constitute the success of the company.

"*Engineers are bread and butter of the company.*" (interview with CEO)

In terms of relationship with stakeholders, the firm has rather special relations with its clients. They treat their clients as partners and associates. Much attention is given to educate customer, to be transparent in their operations and to involve clients actively into the creation of the product or service.

"*We educate our customers, clients in order they understand what is IT stuff…we show tools and give lectures about what is behind coding.*" (interview with CEO)

Relationship with clients is based on trust and responsibility which allows to make social impact and social change. They establish long-term cooperation with clients and co-design, build product together with clients, therefore making them co-owners of the product or service. It is their "trend to have partnerships". The main stakeholders include Universities, National Library, NGOs, associations, competitors. Laboratorium EE is engaged in clusters and business symbiosis. Their office hosts five other independent companies with whom they occasionally collaborate. Synergy concept is integral part of most of business activities.

"*To be as important as Google or Facebook we need to be together. Symbiosis is the only way to make big entrepreneurial country*. *Our idea is to create Polish Silicon Valley here.*" (interview with CEO)

Location factor play important role. Office space was chosen on purpose in order to host other companies and clients for better cooperation and communication which results in knowledge spillover and synergy.

Employees are the most crucial resource of the company. 80% of the company's costs are people's costs. The relations with employees are built on trust, freedom, independency, deep understanding of the task rather than being a soldier of the company.

"*Our goal is – hardworking people who are relaxed.*" (interview with CEO)

It is emphasized that human resources are the one of the successful factors of innovation in Laboratorium EE. To sum up the company is run based on cooperation, collaboration and parthership with its main stakeholders.

"*SOI is based on partnership, without partnerships with the customers Laboratorium EE would be one of those many companies which make IT in fair trade model, but it is too little*." (interview with CEO)

Moreover, the company acts as an incubator for start-ups. The company supports their employees to start own economic activity by providing office and knowledge on entrepreneurship.

TABLE 8. CAPABILITIES - LABORATORIUM EE

Internal capabilities	**External capabilities**
Matrix flexible organization structure	Cluster, called internal "hub"
Research and development team	Location – close proximity to customers
Team of skilled, motivated, open-minded workers	Co-operation with companies from different industries
Enthusiastic owner/ CEO	
Trial and error approach	
Organizational culture	

There are two sides of operating in sustainable matters. The negative side is financial. It does not pay off because as it has been already mentioned main customers are NGOs and public institutions which are subsidized, therefore the case-company is forced to make concessions and subsidize themselves. Being innovative also costs a lot. Giving freedom to employees to experiment and make mistakes requires huge investments. On the other side, the positive effect lies in the fact that by differentiating approach the company attracts more customers.

"*One of the reasons why they choose us is the transparency and being honest about what we do…in Poland we have trust crisis, relationship crisis and team working crisis. And they need company which is social so that they feel good with us. They prefer to spend money in Laboratorium EE.*"(interview with CEO)

6.2. THE SUSTAINERS SP. Z O.O.

The Sustainers sp. z o.o. is a start-up launched in 2013 by two entrepreneurs from different backgrounds however both dealing with sustainability issues. The enterprise is still leaded by both entrepreneurs. The work is organized on a project-based approach, thus in case of a new project development third expert is being contracted to run the campaign. The company offers sustainability-oriented advisory services to companies and helps to implement sustainability strategies into their business operations. Apart from this, they have developed their main tool: a platform which has three components – crowdsourcing, crowd funding and selling ecological and social products and services. The on-line platform links selling together with development of ecological and social products and services through tools enabling to obtain financial funds and knowledge from the users. The basic idea of the platform was *"to create a space in the internet which could serve as a mix of matchmaker and an incubator*". (interview with co-founder) This initiative integrates the market of ecological goods and services, promotes ethical consumption, healthy lifestyle and responsible business.

The Sustainers sp. z o.o. – is a micro company established by the commitment to build a sustainable world combining passion for sustainability, innovative and systemic approach to solve social and environmental problems.

6.2.1. THE ROLE OF INNOVATION AND SUSTAINABILITY IN THE SUSTAINERS SP. Z O.O.

Since the company is still in a start-up phase setting up on the market, there is no formal definition of innovation and sustainability neither clear strategy nor processes of innovation. However sustainability is fully integrated in the core business of the company which is reflected in their mission and vision which is stated as:

"Mainstreaming sustainability is our mission. In Poland it is still niche thinking." (interview with the co-founder)

As mention already, sustainability is the foundation of company's activities. It is rooted in personal values and beliefs of owners. Even though sustainable entrepreneurship is very challenging field in Poland, they are determined to stick to their passion.

Beyond that, innovation in the enterprise is defined as constant adaptation to changing external conditions. They perceive it rather as forced innovation which comes from the need pull.

"*We are not yet so advanced in developing specific products or services to be able to have structured process of innovation. This is rather spontaneous. Basically we do not have yet any structured process of innovation, it is rather ad hoc reaction to changing reality.*"(interview with the co-founder)

6.2.2. IMPLEMENTATION OF SOI

The origin of innovation developed by the company goes to mostly desire to develop a new products and services to solve social and environmental challenges such as ecological goods and services, promote ethical consumption, healthy lifestyle and responsible business. The company develops and uses a new technology or solution to which they must find a market.

"*We focus on providing tools for sustainability entrepreneurship which is overlooked part of market. There is very little support provided for micro companies.*" (interview with the co-founder)

The success factors of the sustainable innovation in the firm are identified as flexibility, creativity, hard work and ability not to be discouraged. Main barriers to implementation of SOI include poor legal regulations in the field, low consumers' demand on the Polish market for sustainable issues, almost no market pressure to companies to implement SOI into business strategies.

As for the effects of following sustainable values, it reflects in possibility of monetizing know how from the launch of the platform.

Among main methodologies, design thinking and systems thinking were used as means of operationalization of SOI.

TABLE 9. SOI ACTIVITIES IN THE SUSTAINERS

Economic	**Environmental**	**Social**
- advisory services for companies in terms of sustainable development and responsible business - support for microenterprises through on-line crowdsourcing, crowd funding and selling platform (incubator function)	- support in creating concept as well as development of ecological and social products and services - participating in concept development, obtaining financing and implementation phase of socially and environmentally innovative projects. Work at the interface of three sectors: business, NGO, social economy entities and local government administration in social change for sustainable development. - support for sale and distribution of eco and social products and services via on-line platform	
	- "work from home" decreases footprint of travelling and office usage	

6.2.3. ORGANIZATIONAL CAPABILITIES

Since the sustainable e-commerce market in Poland is narrow, coopetition is common and more profitable to do. Combination of skills and resources leads to gaining more clients. In consequence, clients' feedback triggers change and motivates to innovate.

The Sustainers partners with NGOs, public institutions such as Ministry of Economy, Polish Academy of Science. The firm operates cross-sectorally.

On-line platform and main tool of matching and supporting entrepreneurs was creates thanks to funds provided by EU in terms of the Programme for Innovative Economy – National Cohesion Strategy.

TABLE 10. CAPABILITIES -THE SUSTAINERS

Internal capabilities	**External capabilities**
Personal values and background of the owners	Coopetition
Flexibility and fast adaptation to changing environment	Exploit opportunities of EU funding
	Feedback from clients

6.3. PGNIG TERMIKA

PGNiG Termika SA is the largest producer of heat and electricity in combination in Poland. The company is a subsidiary of the PGNiG capital group. Polish Petroleum and Gas Mining is a national state-controlled oil and natural gas company. (PGNiG, 2015). Mainly PGNiG Termika supplies heat and electricity to Warsaw city and its suburbs. Main resource used by the company is coal. In addition, the company elaborates on usage of biomass. In January 2012 the company changed its name from Vattenfall Heat Poland S.A. to PGNiG Termika S.A. due to change in the ownership structure. Previously it belonged to Swedish concern Vattenfall AB, whereas currently it is owned by PGNiG Group.

6.3.1. THE ROLE OF INNOVATION AND SUSTAINABILITY

The company has a strong CSR strategy based on the commitment to maintain high ethical standards in business operations and to the development of CSR idea.

Successfully conducted activities in the field of environmental protection which defines ethical standards of business partners, development of human capital and the range of activities

aimed at employees translates in consequence to high degree of commitment and satisfaction of employees. The company also converses strong and good relationships with local authorities and other external stakeholders. All these confirm in practice the effectiveness of CSR activities carried out by PGNiG Termika.

CSR strategy is based on three main pillars:

- Environmental protection
- Education
- Social engagement

6.3.2. THE IMPLEMENTATION OF SOI

The motivation to develop innovation is rooted in solving issues and exploiting new opportunities which is inherent to the industry the company operates in. Most of the innovations are done in technology and processes and are environmentally oriented.

Ecological aspect is the priority for the company because the company operates in sector with high CO2 emissions, NOx emissions, SO2 emissions and dust. Therefore company invests heavily in technology innovations and installs advanced equipment in order to decrease negative impact on environment. However energy producing field must be regulated and have formalized processes which should be followed at the production site. Thus, for the sake of safety, independence of employees at the site must be limited to routine actions.

One of the CHP plants invests in new technology which eliminates noise through shielding and modernization of high-profile devices. Such programmes are carried out with a though of local communities convenient lives.

Side products of heat and electricity production are utilized in the production of building materials and cement production. Thus, combustion by-products of PGNiG are used as an input in building ring roads in Mazovia region as well as roads inside the Warsaw city. Costs of storage of this waste are reduced.

Installation of wet Flue Gas Desulphurization and selective catalytic reduction of nitrogen oxides are first technologies in Poland adopted in energy sector by PGNiG. Those technologies fulfill the requirements of Best Available Techniques – methodology widely used in energy industry.

In spite of all mentioned above innovative technologies, power plants are coal-fired in 98%. And there are no actions foreseen in the future to a change to renewable energy.

Due to the distribution purposes the location of production sites is very close to the inhabitant areas of Warsaw. The company makes attempts to be a good "neighbor" among local communities.

"*PGNiG Termika wants to be perceived by inhabitants of Warsaw as a responsible citizen.*" (interview with Chief Communications Specialist)

For that reason the company is engaged in range of activities and programmes aimed to educate students in energy field for purpose of further employment of skilled and talented young people. Long-term thinking in matter of education already from technical high schools level ensures the replacement of retired staff, development of skills important from the point of view of future career, building culture of sharing knowledge among future workers and enhances image of the company as an attractive employer.

The company cooperates with local communities, authorities, Warsaw City, schools. PGNiG takes part in projects related to education activities oriented on spreading knowledge about the issue of climate change as well as projects such as revitalization of lake within Warsaw territory and building recreational path along the river for community.

The effects are that the use of high-performance filters as well as advanced technology desulphurization and nitrogen oxide reduction led to significant improvements in air quality. Installation of precipitators and filter bags to decrease carbon dioxide emissions and energy efficient heat accumulator allow to reduce costs considerably as well as give the possibility to trade emissions certificates and get extra income.

TABLE 11. SOI ACTIVITIES IN PGNIG TERMIKA

Economic	**Environmental**	**Social**
- investments in technology innovations and emissions	- usage of side-products as an input material in	- investments in new technologies reducing noise

reduction result in possibility to trade emissions certificates	construction industry - installation of equipment and technologies reducing nitrogen oxide and sulphur dioxide emissions - participation in education activities on spreading knowledge about climate change issues - complementary biomass usage	and thus improving local communities convenience - programmes for students of technical high schools
	Best Available Technique	Stakeholders' engagement

6.3.3. ORGANIZATIONAL CAPABILITIES

Heritage of innovative culture and knowledge from previous owner plays huge role in facilitating development of ideas, projects, and technologies by company. PGNiG Termika tries to maintain the climate and atmosphere inside the company in order to support innovative initiatives that contribute to overall progress of the firm.

Engagement of employees, their active participation is another critical asset of the firm. Dedicated staff and employees' engagement were emphasized as one of the successful factors of sustainable innovation development in the company. There is an internal platform for employees to propose new ideas and projects which are evaluated by appointed team of experts and best selected idea is proposed to management board. Realization of the idea is contingent on available financial funds.

TABLE 12. CAPABILITIES - PGNIG TERMIKA

Internal capabilities	**External capabilities**
Dedicated staff and employees' engagement	Lobbying power as a part of one of the largest energy group in the country
Heritage of innovative culture and knowledge from prior owner	

6.4. ORANGE POLAND S. A.

Orange Polska is leading telecommunication provider in Poland, operating in all sections of the Polish telecoms market. The Group possesses the largest technical infrastructure in Poland with operations in fixed voice, data and mobile networks. Orange Polska is a public company traded on the Warsaw Stock Exchange, with a controlling stake owned by Orange SA, one of Europe's leading telecom operators. (Orange Polska, 2013)

6.4.1. THE ROLE OF INNOVATION AND SUSTAINABILITY IN ORANGE POLSKA

The company is the only one in telecommunications industry in Poland which has its own R&D center. Thus, innovation is crucial for the development of new products, services, and processes in the company. Innovation in R&D center is divided in few areas. First it is a behavior to be innovative, creative and engaged into the work. This relates to particular individuals in the company.

"*It means that everybody should be open-minded and contribute and work with the others.*" (interview with Director of R&D center)

Secondly, innovation means looking for something different. It is rather the capability to combine and merge already existing elements or features in order to build new.

"*In this field the role of R&D centers is important, because our goal is to look for something new: new features, new services and approaches and then try to match them together. This could differentiate our products, differentiate the market or could be new experience for our clients.*" (interview with Director of R&D center)

Third area includes processes and tools supporting two previous ones. The processes imply board acceptance and agreements. Agreements consists of many different behaviors such as acceptance of failures and personal support of the whole process inside the company.

"*In such huge entities as Orange board management support is crucial. The board members have to be convinced personally that innovation is something essential not from the words, but they should be personally and inside committed. …The board members should show personally that they control the entire process and that they are involved in the process from*

inside perspective. This demands real commitment from board members." (interview with Director of R&D center)

Finally, innovation should be embedded in the mission of the company.

"*The organization should be open for failures, let people experiment in order to learn from mistakes. This should be accepted by the corporate government.*" (interview with Director of R&D center)

The model of innovation consists of few separate processes:

- Internal process of working with employees through sharing and gathering ideas.
- External process of working in the whole ecosystem through cooperation with different stakeholders
- Contribution to the research projects on international level as well as EU regional level.

"*Those three legs guarantee that R&D makes sense in such large corporations as Orange. Thus, there is internal process, external process and pure research area. External process is often called open innovation. We try to gather as much as possible from the ecosystem. Open the gate and try to work with people around. Maybe they will support you, give ideas how to solve the problem or deliver ideas for new products.*" (interview with Director of R&D center)

Those processes are facilitated by on-line crowdsourcing platforms. However in opinion of the Director R & D center, tools are not enough. In order to benefit from the people's knowledge and motivate them to create new ideas, trust, will and close collaboration are required.

"*It is not enough just to provide an access to a platform. Employees trust and will, contribution and involvement of everybody to ecosystems is needed. Managers must work very closely in order to benefit from the people with unique knowledge and skills.*" (interview with Director of R&D center)

Although CSR Department and R&D center have a link and cooperate in projects and events, CSR section has slightly different idea about innovation. It perceives innovation as finding new solution or using new tools in order to improve social conditions, thus more society oriented.

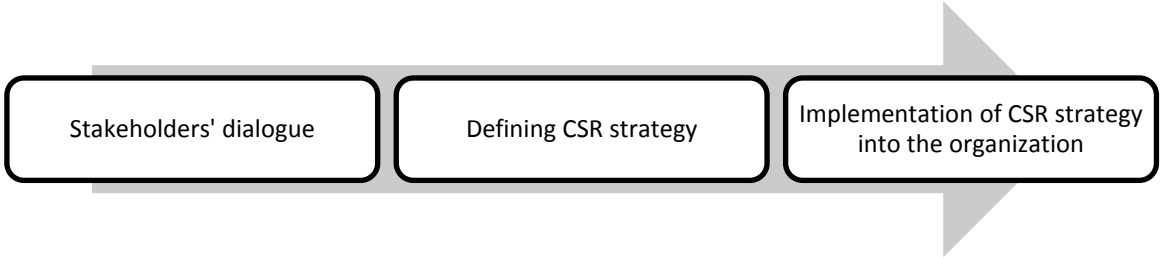
In the case of Orange Polska, the term sustainability equals corporate social responsibility and is used interchangeably. Thus, corporate social responsibility is defined as a corporate culture where the interests of a variety of stakeholders are taken into account in the development and implementation of company's business strategies.

Corporate social responsibility goals are determined by CSR strategy of Orange Polska, which is based on four pillars:

- Digital inclusion
- Safe internet
- Clean environment
- Enquiring team

Even though divided into those four areas, CSR contains as well business ethics, code of conduct, CSR reporting, and supply chain agreements.

Drawing on stakeholder dialogue the company develops CSR strategy and put it into the entire organization. The most important is to incorporate sustainability strategy into corporate culture and business operations. The process can be presented as a picture:



CSR strategy is linked with the core business of the company. The firm aims at including sustainability into the whole organization and more importantly, into the organizational culture.

However sustainability oriented innovation concept is understood wrongly in the company and is considered as ecological innovations only. Also sustainability oriented innovation is perceived as an additional line of work to support core business.

"*It differentiates our current products. It is building the impression that we are innovative.*" (interview with Director of R&D center)

Thus, it can be concluded that sustainability oriented innovations are not embedded into business operations and serves rather as an element of competitive advantage of the company to gain more profits.

6.4.2. THE IMPLEMENTATION OF SOI

In order to integrate sustainable innovations or any innovations into business several necessary requirements need to be fulfilled. One of the necessary conditions is the change an organization culture, change in way of thinking. Excess of rules, regulations and norms in corporations inhibits freedom to decide, creativeness and motivation. It is crucial to change organizational structure and from vertical change to horizontal in order to improve communication channels. Moreover, management must let employees celebrate failures and learn from the mistakes which can be hard in the large business entities.

With an eye to show the importance of CSR and integrate it in the corporate culture, Orange Polska undertakes steps towards education of employees about positive impact of CSR. Wide range of events and activities are organized to increase awareness of employees and other close stakeholders. The most active and engaged into CSR employees are being awarded every year. Using various tools company shows to employees the importance of CSR in daily work.

Cooperation with various stakeholders and coming up with new ideas leads to the development of new product and service. New products or services in consequence are used as a means to solve social problem or decrease negative environmental impact. Extension of functionality for disabled people is an example of improvement of existing products or services which reflects incorporation of sustainability criteria. Regarding supply chain management, the company elaborated process of renewal of telecommunication devices such as mobile phones, routers, modems, so called reverse supply chain. Furthermore, by providing access to Orange's sales network for start-ups to sell their products, the company opens completely new markets managed by small enterprises.

Apart from CSR Department which handles activities on daily basis, CSR Steering Committee is established. Committee consists of managers from various departments and is responsible for implementation of CSR strategy. In addition to managing and coordinating the CSR

strategy, the Committee aligns it with the company's business goals and monitors the implementation of CSR initiatives and projects.

As for methodologies and sustainable criteria taken into account company assesses life cycle of mobile phones, routers and modems, CO2 emissions of telecommunication networks which represents one of their four pillars – clean environment. In the social aspect, inclusive technologies are in use especially for disabled people and elderly people. Moreover, company invests in safe internet applications for children.

Open innovation, design thinking, Green IT, cloud computing, gamification are main tools the company applies in their innovation projects. In terms of environmental management LCA, managing CO2 emissions, eco-efficiency are employed. And stakeholder engagement together with social innovation are included in social tools.

For measuring performance, Key Performance Indicator is the most common index. It is involved in all kind of projects and tasks across the company and can be applied in various fields. Measures are adapted to the projects. Also it is planned to have social impact measured by surveys filled in by employees and partners and by all collected data during previous projects in past. However it is difficult to measure CSR impact because those are long-term processes.

Orange Polska launches various programmes like Green IT with an aim to minimize negative impact on environment. It allows to save energy required to operate servers and other technical devices. The output is calculated number of energy savings and decrease in CO2 emissions every year which is reflected in money savings as well.

TABLE 13. SOI ACTIVITIES IN ORANGE POLSKA

Economic	**Environmental**	**Social**
- giving access to the start-ups to the sales network of Orange - expanding operations to less profitable regions of the country ("white spots")	- IT solutions on telecommunication network saving energy and costs - Office space practices: energy and paper saving - Recycling and refurbishment of old used devices (reverse supply	- stakeholder dialogue - point of sales and website are adjusted to disabled people - development of safe internet applications for children - digital education of senior

	chain) - providing solutions for the city water supply network: savings in water usage	citizens - cooperation with students and further employment of skilled and talented graduates -education of employees and business partners on CSR importance
Key Performance Indicator, employee surveys	Life cycle assessment, management of CO2 emissions, eco-efficiency	Open innovation, design thinking, inclusive technology, gamification

6.4.3. ORGANIZATIONAL CAPABILITIES

As Orange Polska belongs to Orange Group, CEO of the entire group promotes CSR activities in each country where Orange is present. According to the CEO of Orange Group, it is DNA of the company.

Affiliation to Orange network from other countries and cooperation between each other enhances innovation processes and helps in distribution and sharing of innovation ideas and products between countries. Thus scale of business operation of Orange Group is very important driver.

"*The possibility to interact with the global Orange network and learn from partners in Europe, China, Japan, and Africa contributes to the development of sustainability oriented innovations here.*" (interview with Director of R&D center)

PR and image of being innovative company attracts talented and skilled people which in turn are able to develop innovations from which company benefits.

As it has already been mentioned Orange Poland is telecommunication industry is the only company supported by R & D center. In general ICT domain is a "sexy topic", it is very attractive area to work in that brings success. R & D team has certain budget for developing innovations. They cooperate with NGOs, Ministries, cities, students. It forms foundation for development of sustainability oriented innovations.

According to interviewees the entire culture of company as well as active individuals are the essential resources to develop SOI. Moreover, engineers with deep technical knowledge as well as skilled programmers which are open for challenge in other words have zero resistance to change are crucial for company's business.

For Orange, relations with stakeholders are the base. The company cooperates with Universities, students, cities, NGOs, governmental authorities and large corporations from other industries as well as SMEs. Orange Polska organizes numerous programmes for universities, collaborates with students from technical universities which results in further employment of talented graduates. Within digital inclusion and safe internet areas, the firm partners with various Foundations on the subject of diversity, accessibility for disabled people, educating programmes for schools, etc.

Employees as an internal stakeholders are considered to be one of the success factors of innovation development in the company. People's engagement, openness, creativity constitutes to the success of the company growth.

"*Employees are the biggest asset of our company.*" (interview with CSR specialist)

Wide range of contests and on-line platforms are set for internal stakeholders such as employees and partners in order to gather all ideas, select the best, award the winners and commercialize as a last step.

Natural environment is also considered as a stakeholder of the company. Many projects are launched in order to decrease energy consumption and CO2 emissions in office space and IT infrastructure.

Clusters and networks are also inherent to R&D activity of Orange Polska. R&D center is a member of Internet of Things cluster at Warsaw University of Technology, Inotech cluster in Gdansk, ITS cluster.

TABLE 14. CAPABILITIES - ORANGE POLSKA

Internal capabilities	**External capabilities**
Research and Development center	Affiliation to global network of Orange present countries
CEO personal values	ICT and telecommunications domain is "sexy" industry

Board management support	Networking and cooperation with various stakeholders
CSR Steering Committee	Clustering
Image of being innovative company	
Corporate culture	
Employees	
Rewarding systems for active employees	

Following section aggregates and synthesizes description of single cases. Comparison among different business and legal forms of companies will be carried out.

6.5. CROSS-CASE ANALYSIS

Thus, based on previous individual cases analyses a cross-case analysis is carried out in this section. We will frame the main common organizational capabilities and resources together with the differences and similarities found in all the cases. Activities undertaken by case-companies are presented in a Table 15 and described thoroughly.

Social aspect of sustainability is present across all the cases. Identification of activities oriented to social improvement is explicit in the cases where sustainability oriented innovations are perceived as rather additional strategical dimension, in energy generation case company and telecom case company. In power generation company, technology and process innovations prevail aiming at reduction of negative impact both on ecology and local communities. In excuse of having negative influence the company wants to be perceived as a “good neighbor” thus engages in philanthropic initiatives instead of focusing on the implementation of sustainable innovations into the core business and searching for new resources replacing coal.

Provider of telecommunication services adjusted CSR activities of social character to the main operations investing in inclusive technologies for people with disabilities and elderly people and safe internet applications for children. Moreover, to build digital competence in local communities the company embarked on “gamification” technology to engage leaders of Orange studios in small towns and villages to act for the local communities and awarding them for accomplished tasks. Co-financed with EU funds the company is expanding broadband network in “white spots” of the country, regions with poor economic performance

and unprofitable places. Within the company, regular employee surveys are conducted aiming at investigating employees' satisfaction and monitoring changes in opinions. Equal opportunities for all in access to job positions and promotions, diversity management and volunteering initiatives by workers constitute to the social responsibility of the company towards their closets stakeholders – their employees.

On the other side, companies the purpose of which is to make social change and to mainstream sustainability do not make deliberate distinguishment between society oriented practices and their main or essential activities because that is the DNA of the enterprises' strategy. It can be said that those companies are hybrid social and sustainable entrepreneurs. Majority of the projects aim to improve and make changes in cultural and educational sector, for example digitalizing National Library – POLONA, building on-line platform for enrollment of volunteers, system for organizing food collection, thus making positive impact and social change through internet technologies. Collaborating together with NGOs, public institutions and other business Laboratorium EE and The Sustainers find solutions to the determined problems, build new products and provide support for other companies in development and implementation of CSR and sustainable development strategies and projects.

Environmental pillar is presented very clear in two case companies, power generation company and telecommunication provider. Most of the activities of PGNiG Termika are directed at reduction of emissions, thus taking rather a reactive approach. Best Available Technologies are applied in order to decrease sulphur dioxide and nitrogen oxides emissions into the atmosphere, biomass is used as a complementary fuel, selling by-side products of power generation for another utilization and noise reduction technologies in order to make the operations less harmful for local communities. That is main range of activities the company is engaged in. Telecommunication company addresses ecological issues from different perspectives and applies SOI in various fields. Using ICT solutions to reduce negative environmental impact as for example reduce carbon footprint related to business activity, optimizing products and services to minimize environmental impact during life cycle phases, maximizing the recovery, refurbishment and remarketing of used equipment, reducing the number of paper documents and invoices, monitoring the environmental impact of Orange Polska within the EMS system in line with ISO 14001 are main projects and initiatives the company has implemented. Green Box application which automatically turns off unused ports on DSLAMs reducing energy consumption and heat emission. This in turn is reflected in a

reduction of network maintenance costs and GHG emissions. Positive effects of the application attracted other countries of Orange Group to implement the project. Another “Green IT” project commenced by the Orange Polska aims at increasing efficiency of IT function at the same time reducing pollution and consumption of natural resources. It includes an eco-efficient approach to data centers operations, use of cloud technology, development of applications to ensure the maximum efficiency and other techniques to improve infrastructure efficiency. The project tackles infrastructure, server rooms and office space contexts. In addition to technological advancements, the firm sponsors ecological educational programmes for employees. It promotes eco-friendly behavior among the employees through various dedicated campaigns.

Small IT company narrowed down environmental aspect only to office space. That means simplicity in the interior design, reminders of turning off the lights and drinking from a tap. Advisory services microenterprise has ecological sphere embedded in main business activities as company launches ecological and social innovative projects participating in the phase of concept development, obtaining financing and implementation. Distance working also considered as putting less impact on the environment. One must note however that due to small size and limited resources and prioritization of other focuses such firms do not have much affect ecology as large companies thus pay less attention to it.

Companies found it difficult to identify specific acts improving the last field of sustainability – economic efficiency. Three out of four companies act as an “incubator” for SMEs and microenterprises by giving access to the sales network to start-ups, carrying out crowdsourcing and crowd funding campaigns and providing space and creating atmosphere for own economic activity. Noticeably investments in technologies and application to reduce energy consumption and emissions also translate into the costs reductions and financial savings counted in thousands of PLN. Mostly, SOI practices are in line with their main operations, related to their business.

TABLE 15. SOI ACTIVITIES- FOUR CASES

SME - ICT			Micro – Advisory Services		National Group - Energy			MNE - Telecommunications		
Economic	Environ-mental	Social	Economic	Environmental/ Social	Economic	Environmental	Social	Economic	Environmental	Social
Optimization of public funds spent on IT projects	Office space related	Alignment to the society oriented agendas of main customers: NGOs and public institutions	Advisory services for companies in terms of sustainable development and responsible business	Realization of socially and ecologically innovative projects: concept development phase, obtaining finances, implementation	Investments in technology innovations allow to trade emissions certificates	Usage of side-products as an input material in construction industry	Investments in technologies reducing noise	Giving access to the start-ups to the sales network of Orange	IT solutions on telecommunication network saving energy and costs	Stakeholders' engagement
Transparency of work processes		Projects aim to solve issues in cultural and education sector	Support for microenterprises through on-line crowdsourcing, crowd funding and selling platform	Support for sale and distribution of eco and social products and services via on-line platform		Installation of equipment and technologies reducing NOx, SO2, dust emissions	Programmes for students of technical high schools	RESPECT Index - CSR Index in CEE	Office space practices: energy and paper saving	Point of sales and website are adjusted to disabled people
Customer co-creation		Employment regardless obtained Degree – focus on skills and talent		"Work from home"		Participation in education activities on spreading knowledge about climate change issues	Layettes for children of 20 schools in Warsaw		Refurbishment of used devices and equipment with further sales or recycling	Development of safe internet applications for children
Subsidizing projects/products through co-ownership						Complementary biomass usage (1%)	Building playground for children in Warsaw		Smart technological solutions and functionalities for cities	cooperation with students and further employment of skilled and talented

								district			graduates
Long-term partnerships with customers											Education of employees and business partners on CSR importance
Support for employees with own economic activity in terms of knowledge and space											

Internal and external capabilities of each case-company define the scope and scale of sustainability oriented innovations applied to the business operations. First, internal and external capabilities will be compared across all case-studies. Then taking the category of business and legal form as well as size and industry specificity differences and similarities will be presented.

TABLE 16. CAPABILITIES - FOUR CASES

SME - ICT/software		**Microenterprise - Advisory Services**		**National group - Energy**		**MNE - Telecommunications**	
Organizational	External	Organizational	External	Organizational	External	Organizational	External
Matrix flexible organization structure	Cluster, called internal “hub”	Personal values and background of the owners	Coopetition	Dedicated staff and employees’ engagement	Lobbying power	R&D center	Affiliation to global network of Orange present countries
Research and development team	Location – close proximity to customers	Flexibility and fast adaptation to changing environment	Exploit opportunities of EU funding	Heritage of innovative culture and knowledge from prior owner		CEO personal values	ICT and telecommunications domain is “sexy” industry
Team of skilled, motivated, open-minded workers			Feedback from clients			Board management support	Networking and cooperation with various stakeholders
Enthusiastic owner/ CEO						CSR steering Committee	Clustering
Providing time and space for failures and mistakes						Image	
Organizational culture						Corporate culture	
						Employees	

Engagement of employees and dedicated workers internal capability inherent to three out of four cases. In the last case-company team consists out of two persons, the owners themselves and their personal values, skills and motivation could be attributed to the “engagement of employees” ability as well. Personal values and enthusiasm of the owner or CEO of the company is present in three cases apart from power generation case.

Companies from ICT industry emphasized the importance of flexible organization structure, corporate culture, R&D team and acceptance of failures and mistakes in order to develop SOI. Apart from that telecom provider mentioned image if being innovative and PR as addition facilitator that attracts in consequence talented and skilled workforce.

Among external capabilities clustering and networking within and outside the field, cooperation with clients, competitors, suppliers and other stakeholders are viewed all cases.

Telecommunication services provider belongs to the multinational group which is publicly held. Interaction with global network of companies belonging to the group was named as one of the most successful factor of development of SOI. Multinational group has enough of resources to conduct research and development projects which contribute to the growth and development of the entire organization. On the other side public attention is closer to large international companies and maintaining the image of responsible company is more important than for SMEs. ICT and software industry is perceived as very popular and attractive. It is out of zone risk zone to be attacked by media, NGOs and society in comparison to forest or energy industry.

Power generation industry is very sensitive to the ecological issues. It is in highly exposed to the critics of society and NGOs. This forces companies to invest heavily in research and development of new technologies, processes and products. The previous owner of electricity and heat Generation Company put a lot of efforts in building innovative culture that constitutes to current internal capability of the firm. The change in ownership structure to the state control lulls the competitive approach and gives lobbying power.

Privately held microenterprise due to the relatively recent establishment of the company, lack of required resources and unstable and volatile situation on the market set boundaries to the engagement into SOI activities. In the first years start-ups set up on the market, stabilize financial situation, gain customer base and build relationships with close stakeholders.

Personal values and background together with the skills and knowledge of the owners is the main internal capability of the company. Similarly enthusiasm and values of the founder of small registered partnership is the cornerstone of the business.

7. EXPERTS STUDY ANALYSIS

This chapter presents the view of experts from University of Lodz in Poland and Lappeenranta University of Technology in Finland on development of sustainability oriented innovations. The first part is related to Polish market in particular in order to understand the premises, reasons of current state and future directions of sustainability development adoption in the society, business and governmental level.

Experts discussion in second part reflects point of view of advanced in matter of sustainability oriented innovation issues country. Concept of sustainability oriented innovation is viewed in overall terms without references to the country.

7.1. POLISH OVERVIEW

Defining SOI

Sustainability-oriented innovations are viewed by academic expert from Lodz University in Poland as the combination of two elements: “software” and “hardware” of sustainability. Software implies organizational improvement, changing of mentality, modifying strategy, changing of approach. Hardware implies technology improvement and technology changes such as redesign of the production line, change in the design of products and supply chain. Looking at the market, there are companies that are unique and lead the brand. Such leaders in the industrial sector within which they operate are usually multinational corporations which dispose significant resources, network of companies in different countries and lobbying power. Consequently, the rest of the market are followers. They are dependent on technological innovations developed by the sector leaders harvesting investments and buying ready patents. One of the reasons is that other companies are not big enough to have own R&D departments to build new products or technology solution.

The state of SOI or level of understanding the sustainability and its importance to businesses by management or companies is not high. There are different reasons that caused the underdevelopment of sustainability concept in general. First of all, Central and Eastern European countries historically had a break in the development of free market economy. All institutions, systems, regulations typical for capitalistic countries must have been rebuild again.

"*We as a country and individuals have to do some homework in sense of following all things that happen around the world especially in developed countries.*"(group interview with an academic expert A from Lodz University)

Secondly, after the transformation of economy, Polish society experienced problems of human related character. Material aspects which were neglected during communistic period, became of a first importance.

Thirdly, from the United Nations Conference on Environment and Development in Rio de Janeiro in 1992 the term sustainable development was translated wrongly because of lack of appropriate equivalent. Literal translation of the term "sustainable development" to Polish is "balanced development". That caused a lot of misunderstandings of the concept among politicians, media, entrepreneurs, local authorities and ordinary citizens. Thus, for a long period of time sustainability was understood not as sustaining model of development and preserving resources for the future but balancing between natural environment and industrial areas.

Experts from the same University from different field confirm that view and see sustainability oriented innovation rather as an additional aspect of the strategy of the typical Polish companies. Explanation for this statement is that companies do not possess enough knowledge and experience in embedding sustainability in core strategy of the company. Moreover there is no need and no pressure from the customer side. The transformation at the beginning of 90s from communistic to free market economy brought up new opportunities from capitalist market. Even with high social and environmental awareness people focused on material aspects of living and improving material situation. Ecological and social responsibility were put aside.

Neither other stakeholders such as banks, insurance companies, business partners see advantages and benefits of firms to implement sustainability oriented innovations in the

business operations. Firms with sustainability oriented strategies are not distinguished from ordinary companies and are not favored by financial institutions. Thus, currently there are no typical drivers for sustainability oriented innovations to be implemented in Polish companies as such.

Drivers of SOI

Among drivers for sustainability oriented innovations experts identify stakeholders' recognition and awareness of SOI importance, cooperation with companies within the industry and cross-sector collaboration, application of sustainability tools and methodologies such as EMAS, ISO 26000 and GRI. Additional driver for companies to operationalize SOI is the funding from European Union Programmes for innovative firms however it covers only environmental aspect of sustainability.

In opinion of experts economy transition from communistic to market oriented together with joining European Union induced interest for sustainable development among local authorities, companies, consumers. The knowledge and awareness is spreading. In order to solve social or environmental problems local authorities have to cooperate with private sector which in turn stimulates sustainability oriented thinking and implementation of SOI by businesses. This also could be considered as a driver of SOI. For example, one of the case-companies was engaged in the project launched by local government to fix management system of water supply network under the smart city model.

Opening Polish economy caused that main global players entered Polish market and created special climate for doing business. Many divisions of multinational corporations present in Poland are perceived as leaders of change and leaders of sustainability. International companies that operate in Poland have to implement same policies, CSR programmes, code of conduct as in headquarters. Presence of multinational large companies is another important driver of SOI.

The growing role of NGOs on the arena of exaction of sustainability integration into a core of business activities is emphasized as well. Corporate social responsibility creates opportunities for cooperation between NGOs and businesses. Companies to be able to solve social and environmental issues need a social partner by their side. Nowadays CSR became a fashionable trend which results in smaller and bigger partnerships between for-profit and nonprofit organizations. From the point of view of the academic expert such cooperations are

rather in initial stage even though sustainability oriented practices are being promoted and supported by various forums, associations, programmes and projects.

NGOs put pressure on companies to be more sustainable and behave in responsible way. At the same time NGOs educate customers and consumers to become more responsible in their choices and give preference to right companies creating a circular interdependence. Such NGOs bottom up initiatives and movement however are very young and new in Poland and still weak. It is suggested that in future strong coalition of NGOs are going to be an important driver.

There is a lot of collaboration between governmental agencies and business sector on providing support to enterprises in the implementation of competitive and innovative projects. Polish government in turn cooperates with governments from other countries such as Norway, Sweden and Switzerland which results in practical transfer of experiences and practices. Joining EU and EEA gave access to funding and possibility to develop sustainability oriented innovations and pay attention to sustainability issues and ways how to cope with them.

"*EU membership is an important driver of change to sustainability orientation. Putting additional requirements on Polish companies in form of regulations and also providing additional funding for adaptation of firms changes behavior of businesses*."(group interview with an academic expert C from Lodz University)

Barriers

Despite all initiatives, movements, activities, events promoting sustainable development concept experts from Polish side have rather pessimistic view on genuine adoption of SOI in business practices. It is reasoned by several obstacles and issues present in current state. It was repeated few times that knowledge of Polish customers and their awareness of sustainable issues are close to zero. That is one of the reasons of companies being ignorant to the subject.

"*For our society the price of the good or service is the number one criteria. For management of the companies if put competitiveness and sustainability together, competitiveness is on the first place*" (group interview with an academic expert B from Lodz University)

Real benefit and importance of SOI is not recognized by the Polish market, in particular by consumers and business partners. SOI is not translated to the competitive advantage of the companies, but it should be in the future.

The cases of full transition to sustainability orientation that would change the way companies do their business are very rare in Poland. Small CSR activities are undertaken mainly to reduce costs, for example in energy sector, boost PR and marketing and enhance the "responsible" image of the company.

"*The companies do some small activities that are completely irrelevant to the core business, but they say it is a manifestation of CSR*." (group interview with an academic expert C from Lodz University)

Scale of CSR activities is too small in comparison to business operations of the companies. The proportion of CSR initiatives to the core business activities is far too small to say that companies have fully implemented SOI.

SOI is related to individual actions and activities of the company. Those are the tools such as internal audits, cooperation with peers within certain associations to compare CSR trends and practices, learning from each other, benchmarking. For genuine sustainability transition sustainability management systems must be applied. ISO 26000 and GRI have clear guidelines for businesses.

Regarding EU regulations even though they are introduced to national law however the enforcement of the law is very poor. No control over enforcement of EU regulations leads to the formation of "dead laws". One of good examples of the issue is the law on renewable energy which shows how lobbying can make investments in renewable sources unattractive and create barriers for SMEs to enter the market and independent generators to leave the market. (Michal Bacia, 2014). Furthermore, there is evidence of abuse of national law by companies in form of employing people on "junk" contracts, civil or temporary contracts. This is the outcome of poor control over the enforcement of social laws.

Legal situation is not the only to blame. According to experts it has also to do with informal institutions and social capital of Polish culture. Adoption of sustainability is related with people involved in making strategic decisions in the company.

"*Companies are people, not buildings. The people create culture. Culture of companies is linked to beliefs of people. Culture of people is connected with education, experience and quality of social capital. Exactly the quality of social capital is rather low in Poland.*" (group interview with an academic expert B from Lodz University)

Different opinion was expressed that what is really needed is not only regulations, rather creation of climate and environment for discussions, debates and promotional efforts on national level so that society becomes aware and understands better sustainability issues and importance of taking actions in that direction. Golden mean should be found between hard conditions to operate and requirements to follow and awareness building efforts in the society.

7.2. FINNISH OVERVIEW

Defining SOI

Sustainability oriented innovation was defined by experts from Lappeenranta University of Technology as innovation that includes triple bottom line objectives, in other words includes in additional to economical also social and ecological objectives. SOI is often mistaken with clean technology which is wrong because SOI is wider concept covering not only technology. Furthermore, sustainable innovations take many different forms and types of innovations, for example service innovation such as car sharing concept, a new way of operating. Sustainable innovations are rooted in the desire to solve complex worldwide problems, crucial real world challenges. It can be said that sustainability oriented innovations have the purpose to solve important sustainable development issues.

Leaders in sustainability innovation in the industry sector treat sustainability as a key dimension of the business strategy. However for majority of the companies, corporate sustainability is not a key interest.

"*It depends on the company if they want to make it a competitive advantage or not.*"(group interview with an academic expert T from LUT)

SOI in large companies vs. SMEs

Large companies have integrated sustainability issues in their strategies and business operations. The question is how SMEs are dealing with it. Problem is that SMEs are left behind because of shortage of the resources. They have to prioritize what to focus on and choose between development of long-term sustainable innovations and development of projects that bring profits sooner.

The main difference distinguished by the experts between small and medium sized enterprises and large companies is the resources side: financial, human, knowledge, and physical factors. Start-ups however have the capability to adapt quickly and have flexibility and fast reaction which helps to build in sustainability in the core business from the beginning.

Social attention to big companies especially which are inherent to environmental damage such as forest, oil and gas, energy generation forces to conduct reports on sustainability or corporate social responsibility of the company activities. In general, public attention is closer to larger corporations rather than smaller companies. Risk of coming under the public spotlights enhanced by media coverage pushes multinational corporations to invest heavily in sustainability.

Importance of SOI for a company is contingent on the industry specificity and company's size. More companies nowadays understand corporate sustainability more than just license to operate and search for special outcomes and extra benefits from investing in sustainable innovations.

Implementation of SOI is industry specific according to experts from LUT. By nature some types of companies tend to apply SOI more actively than in other sectors. For example software industry with almost no emissions and low environmental impact is less exposed to the critics. Whereas industries consuming large amounts of non-renewable natural resources such as energy and forest industries are sensitive to the sustainability especially environmental aspect of it.

"*Large scale companies have to act in environmentally sustainable way to be able to continue operating further. Such companies just have to find new resources and new ways of doing business otherwise they will be out of the game. Sustainable innovation was a key solution to the challenge.*"(group interview with an academic expert P from LUT)

Apart from environmental side, multinational corporations that have suppliers in developing countries have to consider social side for example, working conditions of employees in outsourced countries. This is sustainable innovation related to supply chain.

Drivers of SOI

As for the key drivers of SOI experts identified among others external drivers such as regulations and laws from governmental side, customer's pressure or social pressure and internal drivers such as minimization of waste, energy efficiency, resource efficiency and costs reduction. Worth to mention that pressure from customers' side is the missing element in Polish society.

Today companies automatically see sustainable innovations as beneficial, win-win situation which is reflected in higher competitiveness. However every silver lining has its cloud. First of all, companies do not have reliable measurement data on real effects of the sustainable innovation value. Benefits from translation sustainability into business activities are often qualitative which are hard to measure. Sustainability innovation also involves value decreasing elements such as uncertainty costs and high risks involved.

In value creation by sustainable innovations customer side is important. Company should clearly communicate values of SOI to clients. Sustainable products or services communicated through ecological and social terms do not sell. Companies should translate it to the customer benefits and possibly then gain "*larger share of the pie for themselves*".

SOI in developed and developing countries

Comparing implementation of SOI between developed and developing countries with transition economy it was agreed that starting point gap is around 10-20 years. Thus developing countries with rapid economic growth have the referencing point. What is needed to foster or forward sustainable innovations implementation is strict rules and regulations which would give incentives to investors to invest in companies that adopted sustainability.

"*Without some push most of the companies will not do anything in direction of corporate sustainability.*" (group interview with an academic expert S from LUT)

This is the first step further. Secondly, societal demand can spur development of solutions to sustainability problems. The good example is recent push to renewable energy in China.

Culture, traditions, history of the nation play an important role in ability to change behavior towards responsibility of actions and decisions.

Barriers

The most critical issues and challenges facing sustainable innovations include uncertainty related to regulation especially for innovations that are dependent on laws, uncertainty about profitability whether customers will pay extra, and uncertainty of invested funds. Working on sustainability involves collaboration of various stakeholders, however many companies narrowed their focus down to company specific issues and have difficulties in opening up their boundaries. Another issue is scalability of the innovations. Many companies developing sustainable innovations operate in niche markets, thus gaining market share, getting customers and expanding abroad constitute challenge for them.

SOI activities

In order to adapt innovation processes towards sustainability companies engage in various type of activities. Environmental measurement activities and examining or measuring the social effects and actual economic effects of the business activities in the future represent one of the examples. Other companies in order to stay competitive on the market start thinking out of the box and undertake transformation of core business activities and go beyond main industry investing as well in cross-sectoral innovations by taking elements from other industries and implementing them to get completely new product, service or process. Furthermore companies cooperate and collaborate across industries searching together for new sources for innovations and solutions for the existing problems. Industrial symbiosis – companies going beyond their normal supply chain boundaries as well as sustainable supply chain management when companies work together inside the supply chains becomes very popular. Numerous methodologies are used such as LCA, ISO standards and even hiring consultant with environmental knowledge to support sustainable innovations realization.

8. DISCUSSION

The main purpose of the inquiry was to investigate implementation of sustainability-oriented innovations in business, how do companies apply sustainability-oriented innovations and capabilities and competencies facilitating it. This concept was studied in the context of four

case companies operating in Poland. Poland is one of the examples of the transition economies growing and developing fast. Moreover, joining European Union spurred investments in innovation and new initiatives in private sector. The theoretical underpinning introduced the concept of sustainability oriented innovation and its implementation in business, facilitated by dynamic capabilities preparing ground for empirical part. The latter considered four cases of implementation of SOI into main operations. The cases vary among legal forms of business organization and size of the companies. The explored issues covered the role of sustainability-oriented innovations for companies, the activities in which companies are involved in relating to environmental and social aspects of sustainability, methodologies used and organizational capabilities and external capacities catalyzing embedding of SOI. Evidence from companies was supported by academic experts view on sustainable innovations development in Poland and overall.

This chapter discusses the findings of the empirical part in the light of the previous theories related to implementation of SOI in business and dynamic capabilities assisting in implementation. Comparison line is drawn between theoretical underpinnings and empirical part. The study comes back to the theory and explores emergent topics from results such as customer co-creation.

One of the most crucial conditions to foster sustainability-oriented innovation integration in business operations is market demand. Wagner and Llerena (2008) consider market demand as a pivot factor that pushes towards leadership for sustainability. Academic panel of experts from Poland and Finland and one of the managers from case-companies emphasize pressure from the market side as being a key driver of SOI. Consumer awareness and knowledge about social and ecological aspects of sustainability is “close to zero” in Poland, thus low market pressure gives no signal or incentives for companies to change.

Regulations is a second enabling factor for operationalization of SOI (Wagner and Llerena, 2008). Membership in European Union implies adoption of EU laws that pushes companies in Poland, especially Polish national companies, to adjust and integrate CSR practices and sustainability-oriented innovation into core business operations. It should be noted that large international companies with headquarters in other countries are mostly subordinate to the laws of country of parent. Thus strict regulations and intensive propaganda from HQ translates onto daughter companies’ strategies and policies. In addition to imposing rules and

norms EU provides funding under development and innovation programmes that triggers movement towards wider SOI adoption.

Main drivers of SOI activities and collaborative capabilities of companies required to adopt sustainability into strategy and integrate into organizational culture are depicted in Figure 22.

FIGURE 22. EXTERNAL CAPABILITIES AND DRIVERS

Management support and commitment is a firm-internal factor that acts as a promoter in acceptance and infusion of sustainability-oriented innovations by entire organization and breaking resistance to changes in organizational culture. (Petrini & Pozzebon, 2010, Wagner & Llerena, 2008, van Kleef & Roome, 2007). In case of large multinational publicly held company board acceptance and management involvement is vital in order to bring sustainability outlook into action. Alternative for SMEs is the enthusiasm and personal values of the owners of the firm. (Klewitz & Hansen, 2014).

Organizational culture when keeps paying high attention to the unexpected situations as well as routine, encourages risk taking and coming up with non-standard solutions promotes sustainable innovation. Independent decision making, brainstorm meetings, relations based on trust and respect, “safe” atmosphere, questioning standard solutions, understanding of the purpose tasks, work with a thought about end user feelings all these define culture in the company. Organizational culture is created and maintained by employees through collective

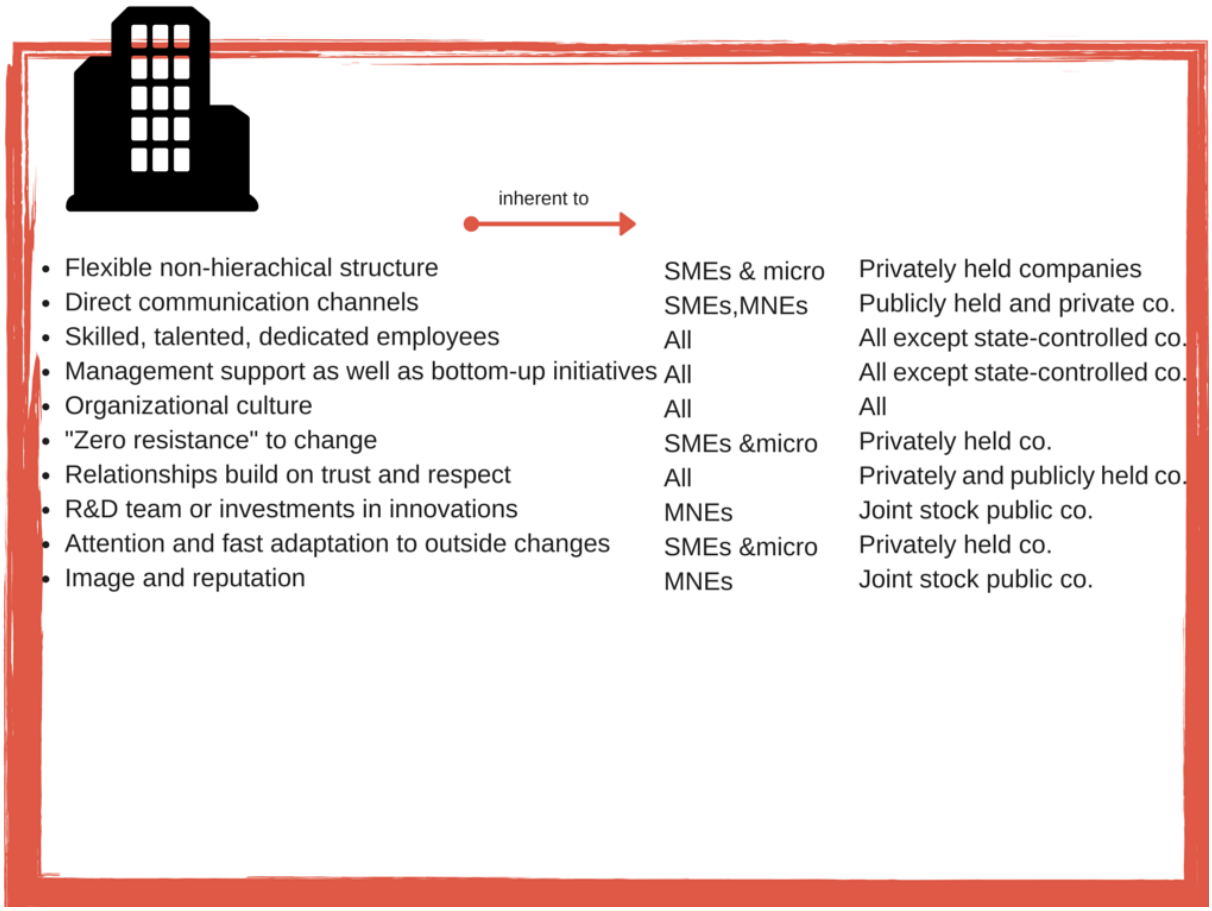
activities such as gathering after work, volunteering together etc. No doubt wiped on by the managers or the owner in case of SMEs accelerates such activities and creates a habits of positive experiences and building trust and mutual respect. In large companies with dozens of various departments and functions people are confined within own departments. Moreover, given that Poland is an individualistic society country, managers must nourish and cultivate strong relationships and strive to change mindsets.

As for start-ups and SMEs so for big companies and even multinationals good team of skilled, talented and passionate people with deep knowledge of a product or service is a critical asset. Human factor plays one of the most important roles in success of the organization in general and a fortiori in development of innovations related to sustainability. People create organizations.

Communication between management and employees and between departments as well as communication between company and clients enhances faster reaction to ever-changing environment and augments competitiveness of the organization. Organizational structure and flat communication channels makes the entire model more effective and allows to read signals from outside faster. SMEs and micro enterprises due to their size and flexibility have the possibility to contact customer or business partner directly and receive feedback from them as well as employees within the organizations have no obstacles in communications paths. Ponderous large companies require to put huge efforts in tuning flat non-hierarchical communication channels. If MNEs succeed in doing so with a support from managers and adoption of similar patterns from HQ country, large national state-controlled companies with stiff hierarchical structure typical for Polish companies fail. According to Hofstede, Polish society accepts and actually needs hierarchy. (Hofstede, 2015)

Firm - internal capabilities identified in all case companies are illustrated in the figure below and are assigned to the type of companies which the most have such features.

FIGURE 23. ORGANIZATIONAL CAPABILITIES



Collaborations in networks and alliances of companies, citizens, government and NGO's – all four sectors (business, government, household and third sector) contribute to the practical realization of sustainability. (van Kleef & Roome, 2007) Networks and collaboration especially for small and medium size enterprises which often lack resources are main mechanisms to support sustainability-oriented innovations (Klewitz & Hansen, 2011) Cooperation with companies within the industry and cross-sector, co-opetition (e.g. Dagnino and Rocco, 2009; Luo, 2005; Bengtsson and Johansson, 2014; Bouncken and Kraus, 2013) and coaction with stakeholders creates synergy and facilitates creation and building of innovative solutions and ideas. Innovating for sustainability is a collective action involving wide range of actors with different backgrounds.

Cooperation with customers, competitors and other stakeholders is vitally important for SMEs and microenterprises to survive and to build innovative products and solutions. MNEs have access to the group network of companies in other countries which gives the possibility to

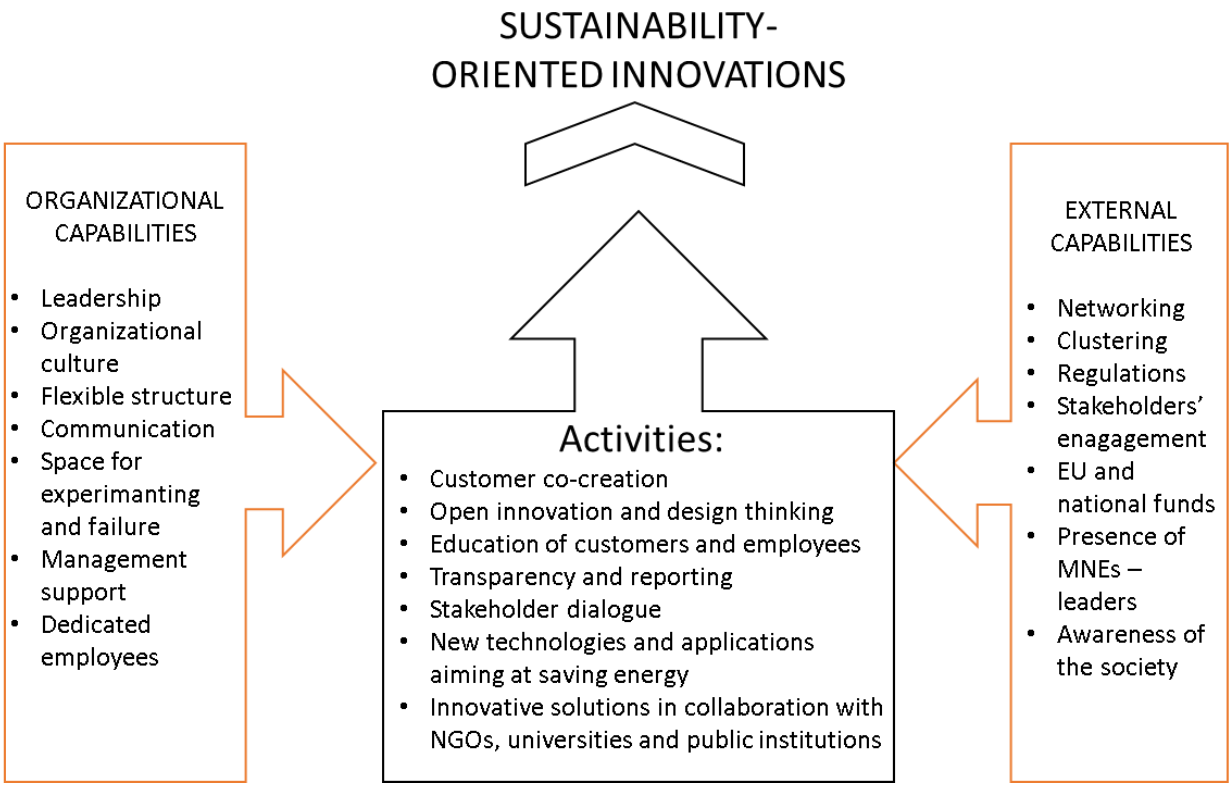
adopt innovations from other daughter companies. Collaboration with third sector and citizens as well as benchmarking activities from other industries opens up boundaries of the company and spurs creation of new products/services or finding a solution to the problem. State-controlled company backed up with the support from government and national budget does not invest much in collaboration activities. Since the major shareholder is state, the cooperations and networking do not influence the competitiveness of the company and satisfaction of the shareholders.

Resting on results of case-studies and experts views on this issue, sustainable innovation activities are industry specific. Industries exhausting large amounts of non-renewable natural resources and producing emissions are sensitive to the ecological issues and are exposed to the critics of public. Polish energy sector is a strategic for national security and is controlled or owned by state. Although having negative environmental impact due to usage of fossil fuels, energy sector has strong lobbying power which is deleterious for the country competitiveness in long run. Corporate lobbying often influences national policies to create advantage for particular industries or companies, to the detriment of the public good. And yet this corporate model in business law and practice have been enshrined and celebrated as a crowning success of our times.(Sukhdev, 2012) Main actions in that market consist out of innovative technologies and processes to decrease negative externalities without investments in research and development to change the way of producing energy.

External innovation process or open innovation means going beyond R&D firm-focused innovations, opening the gate and gathering ideas from outside. Open innovation is one of the elements of the systems thinking and holistic view. Customer co-creation along with open innovation are considered as one of numerous ways of visualizing innovation strategies used by successful companies to create innovative business models, products and services and use them to create competitive advantage.(Bowonder et al. 2010) Customer co-creation spreads the risks and uncertainty partly to the client at the same time giving possibility to influence the final state of product or solution. Followed by co-creation, co-ownership of the final output is one of the options companies adopt. It increases clients involvement into the process, fosters discussions and brings satisfaction to the customer. Latter can may result in establishing long term relationships with customers and treating them as business partners which create sustainable value for both sides. Moreover united efforts create synergy effect.

Transparency of work process and reporting practices allow stakeholders to look inside of the organization and see how company performs in matter not only financial but also social and environmental. It is evident that firms may hide controversial information and prefer to present themselves in a good light. GRI and ISO 14001 EMS are recognized internationally and companies applying it voluntary can claim of being truly engaged in sustainability oriented activities.

FIGURE 24. ACTIVITIES AND CAPABILITIES LEADING TO SOI



Backed with a theoretical review and supported by responses from conducted interviews from companies and academic panel experts the framework presented above in Figure 24 depicts main factors influencing the implementation of SOI and activities in which companies are engaged in. Sustainability is a driving force of innovations. And without innovations sustainability will never be reached. External and internal constituents are identified main facilitators of SOI: leadership, cooperation, dialogue with stakeholders, flexible organizational structure enabling implementation at each level and easing communication, time for

experimenting and transparency of the operations and regulations and market demand as institutional factors.

Companies open up and reveal their information and processes to stakeholders in form of CSR or Sustainability reporting, being included in CSR Indexes and accepting standards. Apart from R&D teams, open innovation, stakeholder dialogue and customer-creation are new trends and methods to assimilate knowledge from the environment and translate it into innovation processes which result in new products/services or solution to the identified issues instead of pushing developed products to the market. Companies start to operate in the ecosystem and think in a holistic way. Power of NGOs and consumer's awareness starts gaining power and strength thus market demand pushes businesses to comply in order to obtain legitimacy to operate and even more see it as an opportunity to grow and sustain competitive advantage over rivals. In turn, companies teach and educate their customers and stakeholders for example in energy sector programmes about climate change and environmental degradation, in telecom sector – about safety on internet and using internet among senior citizens and people with disabilities.

It goes without saying that external stimuli or institutional factors foster SOI implementation. Together with change in mindset of Polish society hard element is required such as enforced regulations hand in hand in hand with external funding. Also emergence of the leaders and pioneers on the market with cutting-edge technologies and solutions with are followed by the rest of the market creates a favorable atmosphere on the market for SOI.

Referring to the Adams et al. (2012) framework of SOI PGNiG is still in the stage of operational optimization taking a reactive position and trying to be less unsustainable by reducing negative impact on society and ecology. Orange Polska is in the organizational transformation phase being a leader in telecommunications industry in terms of SOI. Their SOI activities are integrated into organizational culture and structure, systemic by connecting to the national and worldwide networks and ecosystems and have rather socio-technical character. However it is treated as rather additional dimensions and does not reframe the purpose of the company. Furthermore, Laboratorium EE incorporates some features from organizational transformations and systems builders because they change the rules of the game, reframe the purpose of the business as such, they seek to lead and inspire change in the broader societal, economic, technical and systems. Still environmental aspect is left aside and company is bounded by its size and available resources to be able to change systems.

9. CONCLUSIONS

In the following sections the conclusions of the research are presented; theoretical and managerial implications are pointed, limitations are addressed as well as future research suggestions are presented.

Sustainability-oriented innovation is quite recent topic and the research done in that field is still in its initial stage. Studies on practical implementation of sustainability-oriented innovations can be counted on fingers and mostly investigate the cases of large companies from developed countries.

Thesis examined cases from companies of different size from MNE to microenterprise and of different form of business and legal organization in transition economy country - Poland. Thus distinction was made between state-controlled, publicly held, privately held and general partnership form of companies. Business and legal form of the organization impacts integration of SOI into core business operation and strategy. Supported by state the company takes rather reactive approach and focuses mainly on technologies decreasing negative impact on the environment and society in combination with philanthropic activities. The lack of competition lulls the awareness and attention to changes which inhibits progress and reduces competitiveness of the nation. Privately held microenterprise is struggling in order to set up on the market and lacking resources to fully develop SOI strategy. Joint stock company publicly traded on stock exchange possesses necessary physical, financial, human and intellectual resources by belonging to the international network of group companies and sharing solutions within and is able to invest and achieve SOI goals. However high expectations of shareholders and responsibility to meet the needs of the owners drive managerial decision making process in order to increase profits and perceive SOI rather as additional line to the main business which brings competitive advantage, improves reputation and reduces costs occasionally. General partnership by involving customers into co-creation and treating them as their business clients has critical capabilities for implementation of SOI into business operations and brings useful solutions for society, however working together is an effort-taking long-term process which pays off on a slower rate than pure commercial projects. Thus ownership structure, form of business organization, size, type of industry play an important role in what type of SOI activities firm adopts and capabilities develop.

Joining European Union gave a push to the economic development of the country. Various programmes launched in order to spread the knowledge about sustainability issues, educate consumers about responsible decisions and provision of funds for entrepreneurs shift step by step the orientation towards sustainable development. Start-ups and SMEs driven on personal values and beliefs of the owners have SOI as a core strategy of the business. Thus, activities are difficult to identify since the line is blurred and SOI became a DNA of the company. MNEs are considered as one of drivers of SOI due to their global reach, leadership positions in innovations, resources and networks. Such companies have clear defined CSR strategy, established CSR department and R&D team, publish CSR/Sustainability reports and heavily invest and educate into the mindset and cultural change towards sustainable strategy.

Factors facilitating translation of sustainable innovations into companies' operations are divided into internal capabilities - organizational competences and external capabilities – institutional factors. Management support and commitment, conviction and beliefs of CEO/owner, leadership and initiative coming from employees, non-hierarchical communication channels, organizational culture and flexible structure of the company, skilled and dedicated employees, and reputation constitute to the firm-internal capabilities enhancing sustainable value creation by company. Evidence from cases supported by panel of academic experts claims that introduction of new regulations and funds from EU as well as share of experience and practices from EEA countries plays a significant role in development of sustainable innovations. Collaboration with cities, third sector and local authorities promotes SOI. Clusters participation becomes popular.

"*Working together is the only way to build big innovative and entrepreneurial country*"(interview with CEO Laboratorium EE)

Poland is an interesting contextual country to conduct a research. Despite of having a break in development, it is one of the best performing countries recently joined EU. There are few other countries in EU which had a transition of economy from communistic to capitalistic and could take an example from Polish growth miracle. The investments-friendly environment attract many international companies to set up as subsidiary which drives innovation and sustainability as such companies are leaders within the industry. Overcoming barriers in forms of regulations unfriendly for entrepreneurs, low social awareness and trust crisis, a lot of young enthusiastic entrepreneurs who care about ecological and social issues, step by step build the layer of society that can become a base for sustainable growth.

Theoretical and practical contributions

The study contributes to the SOI research field which is in its initial stage. SOI exists on the cross-section of other research backgrounds. Innovation management, organizational sciences, clean technology, environmental management cover SOI partly and in turn SOI endows those fields of knowledge. The study attempted to identify the ways in which various firms apply sustainability-oriented innovation into their business on all levels, and what are the key successful factors necessary for full translation SOI into main critical business areas. There is little research on sustainability oriented innovation conducted in Polish context. Thus, this is one of the first attempts to analyse SOI among companies operating in Poland. Moreover, the Thesis contributes to the studies concerning SOI from the point of view of different legal forms of business organizations and assumes it influences how companies perceive and treat SOI. Most of the research conducted in the field elaborates on successful examples of sustainable innovations operalization in large international companies. The inquiry includes both successful and unsuccessful cases of SOI translation (Pfitzer et al. 2013) Mostly, the research endorses previous research on organizational and institutional capacities needed for companies to become more sustainable.

The practical benefits of the study are directed at the companies willing to implement SOI and looking for a benchmark. Moreover found organizational and external capabilities facilitating alignment of sustainable activities to business activities could serve as a necessary competences to develop. Results of the work represent a good example for companies that create social value and environmental value by combining efforts with stakeholders and other industries, solving social issues. Integrating CR into business operations also brings benefits and creates economic value for the firm.

Finally, countries with economies in transition can take best practices and solutions from Poland and learn also from mistakes of the government not to repeat them. And even western European countries may transfer certain activities and capabilities into their practices.

Limitations and future directions

The choice of the research method imposes boundaries on validity of the Thesis. Sample size of the cases limits generalizability of the findings. There is only one case representing each form of business. The choice of the companies was conditioned by positive replies to take part in the study and conduct an interview. Ignorance of the managers to the request may depict negligence of the issue by companies. Research embraced companies operating in Poland and results may have country specific character.

The findings could also be a subject to bias based on relations between interviewee and interviewer. The problem of trust and willingness to provide information can distort the results of the interviews. Moreover, as conversations were held in English some of the participants had difficulties to express and find proper word which also influences outputs.

Questionnaire was provided by the team leading the project. During the interviews with small companies it was noticed that most of the questions are directed to large companies with numerous departments. Due to this fact not all aspects of SOI could be reveled referring to the two small companies.

For future inquires researcher can propose to enlarge the sample size for each of the business and legal forms in order to create a pattern inherent to a particular type of the organization. In addition, studies can be longitudinal seeing how companies evolve and change over the time period in terms of implementation of SOI. It would be also interesting to investigate application of SOI within one industry between various companies. Another assumption could be the research of MNEs activities however in various countries to see differences and similarities and cultural specificities conditioning the results.

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INTERVIEWS:

Interview with CEO Laboratorium EE

Interview with Strategic Planner/ Senior Communication Officer Laboratorium EE

Interview with Director of R&D Center Orange Polska

Interview with CSR Specialist Orange Polska

Interview with co-founder The Sustainers

Interview with Chief Communications Specialist PGNiG Termika

APPENDICES

Interview Guidelines:

SUSTAINABILITY ORIENTED INNOVATION: HOW IS IT IMPLEMENTED BY ORGANIZATIONS RESEARCH PROJECT

DEUSTO BUSINESS SCHOOL

Professor LAURA ALBAREDA

Guidelines for interviews

Interview: Director of innovation or technology, director of strategy, director of marketing and communication and director of sustainability.

If the company is a SME or start-up, the first interview must be the owner/CEO or entrepreneur.

You must record the interview

Questions

1. How do you define innovation in your company?

   a. What is the role of innovation in the company?
   b. What is the model of innovation?
   c. How innovation is organized?

2. How is sustainability defined in your company?

   a. What are your goals?
   b. Why is it important?
   c. What is sustainability important for your company?

3. Would you mind to tell why SOI is important for the company? Is it an strategic goal?

   a. What are the main problems identified on the framework of SOI?
   b. How do you identify the problems? Do you use a methodology?
   c. Do you use life-cycle analysis assessment?
   d. How does the company try to solve these problems? Explain about the problem-solving process
   e. Identify the problems/challenges which interfere into implementation of such innovations

4. What are the pillars on which its sustainability strategy is based? What are the pillars on which their innovation policies are supported?

   a. Organizational Structure
   b. Overall management and / or processes
   c. Cross-functional or in charge of a department
   d. How team SOI managers and projects related to the general direction

5. How do you integrate the sustainability strategy into innovation and core business strategy?

a. Organizational structure
b. Technologies
c. Where do the new ideas or projects come?

6. What are the main differences about integrating sustainability criteria in innovation processes from other companies?

7. What do you think are the success factors of innovation in your organization?

8. What effects (direct and indirect) is the sustainability of innovation on the financial performance of the company?

9. Is your company partnerships with different actors? Traditional R&D patterns? Different stakeholders such as NGOs, communities, citizens…?

10. How does the incorporation of sustainability criteria reflected in innovation in your company?

a. New products or services
b. Improvements to existing products or services c. Business Model
c. Value chain or product lifecycle e. Processes
d. others (name them)

11. Are sustainability oriented innovation projects a core or priority strategic hub for business (core business) or it is just a new line of work that has been tested? Does it has economic impact? How do you measure the performance?

12. What resources and skills are essential for developing innovation in the enterprise?

13. What resources and skills are essential for developing innovation towards sustainability in the company?

14. What are the sustainability criteria that are taken into account?

a. Environmental: product life cycle, CO2 emissions, disposable / biodegradable materials ...
b. Social: fair trade, working conditions, inclusive technologies, end-user participation
c. ...

14. What are the main tools or clean technologies that the company is applying in the sustainability oriented innovation projects?

a. Environmental management: Life cycle analysis, Circular economy, Managing Co2 emissions, Eco-design, Eco-efficiency, Bio mimicry, cradle to cradle, industrial symbiosis
b. Social tools: SRI, stakeholders engagement, social innovation, bottom of the pyramid, systems thinking

c. Innovation tools: reverse innovation, frugal innovation, Jugaad innovation open
d. Innovation, design thinking

15. Where do new ideas for innovation towards sustainability? Could you draw a diagram using the process of generation of new initiatives?

16. Where do new ideas come from? Are guided more by ideas (technology push) and market demand (market pull)?

a. The company, internal innovation teams
b. The company, CSR teams
c. Customers
d. suppliers
e. competitors
f. customers
g. Universities and research centers
h. Trade shows and seminars
i. other collaborators (name them)

17. What percentage of innovations developed by this company has their origin in each of the following?

a. The desire to develop a new product, service or sustainable process. b. The desire to address unresolved issues.
b. The desire to exploit new opportunities.
c. The development of a new technology or solution within the company or with allies, to which they must find a market.

19. What is the role of the stakeholders of the company for the innovation process? Is there a platform for ongoing collaboration or partnership with any of them to collaborate?

20. What is the role of clusters? Are they important? Do you use industrial symbiosis?

21. What methodologies are applied for sustainability oriented innovation?

a. Eco-design
b. Technologies
c. Design thinking
d. others (name them)

22. Do you measure their sustainability oriented innovation by some indicators?