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Title:

ANALYZING THE ROLE OF HUMAN RESOURCES

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ANALYZING THE ROLE OF HUMAN RESOURCES

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ABSTRACT

This thesis examines the role of Human Resources Analytics in strategic decision making . It analyses the current position of Human Resources in companies with open innovation approach, focuses on challenges of open innovation implementation and reviews how Human Resources, and organizational practices, can help to overcome those challenges, as well as it foresees the entire role of Human Resources in open innovation process.

The theoretical part of the research consists of the literature overview devoted to open innovation, Human Resource Management and application of Human Resource Management to open innovation. The qualitative research method has been applied by conducting the in- depth interviews from open innovation practitioners and the inductive data analysis comparing the findings with the theoretical statements.

The results show ambiguous view on the role of Human Resources in open innovation: it finds more support from the theoretical perspective than from the practical implication. Human Resources does not participate in the process of open innovation currently, though, some organizations have already recognized its necessity to join this process. However, the organizations face many challenges to implement open innovation and many of them indicate where Human Resources can be influential and which organizational practices can help to overcome those barriers. Overall, the role of Human Resources in open innovation is an emerging process with a prediction of strong impact in the nearest future. However, in order to be involved in open innovation, Human Resources role has to be reconsidered and become more innovative itself.

AKNOWLEDGMENTS

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Most importantly, I would like to thank my beloved Javier Hernandez for keeping my life in context, helping me to go through any challenges and inspiring me for new ideas.

1. Introduction

1.1. Study Background and research problem

Formulated by Chesbrough in 2003, open innovation (OI) has become very popular concept among the researchers and it is gathering momentum among the industries. The reason for that – is a new way to perceive business relationship and create innovations. As any innovation, it goes through many stages of its diffusion (Rogers, 1983).

The research of open innovation is growing every year exponentially and adding new classification and structure to understand this phenomenon. Despite of struggling with OI understanding, its challenges and criticism, already more than 60% of European companies consider themselves as adopters of OI approach (Podmetina et al., 2016).

Since companies decide to open up their boundaries, possessing technical or scientific knowledge is not enough. According to Bredin and Soderlund (2006); Huston and Sakkab (2006) people should poses specific skills, competences and be properly trained, and here the Human Resource (HR) function comes as an aid.

1.2. Research gap

However, while many research scholars and practitioners speak about the need of OI adoption and refers to different aspects of OI process, only a few authors mention HR to be part of this process. Nevertheless, there is enough literature showing the positive effect of HR practices on organizational performance, including the methods to make company more "open innovative", but there is lack of qualitative research that could reveal whether this process happens on practice and how. This research gap was also noticed and emphasized by Vanhaverbeke, Chesbrough and West (2014) as a call and encouragement for the researches to investigate more about HR and OI implications. This Master's Thesis aims to shed the light on the stage of HR involvement in the process of OI and find the practices to foster it.

1.3. Research questions and objectives

The main goal of this research is to determine the role of HR and the possible organizational 8

practices to foster open innovation in the organizations. The sub-questions and the objectives of the research have been developed accordingly (Table 1).

Table 1. Research questions and objectives

Research question	**Objective**
What is the current place of HR in the process of OI?	To identify the involvement of HR in OI process and areas of this involvement.
What are the barriers of open innovation implementation?	To find the activities that organizations use to implement OI and challenges they struggle during the implementation of OI.
Which HR and organizational practices can help to foster implementation of open innovation in organizations?	To elicit HR and organizational practices that can help to overcome mentioned barriers along the process of OI implementation.

1. 2. The first question aims to identify the current place of HR in the process of OI implementation, whether HR function is involved in this process and how, and what are the reasons if it does not.

The second question is called up to find what actually organizations are doing to implement OI and how they are doing it, and consequently to find the barriers the organizations meet during this process.

The third question is presented to understand which HR and organizational practices can help to overcome mentioned barriers of implementation and as the result to shed the light on the range of possible roles that HR can perform to foster open innovation.

1.4. Organization of the study

This paper consists of six parts including 1). Introduction; 2). Literature review; 3). Methodology; 4). Results and findings; 5). Discussion and

6). Conclusion with the list of references and appendix. The research design is presented on Figure 1.

The Introduction describes the research background, research gap, denotes the research questions and objectives and draws the research structure. The Literature review observes

theoretical aspects of open innovation, Human Resources Function and Organizational Practices and finds the connection between these three notions. open innovation is observed through its understanding, classification, challenges and criticism. HR function is explained from the scholar's view, and organizational practices are differentiated from HR practices. The role of HR in OI has been found from the organizational and individualistic perspectives expressed in organizational capabilities and skills and competences required for OI. The challenges regarding HRM in OI are also have been investigated.

The Methodology was chosen as an exploratory qualitative research, with the primary data collection from semi-structured and in-depth interviews, and inductive method of analysis. The data collection process, the content of the interview guide and the general information about the interviewees are also described there.

The Results and Findings have been grouped according to the primary data in five sub-chapters, presenting the insights about the Concept of open innovation, Managing open innovation, Implementation of open innovation, HRM in OI process and OI as a job role.

The discussion part compares findings with the literature context. Following the logic of the Results and Findings, it reflects the outcomes from the HR point of view, and answers the research questions. As the result, it builds the framework of HR implications in OI process, giving the recommendations to managerial implications.

The Conclusion summarizes the research findings, mentions the limitations and provides the insights for the future research. The list of references and the Interview Guide in Appendix I are finalizing the

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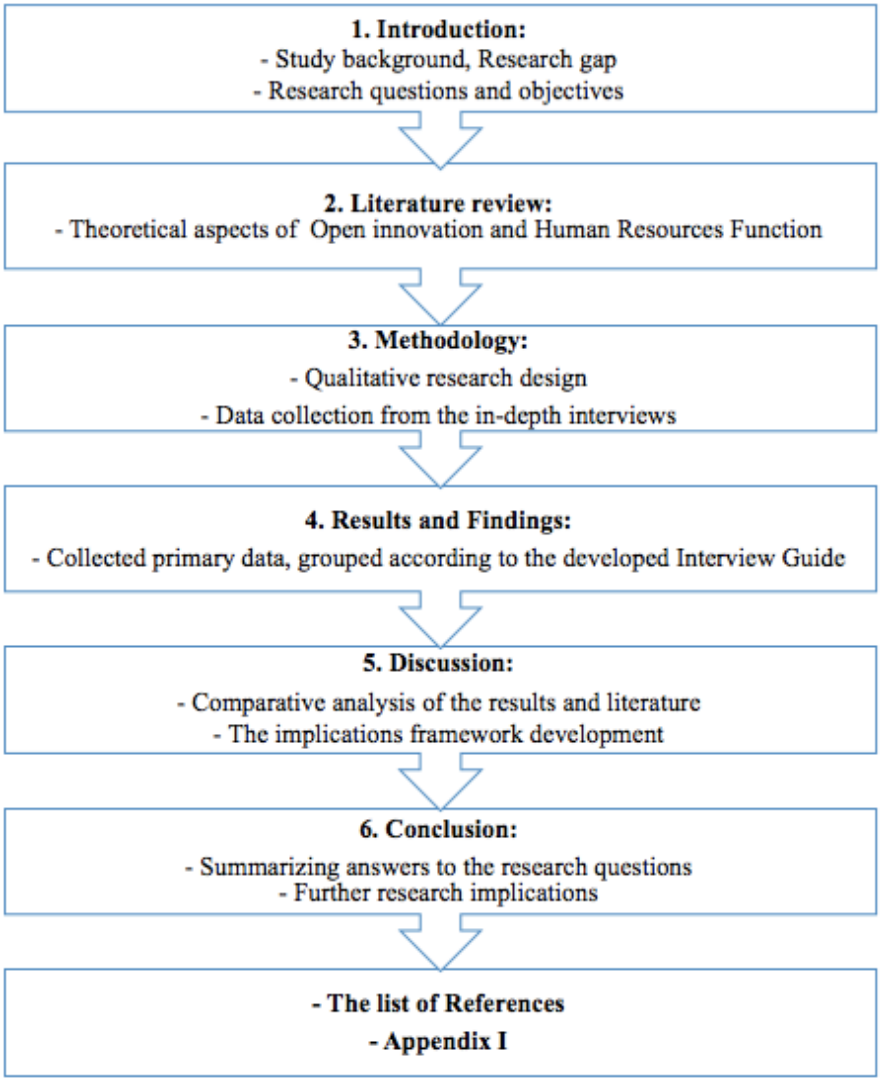


Figure 1. The research design

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2. LITERATURE REVIEW

2. 1. The Concept of Open Innovation

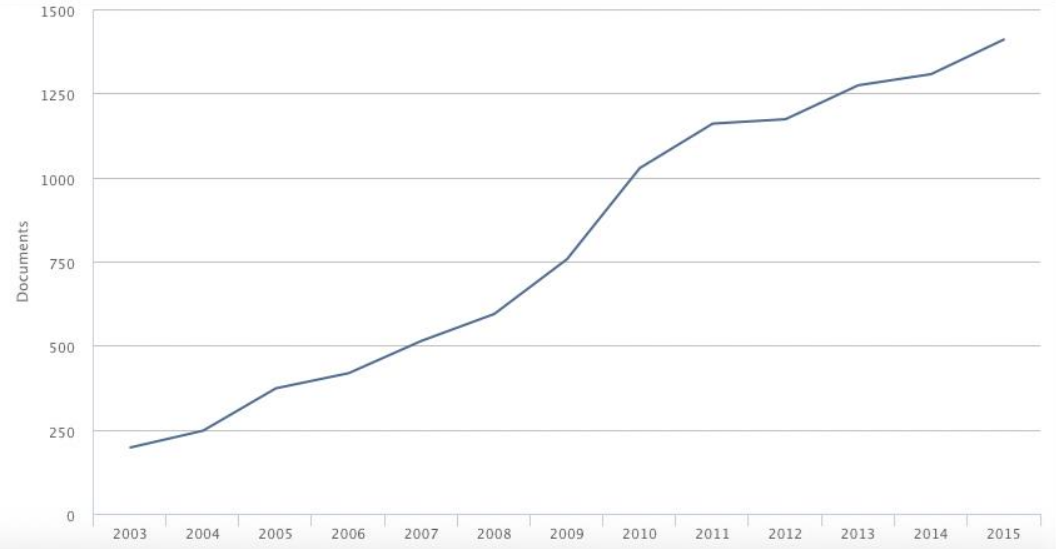
The concept of open innovation, established in 2003 by Chesbrough, has become a popular topic in the last decade mostly because of economical and intellectual property usage (Chesbrough, 2003b) reasons. The first scholars Chesbrough, Vanhaverbeke, and West (2006) started to stimulate the debate among the researchers on investigation of this concept. The Scopus database shows significant growth of articles with "open innovation" in the titles, keywords and abstracts (Figure 2).

Figure 2. Scopus analytics of open innovation by title, abstract and key words (Scopus, 2016)

The book of Vanhaverbeke, Chesbrough, and West (2014) *New Frontiers In Open Innovation* became the fundamental collection of knowledge on open innovation concept so far.

According to the collected data, since 2003 over 18 books with open innovation heading have been published. The sample of open innovation connections among the study fields showed the five most popular fields: Management (603), Business (338), Industrial Engineering (173), Operations Research and Management science (129) Planning and Development (123). The least citied areas were Art (5), Biochemistry and Molecular Biology (5), Engineering and Chemical (5) (Chesbrough and Bogers, 2014).

Several definitions of open innovation have been presented since 2003. The first and classical definition of Chesbrough (2003) was *"Open innovation is a paradigm that assumes that firms can* 12



and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology". Lately, he corrected it for *"The use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively"* (Chesbrough, 2003c). In 2006 West and Galagher (2006) offered their understanding of OI as *"(...) encouraging and exploring a wide range of internal and external sources for innovation opportunities, consciously integrating that exploration with firm capabilities and resources, and broadly exploiting those opportunities through multiple channels"*. Whereas Chesbrough and Bogers (2014) finalized it for *"Distribute innovation process based on purposively managed knowledge flows across organizational boundaries, using pecuniary and non-pecuniary mechanisms in line with the organization's business model",* - which is still valid until now.

Chesbrough (2003) compares the main principles of closed and open innovation models (Figure 3).

Figure 3. The principles of open innovation (Chesbrough, 2003)

Together with definitions' formulation, the structure of OI has been also under investigation. Thus, Gassman and Enkel (2004) identified three

core archetypes of open innovation process: (1) the outside-in process, (2) the inside–out process, (3) the coupled process. Outside-in process is described as cooperation with the partners for the external knowledge integration. Inside-out process is based on externalizing the company's ideas and knowledge by commercializing them and generating the profit. Coupled approach is characterized by combination of outside-in and inside-out processes. In order to achieve the results using these two approaches, the companies

Contrasting Principles of Closed and Open Innovation	
Closed Innovation Principles	**Open Innovation Principles**
The smart people in our field work for us	Not all the smart people work for us. We need to work with smart people inside and outside our company.
To profit from R&D, we must discover it, develop it, and ship it ourselves	External R&D can create significant value; internal R&D is needed to claim some portion of that value
If we discover it ourselves, we will get it to market first	We don't have to originate the research to profit from it.
The company that gets an innovation to market first will win.	Building a better business model is better than getting to market first
If we create the most and the best ideas in the industry, we will win	If we make the best use of internal and external ideas, we will win
We should control our IP, so that our competitors don't profit from our ideas	We should profit from others' use of our IP, and we should buy others' IP whenever it advances our own business model.

gain to cooperation and building strategic networks (Figure 4).

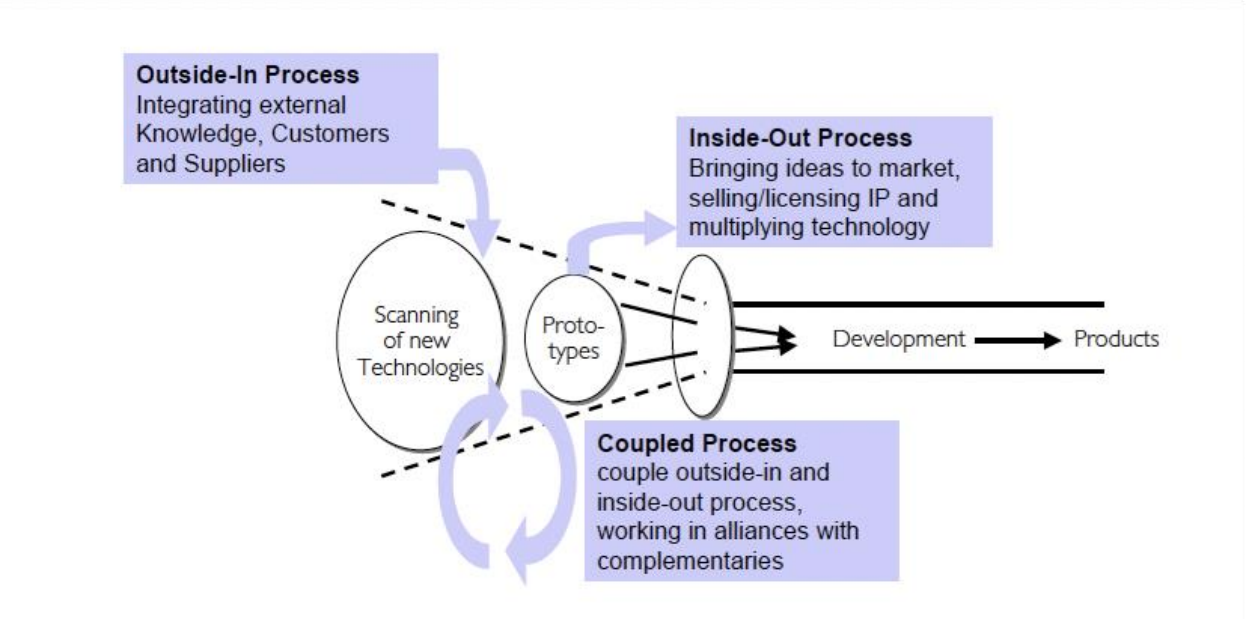


Figure 4. Three core archetypes of open innovation process (Gassman and Enkel, 2004)

Meanwhile Chesbrough et al. (2006) limited the process to Inbound (outside-in) and Outbound (inside-out) flows. Dahlander and Gann (2010) also added pecuniary and non-pecuniary dimensions later.

In 2014 Chesbrough and Brunswicker (2014) used classification on pecuniary and non-pecuniary dimensions and inbound/outside-in and outbound/inside-out terminologies as interconvertible notions. Finally, Chesbrough and Bogers (2014) add the list of OI mechanisms for three dimensions: inbound, outbound and coupled with pecuniary and non-pecuniary flows. These flows are consisted from different OI activities.

The chronological order of OI definitions and structures is presented on Table 2.

Table 2. Chronological order of open innovation definitions and structure

Authors

Gassman and Enkel (2004)

West and Galagher (2006:1)

Definition

OI structure

(1) the outside-in process, (2) the inside– out process, (3) the coupled process (Figure X).

Chesbrough, (2003:24)	"Open innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology"
Chesbrough et al. (2006)	"The use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively".

"(...) encouraging and exploring a wide range of internal and external sources for innovation
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opportunities, consciously integrating that exploration with firm capabilities and resources, and broadly exploiting those opportunities through multiple channels".

Chesbrough et al. Inbound (outside-in) and Outbound (2006) (inside-out) flows.

Chesbrough and Brunswicker (2014)

Chesbrough and Inbound, outbound and coupled flows Bogers (2014) including pecuniary non pecuniary

activities

Open innovation is based on the idea of using internal knowledge of the company as well as finding and using external ideas to advance their technology. Chesbrough (2003a) explains that the best minds are always situated outside the firm and the firm should utilize and use those minds and their ideas.

Nowadays, there is no approved structure of open innovation activities. The researchers still investigate and offer their variations and classifications. Chesbrough and Brunswicker (2013) give the classification based on inbound/outbound flows and pecuniary/non-pecuniary activities (Figure 5).

The Buying and the Selling sides: outside-in and inside-out transactions

Four business models: open business model, partially open business model — the buying side, partially open business model (the selling side), and the closed business model.

Pecuniary and non-pecuniary dimensions, where Pecuniary activities are presented by Inbound activities — acquiring and sourcing; and Outbound activities — selling and revealing. Pecuniary and non-pecuniary dimensions and inbound/outside-in and outbound/inside-out terminologies as interconvertible notions.

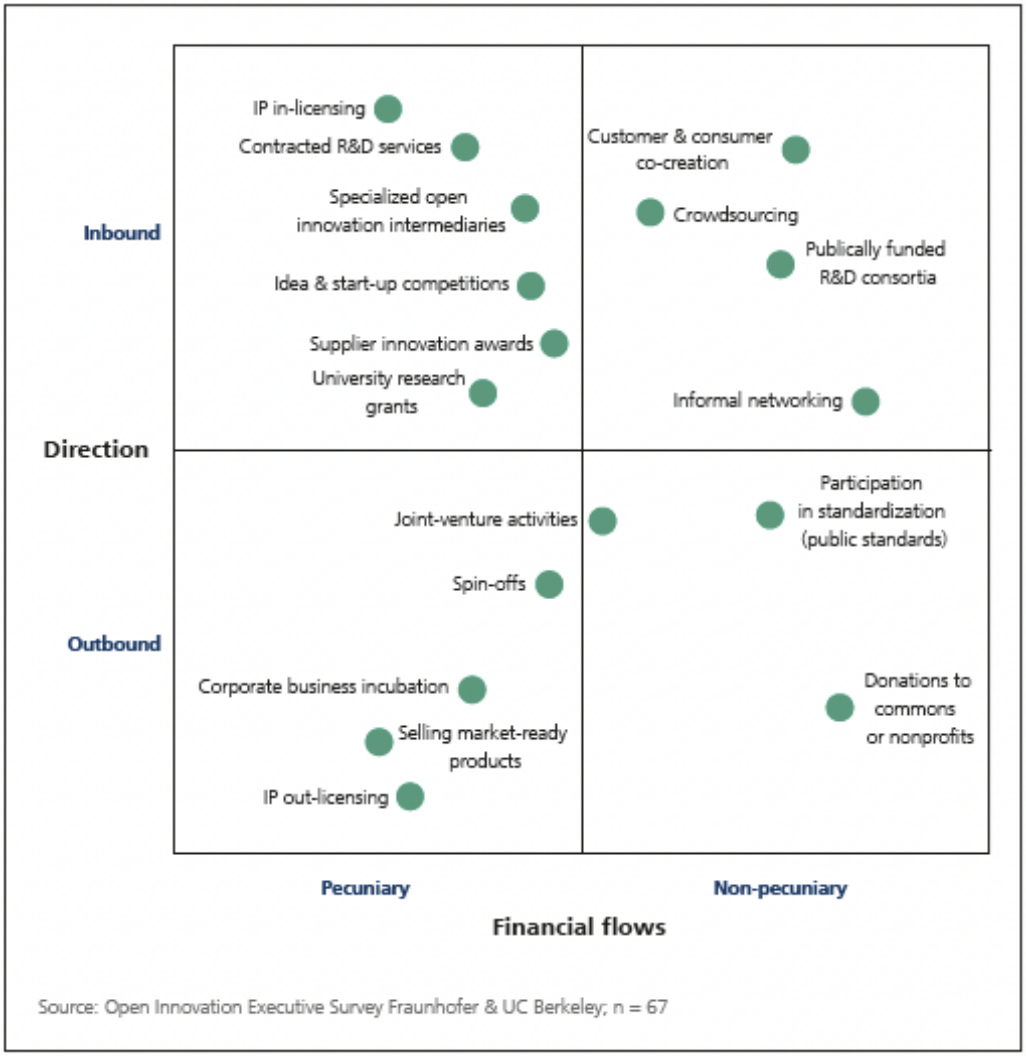


Figure 5. Classification of models of open innovation (Chesbrough and Brunswicker, 2013)

One of the last and the fullest classifications was proposed by Chesbrough and Bogers (2014) which includes division by Inbound, Outbound and Coupled flows with various activities included (Table 3).

OI-Net report (Podmetina et al., 2016) published the data how intensively industries adopt those OI activities (Figure 6). Three the most intensively used activities are in the non-pecuniary dimension: collaborative innovation with external partners (4,4 from Likert scale, where 0 – do not adopt and 7 – very intensively), scanning for external ideas (4,3), customer co-creation in Research and Development (R&D) projects (3,5).

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Table 3. Classification of open innovation activities (Chesbrough and Bogers, 2014)

Outside-in/Inbound open innovation	**Inside-out/ Outbound open innovation**	**Coupled open innovation**
Scouting In-licencing IP University research programs Funding start-up companies in one's industry Collaborating with intermediaries, suppliers and customers Utilizing non-disclosure agreements Crowdsourcing Competitions and tournaments communities Spin-ins or spin-backs	Out-licensing IP and technology Donating IP and technology Spin-outs Corporate venture capital Corporate incubators Joint ventures and alliances	Strategic alliances Joint ventures Consortia Networks Ecosystems and platforms involving complementary partners

2.1.1. Understanding of Open Innovation

According to Podmetina et.al. (2016) *"How companies adopt open innovation and how they identify themselves as open innovation adopters is not always the same thing"*. Even the divergent use of terminology of open innovation varies from "open distributed innovation", "open source innovation", or "open collaborative innovation" (von Hippel, 2005; Baldwin and von Hippel, 2011; Lindegaard, 2010). Thus, it is not easy to identify whether the organization adopts open innovation or not, because a lot of components of open innovation concept already have been existing for a long time in the companies.

Dabrowska and Podmetina (2016) in their qualitative part of research were able to collect the definitions of OI perceptions. Among those *"Harnessing external technologies to supplement internal R&D", "Outsourcing challenges to find solutions for them"* were presented, which both are classified as inbound open innovation only.

Another question of misunderstanding is meaning of "openness", which has been investigating and discussing by the researchers for a long time. The following table includes the main findings on this issue (Table 4). Among the practical analysis the case study research of Dabrowska, Fiegenbaum and Kutvonen (2013) also proved that the gap of the perception of company's openness indeed exists.

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Table 4. The understanding of open innovation openness/closeness by different researchers

Authors
Henkel (2006)
Laursen and Salter (2006)

Understanding of openness/ closeness

Openness: revealing ideas previously hidden inside the organization.
Openness: the amount of the external sources of innovation (external breadth and external depth)

Dahlander and Gann (2007)	*Openness:* three types of openness according to (1) the different degrees of formal and informal protection, (2) the number of sources of external innovation, and (3) the degree to which firms rely on informal and formal relationships with other actors.
Pisano and Verganti (2008)	*Closeness:* an open perspective of selecting the partner or the input type they need (like private clubs) and when the company shares the problem with the few parties it trusts most in terms of having crucial capabilities to provide innovative solutions.
Lazzarotti and Manzini (2009)	Four degrees of openness: (1) open innovator, (2) closed innovator, (3) specialized collaborator, and (4) integrated collaborator. *Openness:* having high partner variety, which impacts the whole innovation funnel. *Closeness:* accesses external sources of knowledge only for a specific reason, in a single phase of the innovation funnel, and usually in a dyadic collaboration.
Barge-Gil (2010)	Three strategies: open, semi-open, and closed. *Closeness:* a company for whom the most important external source is less important than company's internal knowledge and whose innovations have been developed mainly through their own efforts.
Lichtenthaler (2011)	*Openness:* via a capability-centric perspective, defining open innovation as "systematically performing knowledge exploration, retention and

	exploitation inside and outside an organization's boundaries throughout the innovation process."
Kortelainen, Kutvonen, Torkkeli (2012)	*Openness:* dynamic resource-based view of OI strategy where the novelty of the concept is limited to cases in which knowledge exchange is directed to inbound and outbound flows of knowledge as opposed to static knowledge stocks, which are sufficiently informed by transaction cost economics (TCE) theory.
Lakhani et al. (2013)	*Openness:* "problem solving needs and knowledge flow both inside and outside the firm via interaction with multitudes of external actors who could be embedded in communities or participating in innovation platforms."

2.1.2. Open Innovation Criticism and Challenges

There are two main points of view in terms of open innovation criticism. Some authors (e.g. Dahlander and Gann, 2010; Knudsen and Mortensen, 2011; Ozman, 2011; Piller and Walcher, 2006; Groen and Linton, 2010; Oakey, 2013; Trott and Hartmann, 2009; Mowery, 2009; Chandler, 1990; Freeman, 1974; Pavitt, 1984; von Hippel, 1986) claim, that the concept is not already new and the open companies' boundaries have been under the research for a long time. Open innovation was also called "Old wine in new bottles" (Trott and Hartmann, 2009). Another point is that open innovation can even be an obstacle to develop other existed theories (Groen and Linton, 2010). Also, Enkel et al. (2009) argue that excessive openness can lead to control and core competences loss in the long term. While Elmquist et al. (2009) state on the negative sides of OI above the positive ones.

However, Chesbrough and Burgers (2014) substantially reply to this criticism. In addition, the fact that the statistics on rising interest in open innovation is growing dramatically cannot be neglected.

As was mentioned by Trott and Hartmann (2009) and Oakey (2013), having several definitions and classifications of OI, leads to misunderstanding of OI and its activities on practice. That makes the research and the implementation of OI more difficult as the researches show the significant difference in the perception of OI (Dabrowska et al., 2013).

There are possible challenges that are connected with OI process (Elmquist et al., 2009; Giannopoulou et al., 2010; Mortara and Minshall, 2011):

- - Maximizing returns to internal innovation;
- - Identifying and incorporating external knowledge into the firm's assets;
- - Motivation and managing of external sources for contributing company's Intellectual

  Property (IP);

- - The need of development of organizational capabilities inside the company to manage OI

  process;

- - Culture: national (Savitskaya et al., 2010; Chesbrough and Crowther, 2006), regional

  (Tödtling et al., 2011), internal - including Not Invented Here syndrome (NIH) - inability to implement an idea because it comes out of the company's boundaries (Cohen and Levinthal, 1990) and Not Sold Here syndrome (NSH) – "a tendency, which result from protective attitudes in firms toward the external exploitation of knowledge" (Lichtenthaler, Ernst, and Hoegl, M., 2010, 1055)

- - Internal R&D capacity, set of OI capabilities like absorptive capacity - the capability to create, transfer, assimilate, transform and exploit knowledge, is critical for a firm's competitive success

(Cohen and Levinthal, 1990; Zahra and George, 2002; Berchicci, 2013; Cassiman and Veugelers, 2006; Lichtenthaler and Lichtenthaler, 2009; Bogers and Lhuillery, 2011);

- - Balance between the degree of correct openness and closed innovation (Enkel et al., 2009; Laursen and Salter, 2006; Salge et al., 2011).

From the other hand, several OI enablers have been mentioned also: (1) IT systems and infrastructure (Dodgson et al., 2006; Chiaroni et al., 2011; Kuschel et al., 2011), (2) management tools like taxonomies (Di Minin et al., 2010) or *watch lists* (Mortara et al., 2009; Tao and Magnotta, 2006), (3) virtual platforms (Bughin et al., 2008) and (4) leadership, political climate and internal dynamics of power (Pye and Pettigrew, 2006).

2.1.3. Implementation of Open Innovation in Industries

In 2016 OI-Net published an executive report with the current situation of OI distribution among European industries. The results showed that 61,5% of companies consider themselves as OI adopters, 16,3% are planning to adopt OI in the nearest future (planners) and 22,2% of companies are not going to do that. The average majority of adopters are at the early stage of OI implementation (29%) (Podmetina et al., 2016).

Since introduction of the term, open innovation became immediately supported by such companies as: IBM, BMW, P&G, Natura, GE, General Mills, Philips, DSM, AkzoNobel, Siemens and others (Dabrowska, Fiegenbaum and Kutvonen, 2013).

According to the survey, the beneficial results from adopting OI have been noticed in the last three years: ROI increase (62%), acceptance of innovations by market increase (68%), success of radical innovations improved (76%). Although, the risks are also increased (59%) and the product development time became longer (56%). The beneficial impact

of OI like product development, innovative performance and market success chances increase was also proved by the researchers (Cassiman and Veugelers, 2006; Chesbrough et al., 2006; Laursen and Salter, 2006; Leiponen and Helfat, 2010).

Dabrowska and Podmetina (2016) conducted a research of the different perception and reality about adoption of OI activities. They found the most common activities of adoption are: collaborative innovation, scanning for new ideas, using external networks and customer co-creation in R&D projects. Furthermore, the least adopted activities are: IP out licensing, IP in licensing, selling unutilized technologies, crowdsourcing and free revealing of ideas and IP to external parties.

The three common recognized by companies OI activities were identified: (1) idea and start-up competitions, (2) subcontracting R&D, (3) free reveling. Other activities were not recognized in the common scale.

The implementation process of OI has been mostly observed applying to the large companies. Thus, Mortara et al. (2009) evidence that the implementation of OI usually is a strategic top-down approach, starting with development and implementation of OI strategy (Figure 7). The

responsibility of OI implementation is either centralized with OI team or

spread over several departments.

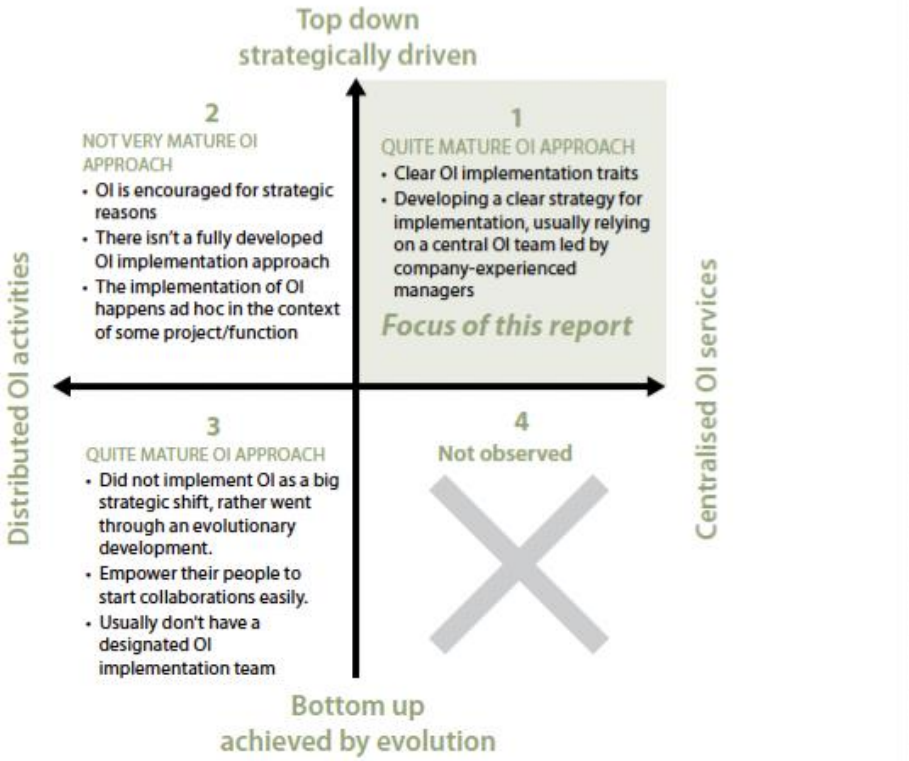


Figure 6. The OI strategy matrix: general characteristics of the approaches taking by companies adopting OI (Mortara et al., 2009)

Mortara and Minshall (2014) research about OI implementation approaches in MNCs and distinguish two levels of features that can be used to describe this process: macro characteristics and micro characteristics.

Macro characteristics are specified by (1) process – inbound, coupled, outbound, (2) internal change stimulus – top-down and bottom-up, (3) coordination – decentralized and centralized, (4) approach to location – "go to key places" or "come to me", (5) networks – types of partners.

Micro characteristics are described by observing: (1) implementers – OI implementations teams, top-management, etc., (2) divisibility –

incremental implementation, (3) social interactions – communication, PR, training, recruitment and other implications of OI.

In micro characteristics of social interactions Mortara and Minshall (2014) directly emphasize the need of further work in the Human Resource management issues regarding OI process. Because the way of recruiting and the required skills will be different for OI companies. They ask a

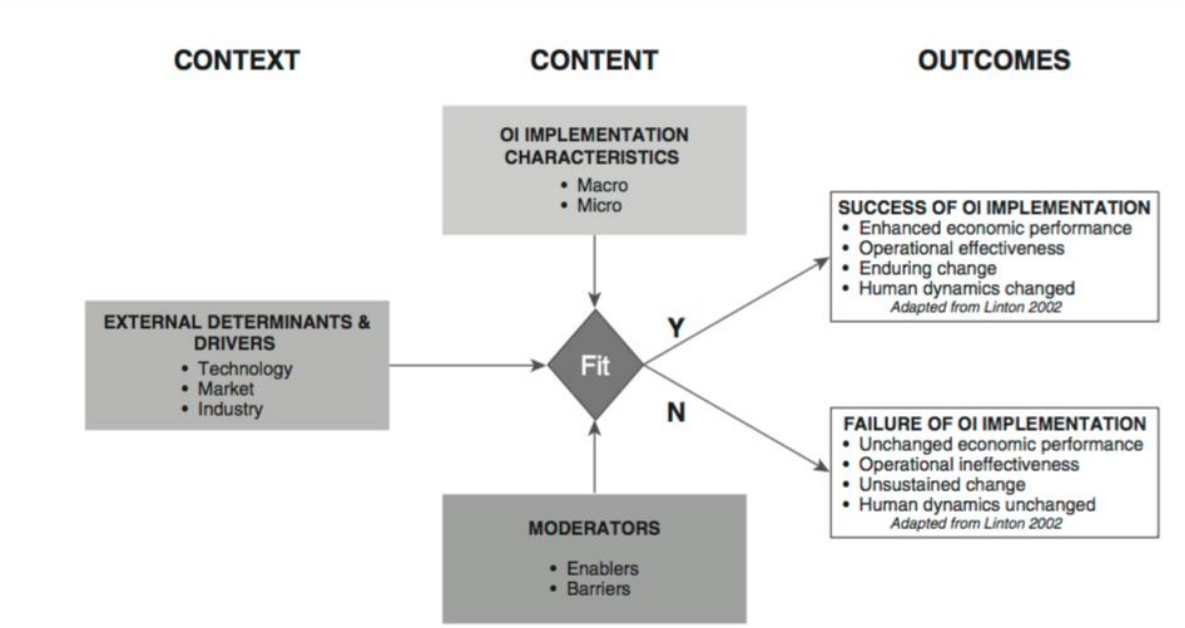
question “How are the HR practices changing because of the implementation of OI?" which is relevant within this research also.

There are several external factors associated with OI implementation: turbulence (Schroll and Mild, 2012), technology characteristics like appropriability and uncertainty (Buganza et al., 2011), industrial systems of innovation and ecosystems dynamics (Christensen et al., 2005). Another factor is different industries need different time scale to shift from closed to open stage (Poot et al., 2009).

Linton (2002) found four levels for OI implementation assessment: (1) implementation, integration and institutionalization (Chiaroni et al., 2011) in terms of changing the work performance, (2) human partnership dynamics in terms of changing the nature of company’s structure and employees’ interaction, (3) economic performance in terms of performing quantifiable economic indicators by innovation and (4) operational effectiveness in terms of improving the operations in qualitative measurements.

Figure 8 presents an OI implementation framework by Mortara and Minshall (2014) based on the findings above.

Figure 7. An open innovation implementation framework (Mortara and Minshall, 2014)



2.2. Human Resources and Organizational Practices 2.2.1. Human Resources Function

The term human resources (HR) has been first mentioned by economist John R. Commons in his book *The Distribution of Wealth* in 1893 but he did not develop it further. The term HR with its modern meaning was mentioned and explained by scholar E. Wight Bakke in the essay The *Human Resources Function* in 1958 (Kaufman and Bruce, 2008). Bakke (1958) first called HR function as *an organized activity*. Also, he claims that human relations is not a new function but always has been under the consideration of managers from the first day by such issues as dealing with people, arranging their conditions, understanding what makes them *tick*, applying rewards and punishments, maintaining and developing their capacities.

In his essay *The Human Resources Function* (1958) Bakke explains that human or personnel relations appeared as the latest layer of general management that is why it sounds like “new names” but it has been always existed before as long as management itself.

Bakke (1958) pays attention that the general aim of management is “to use resources effectively for an organizational objective” (Bakke, 1958:5). Among the mentioned resources are: money, materials, people, ideas, market and nature. Weak maintenance of at least one of the resources will affect and weakens other. In this logic, people are needed to pay attention on and the human resource function by Bakke (1958) means the understanding, maintenance, development, effective employment and integration of the potential of people. He also emphasizes that “attention to human resources is required not because managers are humanitarians, but because they are managers” (Bakke, 1958:7).

Onwards, Bakke (1958) gives the explanation of how to manage the six mentioned resources effectively. He stresses that the general types of activities that are required for these six resources are the same:

- - To know realistically and potentially the nature, potentialities, constrains and conditions of employment in the resource;
- - To understand and maintain the adequate quality and quantity of the recourse for the company;
- - To develop and extent possible potentials and opportunities for the resource;

- - To employ or utilize the resource for the optimal level for the effective company’s work;
- - To integrate all the efforts and the recourses to achieve the desired result.

  Generally speaking, these tasks are related to (1) discovery and understanding, (2) maintenance and development, (3) utilization and employment, and (4) integration of the resources. Bakke (1958) also observes the Human Resources task particularly (Table 5).

Table 5. Human Recourse function (Bakke, 1958)

Managing category	**Human Resources Tasks**
Discovery and understanding	• - To obtain and update the information about the skills and capacities of people in the company; • - To evaluate continuously the abilities and performance of employees at all levels and have this information available whenever the decisions about the personnel are taken; • - To obtain and have the information of the employees' reaction on the company's policies and practices, their needs and demands on all levels of the company and to understand the significance of such human reactions and needs for the company's operations; • - To understand people reactions on company's motivation and discipline policy (psychological conditions for the encouragement and assurance of productive and profitable work); • - To contact with and understand the key-norm-setters and unions that will affect the employees; • - To make the studies about the incentives, wages, hours, working conditions and benefits in the industry and evaluate company's policy about these categories; • - To keep track of labor legislation and to estimate the company's actions in accordance with it;

	• - To keep in track local and national labor trends and to interpret these trends for the company's operations; • - To keep in track other findings from outside research of tendencies and needs on all the levels of employees.
Maintenance and development	• - To find out the short run and long run labor requirements (numbers and skills) of the company are; • - To investigate available resources of labor supply inside and outside the company in terms for the necessity of personnel; • - To recruit, screen, and select candidates for positions in the company; • - To introduce and orient new employees; • - To develop and administer the procedures for transfer, promotion, demotion, layoff, and discharge; • - To develop and implement procedures for reduction of turnover, absenteeism, tardiness and etc.; • - To organize and administrate training and development programs (internal and external) at all levels for performing and promote the potential candidates for internal growth in other positions;

	• - To establish and administer health and safety programs; • - To establish and maintain benefit programs to serve the company's people.

Utilization and

- To plan, formulate, update, and implement HR policy for all levels in accordance with the responsibility and authority of employees;

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employment	• - To formulate long term and short term range of goals for staff development and improvement with indicating of schedules, budget, facilities, etc. required for implementation; • - To define and analyze the jobs and work assignments in a way to discover maximum abilities of people (the foundation for all HR practices); • - To provide wise assignment of people for leadership, supervision and control of the work; • - To arrange the incentives and rewards for the greatest motivation and productive work of the employees and to evaluate this effectiveness; • - To provide the rules for discipline and correction of mistakes; • - To handle the complaints at all levels in terms of work relations and work conditions;

	• - To create opportunities for upward communications for contribution of suggestions and ideas about work and morale improvement, waste elimination, reduction of conflicts, better cooperation and etc.; • - To keep union-management relations; • - To keep in track, evaluate and check the effectiveness of implemented policies, measures and other indicators and to report this to the President of the company; • - To clear up and control the cost of HR programs and its results to the company.
Integration of the resources	• - To assist the establishment of integrating goals of the company as a whole; • - To assist the establishment of effective mutual communications between the people at different levels with different functions; • - To contribute to major decisions of the company in terms of understanding the human factors needs affecting and affected by these decisions. To represent the HR interest in decision making, operations, and results evaluation; • - To manage people who perform other managerial functions and to help them to

	interpret the policies and practices for their activities and responsibilities; • - To participate different associations and government relationships where the HR function is a major issue or concern.

However, Bakke (1958) does not aim a special group of people that should manage HR function but he emphasized the necessity to manage this function for its sake whenever it will be managed by already working people or some new hired specialists. Though, the main target of HR is productive work and identifying and developing maximum of everyone's abilities to achieve that productive work.

HR covers several most common areas in the organization: HR planning, recruitment and selection, adaptation of new employees, training and development, performance appraisal, rewards and disciplinary politics, motivation, safety policy (Figure 9). These areas match with Bakke's understanding of HR function but not fully. However, Brewster et al. (2006) proved that HR and its functions depend on organizational size, sector and national context.

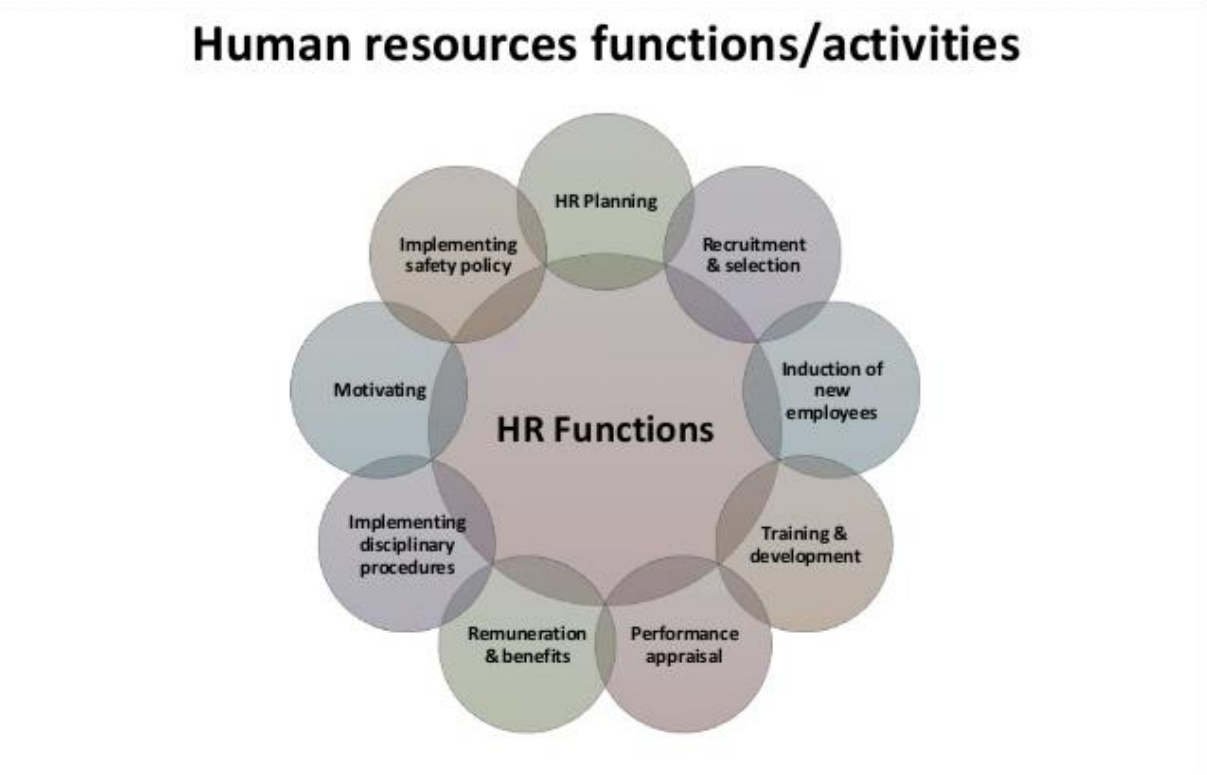


Figure 8. Human resource functions/activities (Safi, 2013)

Nevertheless, Foss and Laursen (2012) give HR the role of the key success factor in the organization. HR management based on investing in human capital, rewarding employees for performance and their new ideas and enhanced teamwork have been emphasized as an essential part of innovative culture by Black and Lynch (2001), Fu (2012), Laursen and Foss (2003). Caliskan (2010) states HR as a source of opportunities that can give competitive advantage to a firm. HR becomes a catalyzer of innovations in organizations and managers should operate which HRM practices to use (Maier et al., 2014).

As OI is an upcoming tendency, the tendencies of HR are also needed to be considered for the possible correlations. Thus, the report of World Economic Forum on the Future of Jobs (WEF, 2016) was examined. It corresponds HR function is going to undergo changes. Thus, recruiting will become a more sophisticated process as the competition for talents will rise immensely. Consequently, the role of HR is changing towards "proactive and innovative skill-building and talent management" (WEF,

2016:29). HR function needs to be strategic and operate with analytical tools to provide the insights and maximize employees' efficiency. The use of talent platforms and social media communities is growing and the future jobs will be done mostly with freelancers and individual workers. Lifelong learning will become a usual practice. Therefore, to make these changes, the knowledge of change management is also required.

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Figure 9. The Five Ps model of organizational attributes (Margolis, 2016)

2.2.2. Organizational Practices

Surprisingly, there is not much structural information about organizational practices in the literature. Verbeke (2000) also admits the lack of attention to organizational practices in the literature.

Kostova and Roth (2002: 216) find the definition of organization practices as "an organization's routine use of knowledge for conducting

a particular function that has evolved over time under the influence of the organization's history, people, interests, and actions."

Margolis (2016) use the Five Ps model to describe organizational attributes where she divides organizational practices on internal and external groups (Figure 10). Such division is also mentioned by Verbeke (2000) as organizational practices are influenced by internal and external environment. According to Margolis (2016) organizational practices are located outside the core culture and they help to keep the core culture with their ideas transferred to actions. Glisson and James (2002) and Hofstede (1998) say that organizational practices is the visible side of organizational culture.

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Internal organizational practices should be aligned with the core culture as they are connected with the employee relationships, interactions, accomplishments, organizational structure, job titles, work organization, recruitment and selection, training and development, performance management and technology (Figure 11).

External organizational practices are defined as “not employees” interactions: customers and markets, offered products and services, suppliers, vendors and partners (Figure 12).

Margolis (2016) notes that core culture principles should be infused in those external and internal practices and demonstrated by the employees and leaders. Otherwise, cultural principles are meaningless without those practices as the practices will not sustain core culture principles respectively. Hence, the employees “learn” organizational culture by organizational practices daily and vice versa, organizational culture dictates organizational practices to mold required behaviors and attitudes of the employees (Hofstede, 1997; Ogaard, 2006; Singh et al., 1996; Tuomi et al., 2004; Verbeke, 2000).

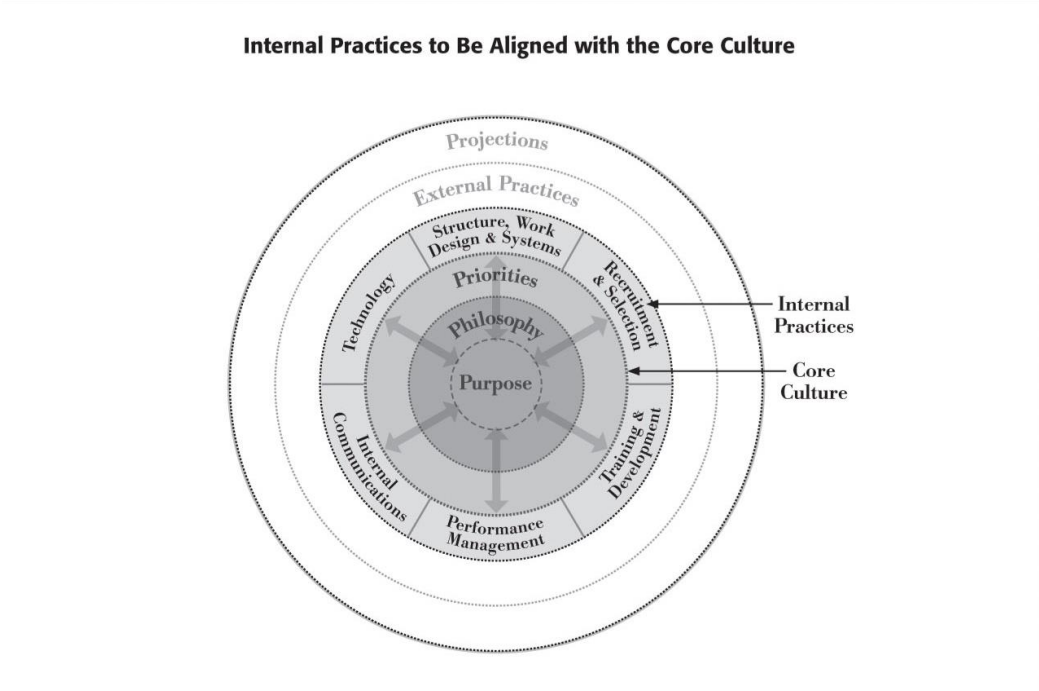


Figure 10. Internal organizational practices (Margolis, 2016)
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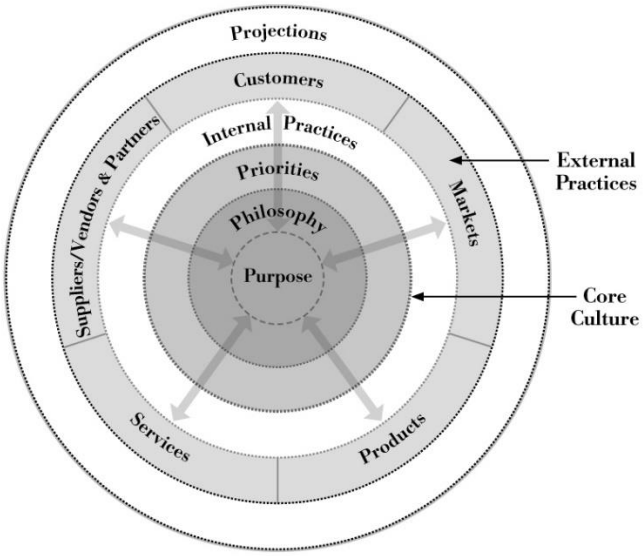


Figure 11. External organizational practices (Margolis, 2016)

In a personal e-mail interview (Margolis, 2016) Margolis explains that HR practices has impact on Internal practices mostly, on such functions as: selection and retention, on-boarding, training, development, performance management, work design and internal communications. Thus, HRM practices is a subset of Internal practices which is subset of Organizational practices.

2.2.3. Human Resource Management practices

As previously was mentioned by Margolis (2016) HRM practices are directly interconnected with the company's core culture and are needed to support and maintain it. McLean (2005) raises the discussion of difference between *organizational culture* and *organizational climate*. Reviewing the authors, Martin (2002) defines organizational culture as "deeply held assumptions, meaning and beliefs". Schein's (1992) describes organizational culture as an iceberg model *under the waterline*. Whereas, organizational climate is understood by basic assumptions, values, informal practices and behavioral norms McLean (2005). According to that, culture is a broader concept than climate.

Generally speaking, HRM practices are represented internally the organization by such dimensions as recruitment and selection, training and development (Biemans, 1995), career management,

reward systems (monetary and nonmonetary) (Stathakoloulos, 1998), employee involvement, and recognition (Podmetina et al., 2013). These groups consist of different HRM practices that have certain effect on the components of organizational performance.

Thus, Jackson and Schuler (1987) explained HRM practices as a system for attracting, developing, motivating and retaining employees for keeping the organizational performance. Delery and Doty (1996) note that HRM practices are designed for insuring that human capital adds to the achievement to the business aims. Minbaeva et al. (2009) see HRM

practices as a facilitator of competency development and generator of organizational knowledge for competitiveness of the firm. Shahnaei and Long (2015) conclude that HRM practices lead to attracting, developing, motivating and retaining employees for the effectiveness of organization's functioning.

The researchers found that HRM practices can affect employees' knowledge, skills, abilities, motivation, effort and opportunities, which, all in all, can affect their performance on strategically relevant activities, such as their knowledge transfer behaviors (Jiang, Lepak, Han, Hong, Kim and Winkler, 2012). There are even high-performance work systems (HPWS) that can affect firm's performance significantly (Huselid, 1995).

The results of influence of HRM practices are found also in innovation performance (Laursen and Foss, 2003), productivity, flexibility, efficiency, financial significates (Collins and Clark, 2003; Delery and Doty, 1996; Ichniowski et al., 1997; MacDuffie, 1995; Mendelson and Pillai, 1999; Youndt et al., 1996).

The findings from the literature review are combined and presented in Figure 13.

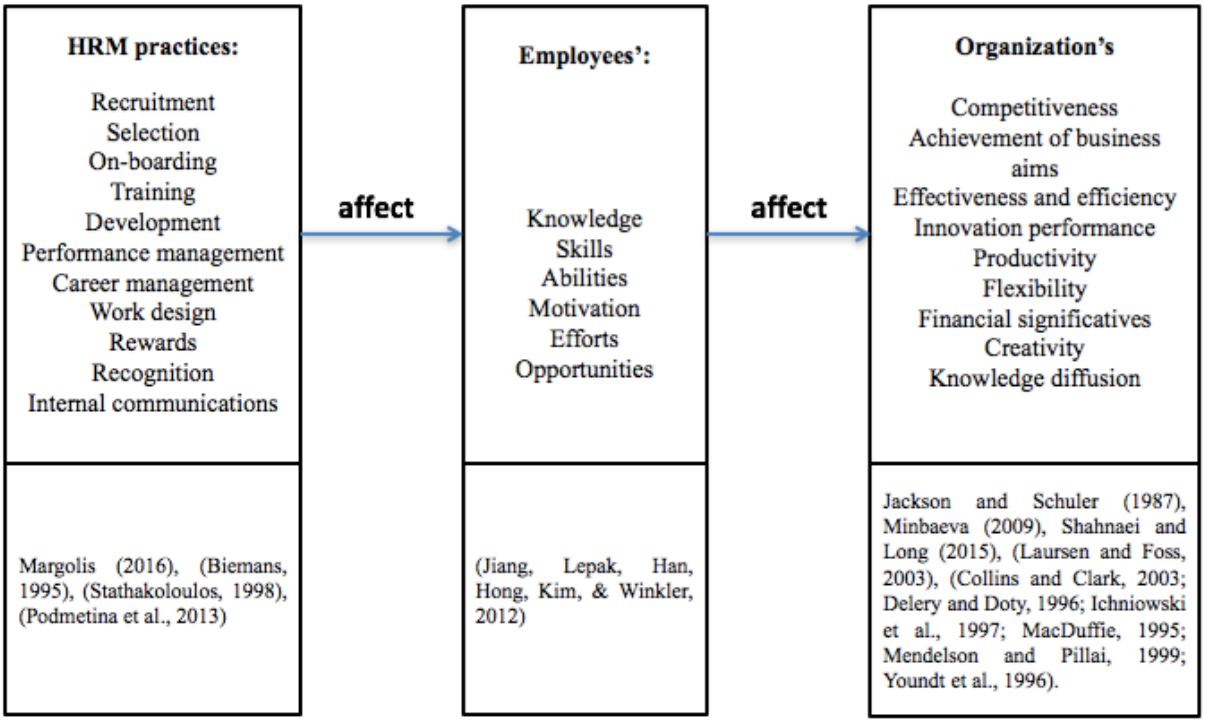


Figure 12. Model of the influence of HRM practices on organizational performance

The two theories are mostly related to HRM and performance are Resource Based View (RBV) (Grant, 1996; Wright et al., 2001; Barney, 1991) and Ability Motivation and Opportunity (AMO) by Paauwe and Boslie (2005). RBV states that HR is a firm's resource and it helps to enhance specific competencies and knowledge, and discover new opportunities in innovation. AMO states that the organization performance depends proportionally on employees' motivation. In this way, HRM practices help to motivate people and generate their abilities to produce innovations (Tan and Nasrudin, 2005). The findings of HRM practices with influence on *organizational performance* are combined and represented in Table 6.

Table 6. HRM practices and its influence on organizational performance

Organizational performance	**HRM practices**	**Authors**

Innovation performance (technical, product, process, administrative innovation)

- Creating of innovative climate;

- Enabling of innovation mechanisms: promotion, development and management of new ideas, projects and business;

Ekvall (1996), Isaksen and Tidd (2006) and Kanter (1983); Van de Meer and van Zwieten (2010)

Van de Meer (1996)

- Appraisal of performance, recruitment, system of compensation and internal and external training;	Jimenez and Valle, (2005); Tan and Nasrduin, (2011); Jaw and Liu (2003); Brockbank (1999); Nonaka and Takeuchi, (1995)

31 Involvement of individuals and organizational flexibility;

Financial reward and public recognition;

Any kind of monetary or nonmonetary motivation;

Internal and external communication frequency with different points of view;

Intrinsic motivation.

Michie and Sheehan (1999), (2003); Lund (2004 a,b)

Cano and Cano (2006); Camelo- Ordaz et al. (2008)

Schuler and Jackson (1987); Mumford (2000)

Angle (1989); Utterbach (1971)

Angle (1989) MacDuffie(1995)

Y oundt et al. (1996)

Productivity

- Hiring, compensation, status barriers, and training;

- Staffing, training, performance appraisals, and compensation;

- Extensive measures (incentive pay), recruitment and selection, teamwork, flexible job assignments, communication and training, employment security.

Ichniowski et al. (1997)

- Goal emphasis, means emphasis, reward orientation, task support, and socioemotional support;

Tesluk, Farr, and Klein (1997)

Creativity

- - Organizational encouragement, supervisory encouragement, work group supports, freedom, sufficient resources, challenge;
- - Expertise domain, creative-thinking and intrinsic motivation.

Amabile et al. (1996); Angle (1989)

Knowledge diffusion

- Rewarding creativity, problem-solving and risk- taking appraisal

Argote et al. (2003); V on Krogh (1998)

2.3. The role of Human Resources in Open Innovation process

The scholars and researchers mention the gap concerning the role of HR practices and HR professionals in open innovation (InnovationManagement, 2013). Thus, Golightly (2012) foresees the further potential in human side of OI, especially in HMR practices. Harwood (2010) also determines open innovation is a process of *people dealing with people*. Du Chatenier et al. (2010) and Lichtenthaler et al. (2011) even call individuals as "the driving force" of OI success. InnovationManagement (2013) concludes the necessity to investigate how HR practices including internal and external talent management through organizational climate and culture could influence on OI success (Figure 14).

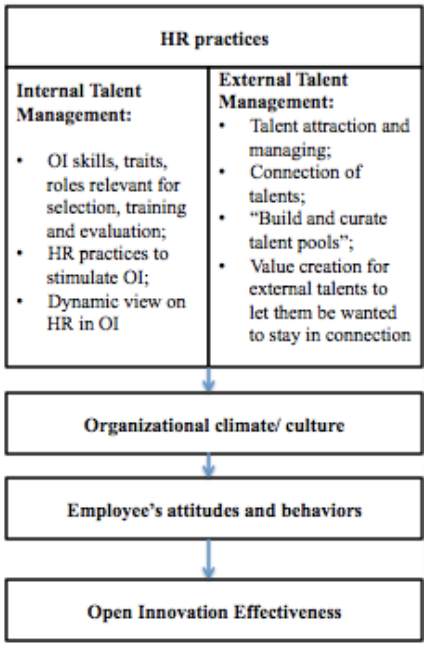


Figure 13. The relation between HR and OI effectiveness (InnovationManagement, 2013)

Thus, du Chatenier et al (2010), Mortara et al (2009) claim that HR needs to select and train people for OI based on particular skills. Wagner and Piller (2012) and Golightly (2012) add the necessity of capacities and capabilities. Mortara et al (2009) stress training as essential part to prepare company for OI. Some researchers as Thoen (2011) and Sloane (2012) emphasize the need of balance between soft skills and hard skills, so it is important not only what people are doing but how.

Among the required OI skills Thoen (2011) lists: breadth and depth of specialization, technical, organizational and business masteries, entrepreneurship, internal and external networking, ability to change, tolerance to uncertainty and risk taking, ability to learn quickly, optimism, passion and energy, ability to see the big picture and be a team player.

In regard to HR practices, Donkor and Monti (2010) claim about stimulation of changes, creation of relations, exchanging of ideas, acquisition of external knowledge, creation of interdisciplinary knowledge in employees, etc. Petroni et al. (2012) see HR practices in the opportunities to choose the career and research paths and with Harryson (1997) they offer for all future managers and talents to start in R&D department to have this knowledge for better comprehensive picture of all the organization. Although, Lindegaard (2010) notifies about a dynamic approach that different skills are needed in different phases of OI process. Also, Mortara et al. (2009) argue that it is impossible to have all the necessary skills in one person, therefore different people with different set of skills and approaches are needed to be involved on different stages of OI activity.

Grant (1996) emphasizes that the role of the company is to integrate the knowledge existing among the employees and to create the atmosphere where the individuals can cooperate and create new knowledge for the company’s competitive advantage.

Summing up, Kelley (2012) predicts the role of HR professional in OI company in building “new core competences in network orchestration and managing talent” in its any habitation. Mattes (2011) is sure that HR have to reconsider its role in following steps:

- - Establish Chief Talent Officer;
- - Engage in internal and external innovation networks and contribute to its’ design and

  adoption;

- - Support OI implementation by leadership in culture change;
- - Drive OI in all processes of the company’s business;
- - Consider leadership as the needed requirement on top-management positions;
- - Bring OI aspects in redesigned structures and processes;
- - Track existing and design new OI training and coaching programs.

  Clausen (2013) claims that training of the personnel is a key factor for OI approach. Teirlinck and Spithoven (2013) investigated the requirements necessary for internal R&D *in SMEs* and found the correlation between the knowledge share of R&D employees who have PhD degrees and engagement in external research cooperation. As well as positive effect of R&D training.

  Mortara et al. (2009) stress four main issues that companies should analyse in terms of top-down adoption of open innovation inside the company: *culture, procedures, skills, and motivation.* As this is a top-down process in the company there is “the open innovation implementation team” (OIIT) that is responsible for OI implementation. The OIIT looks through what kind of individuals should be inside this team and what kind of individual skills should appear in the company as a result of OI adaptation; what HRM practices should be used; and what are the other aspects of

innovation performance inside the company with a top-down approach.

On the managerial level, there are plenty of studies proving the correlation between the adoption of HRM practices and exploitative innovations when these practices facilitate the knowledge sharing (Volberda et al., 2001; O'Reilly and Tushman, 2004). According to Mortara et al. (2009) the main goal of OIIT is to find the processes that should be connected and what tools and resources are needed to bond these processes. The second goal is to create a knowledge sharing

platform. Finally, the employees with diverse skills should be trained instead of hiring or teaching special OI masters. In other words, the open innovation Culture should be created.

For example, an internal *Open Innovation Academy* could be organized to train the employees. Training could be obtained in different formats: e-learning, seminars, personal development plans, courses, mentoring and tutoring and others. Training is needed for OIIT also. This collected knowledge could be provided to other companies later in terms of OI policy and promotion.

Santangelo and Pini (2011) stress the importance of HRM practices at the lowest hierarchical level of the firm due to couple of reasons. First, the literature review shows the significance of employees' creativity (Nijhof et al., 2002; Brennan and Dooley, 2005). Secondly, the adoption of HRM practices has a good impact among production level workers (Batt, 1999). HRM practices regarding to innovation performance influence the internal structure of the firm in the ways of binding weak ties, formulating norm of reciprocity, sharing ideas among the workers (Evans and Davis, 2005); authority decentralization processes, participation in decision-making, bureaucracy avoidance (Luchsinger and Bagby, 1987); and again better problem solving by delegating the

autonomy rights to the shopfloor level, extended financial performance (Laursen and Foss, 2003).

The great example of active HRM practices to activate incremental and exploitative innovations on shop floor level is Japanese model. Among these practices are: promotion of employees' involvement, responsibility, autonomy, active participation in daily problem-solving of production process, constant teamwork, increasing knowledge diffusion through intra-task learning and job rotation (Aoki and Dore, 1994).

The adoption of HRM practices on the shop floor decreases the level of bureaucracy in the firm which contributes to entrepreneurial opportunities generation, that leads to increase of productive capabilities and exploitative innovations appearance inside the firm (Sørensen, 2007; Ozcan and Reichstein, 2009; Santangelo and Pini, 2011).

There are plenty of mechanisms, ranging from the recruitment to job rotation that can influence the job of open innovation specialists. Bianchi et al. (2011) find three of them for outbound licencing (Huselid 1995; Foss and Laursen 2005; Pries, Chowhan, and Mann 2009)**:** (1) Delegation of decision rights: Positive effect of individual characteristics is strengthened in presence of high delegation and appropriate rewarding practices; (2) Incentive systems: Intrinsic rewards are more effective motivators for licensing managers than extrinsic incentives; (3) Training programs: No

evidence about training programs probably because of specific of Outbound OI where experience is much more comprehensive.

Thus, for outbound licensing process the best HRM practices would be the combination of intense social network, high level of delegation and powerful intrinsic rewards. Licensing managers "are more strongly motivated by attractive career paths and challenging intellectual

assignments, than by performance-based payment plans" (Bianchi et al., 2011).

Podmetina et al. (2013) conducted a research on the personnel influence on the openness of organization. The findings are following: there is a positive influence of HR learning and training practices, big value of human capital and need of HR motivation on external technology sourcing; the companies with OI approach invest in training and teaching their employees more than the closed companies to gain external cooperation; the significant impact of HR practices in cross-functional R&D cooperation has been found; also positive correlation between HR learning and training practices and internal knowledge exchange has been proved.

Among these HRM practices Minbaeva et al. (2005) excrete staffing, training, promotion, compensation and performance appraisal affected the degree of knowledge transfer. Also, selection, training, performance appraisal and rewards can foster international assignees' motivation for knowledge transfer. While practices such as socialization, equity-sensitive compensation schemes and collaborative working conditions can foster better relationships between international assignees and host nationals to encourage knowledge transfer (Bonache and Zárraga-Oberty, 2008). However, the transfer of knowledge and knowledge sharing start with building trust and friendly culture inside the company (Bell and Zaheer, 2007; Mäkelä and Brewster, 2009). HRM practices can affect relational configuration, the relationships between employees that strengthen their networks, foster coordination, build mutual respect and improve communication (Collins and Clark, 2003; Gittell et al., 2010). Among net-work practices Collins and Clark (2003) found expense accounts, training, and financial incentives for fostering jobrelated relationships and performance management with networking accountability. Cross- functional coordination is connected with such practices as selection and rewards for teamwork, cross-functional performance measurement, conflict resolution mechanisms, and cross-

functional work and meetings designed for boundary spanning (Gittell et al., 2010).

Minbaeva et al. (2003) emphasize the importance of HRM practices in multinational corporations (MNCs) in enhancing employee's ability and motivation for knowledge transfer and knowledge sharing between the subsidiaries. Among the effective HRM practices are: training, performance

management, merit based promotion, performance-based compensation and internal communication (Table 7).

Table 7. HRM practices for knowledge transfer in MNCs (Minbaeva et al., 2003)

HRM practice	**Description**	**Authors**
Importance of Mentoring	Mezias and Scandura, (2005): Reiche (2011) and IBM Global Mentoring Program (IBM, 2013).	
Training and development	• - Knowledge transfer through training can be designed to enhance employees' communication skills, team-building behaviors and cross-cultural skills, and it can also increase employees' self- efficacy to transfer knowledge; • - Cross-cultural competences can be improved by international assignments.	Bonache and Zárraga-Oberty (2008); Cabrera and Cabrera (2005); Gagne (2009); Caligiuri and Colakoglu (2007); Caligiuri and Tarique (2012); Mendenhall, Reiche et al. (2012); Caligiuri (2014).

	Unilever has such global teamwork.	
Performance Management and Rewards	• - Employees that have been rewarded for their relationship-promoting behaviors like networking or teamwork were more likely to engage in knowledge transfer; • - The collective performance as a greater lead to knowledge sharing; • - Openness, acceptance and respect in teams accumulate knowledge creation (if they create psychologically safe communication climates in global teams).	Collins and Clark (2003), Gittell et al. (2010); Fey and Furu (2008); Choo, Linderman and Schroeder (2007); Gibson and Gibbs (2006), Cabrera and Cabrera (2005).
Job design	- Structuring assignments and jobs with knowledge transfer in mind for example, increasing of social integration in international assignments of global teams can facilitate the knowledge sharing and foster maximum amount of cross-national knowledge transfer.	Bonache and Brewster (2001); Mäkelä and Brewster (2009).

2.3.1. Organizational practices and capabilities required for Open Innovation

Organizational capabilities are highly needed if the company tends to be innovative and wants to change constantly. Hafkesbrink et al. distinguish several dynamic capabilities for organizational change as "abilities to

overcome routines, philosophy of constant change, self-organization abilities, continuous organizational learning" (Hafkesbrink, 2010: pp.262).

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OI-Net research analysed OI organizational capabilities of the companies from the perspectives of what organization does to foster OI and how the company operates. The findings are divided by company's size (Large, SMEs, Micro) and by company's status (Adopters, Non-Adopters, Planners) (Podmetina et al., 2016).

The results show that Micro companies put more efforts to foster OI than Large and SMEs, though still all companies do not pay much attention on organizational capabilities. The top-management support is higher in SMEs and Micro companies than in Large companies. Still, training and collaborative tools and methods are not developed enough. Also, SMEs and Micro companies already accept OI processes, however Large companies have some difficulties with "accepting external ideas", "positive attitude of using company's technologies by other companies" and "opening the borders for knowledge exchange". On the contrary, Micro companies are leading in all functional capabilities.

Organizational capabilities find the realization in OI practices. Based on the Multi-Dimensional Framework of Organizational Innovation proposed by Crossan and Apaydin (2010) open innovation practices from case studies have been revealed by Torres et al. (2015). The model of Crossan and Apaydin (2010) consist from three levels of innovation determinants: Leadership, Managerial Levers and Business Process. Torres et al. (2015) combined found case studies and distributed them to the Multi-Dimensional Framework. The following Table 8 is a result of work by Torres et al. (2015) on the variety of open innovation practices.

Table 8. Open innovation practices Torres et al. (2015)

Dimension Practices

Leadership

- A chief officer who manages open innovation process.
- The innovation manager is involved in the integration of external technologies or ideas.
- The innovation manager manages relationships with knowledge partners. - The R&D managers perform the strategic plans of technology and innovation.

Structures & systems

- Group, unit and individual within the company that manages specific aspects of open innovation.
- Relationships and collaborations with other organizations
- Open innovation's technological tools.

- Flexible business units with flat hierarchies.
- Open innovation activities centralized in R&D units.

Organizational learning & knowledge management

- Organization and/or participation in fairs, forums or other events where knowledge of different actors is integrated.
- Setting up a network of informal contacts.
- Establishing knowledge networks.

- Using technology tools to foster collaboration in innovation management (e.g. wiki, blogs, social networks, web applications).
- Creating communities of practice.
- Collaboration with universities.

38 Managerial Levers

Portfolio management

- External entrepreneurship.
- Acquisition of intellectual property.

- Collaboration with other companies.

Resource allocation	- Internal R&D investment. - Funding of research projects at universities. - Funding ventures. - Recruitment of open innovation staff. - Monetary rewards for innovators.
Organizational culture	- The open innovation principles are disseminated throughout the organization. - Promoting collaborative working. - Staff training on communities and networks issues. - Linking staff from diverse backgrounds. - Establishment of multidisciplinary work teams. - Empathetic and entrepreneurial staff. - Encouraging staff participation in innovation processes.

Project management	- Standardization of processes related to the integration of external technologies in innovation projects. - Development of internal procedures to establish and maintain collaborative research projects. - Standardization of processes related to the intellectual property management. - Development of metrics to evaluate open innovation projects.

Commercialization	- Exploring new and existing markets. - Evaluation of potential products and/or services in collaboration with customers. - Commercialization of intellectual property.

2.3.2. Challenges to foster Open Innovation from Human Resource Management perspective

Generally, the challenges of HRM in open innovation are quite similar to the challenges of open innovation integration process itself. The common problems are: misunderstanding of open innovation; problems with external knowledge search and acquisition; motivation and managing of external sources; the need of development of organizational capabilities inside the company to manage OI process; cultural aspects in all dimensions; Not Invented Here syndrome.

Lenz (2014) made the Master Thesis research on HRM challenges in open innovation. The two dimensions of HRM challenges in OI were identified based on the exploratory research of Brazilian gas company Petrobras. The first direction was connected to the understanding that open innovation exists *in ecosystem network as interdependence of entities and environment that develop through the time and space*. The second direction was connected to the decision to open the boundaries to obtain know-how. These challenges were identified as: (1) improving of interpersonal relationship among the people (e.g. trust, lack of personal confidence, lack of sympathy, different background of familiarities of people), (2) power shift challenge (lack of internal cooperation, lack of respect and appreciation in interdisciplinary projects), (3) making people more valuable to the organization (different interests and priorities about the project, lack of motivation, lack of creativity).

In addition to the challenges the context conditions were mentioned as having influence too: (1) the quality of partnerships, (2) the type of partner, (3) availability of professionals. Some extra intervening conditions were identified like: (1) seeking for new people in the projects because the partner was bankrupted or absorbed by another company, (2) leaving of the OI responsible people inside or outside the company, (3) political decisions.

In the end, Lenz (2014) gives the recommendations to overcome those challenges and mentions the results of implemented solutions as: innovation dynamics, incremental innovations, radical innovation, research, value for created fields (Table 9). However, the same and other challenges have been found by other authors.

External collaboration: Currie and Kerrin (2003), Mueller and Dyerson (1999), Davenport and Prusak (1998) explain why employees do not often use external technologies and engage in collaboration with the external environment due to such reasons as lack of interest and lack of trust. Podmetina et all. (2013) add lack of incentives to this list.

In terms of *organizational practices challenges* Argote and McGrath (1993) distinguish three types of conflicts named conflicts of interest, conflicts of control, and conflicts of stability versus change that need to be solved in the organization to become an open system. Fishcer et al. (2013) combine these conflicts with cultural perceptions, different industries and various organizational background. The results of their research showed that in the richer countries with higher income per capita, organizations tend to focus on employees less than in the countries with growing economics. Though, in fast growing economies, organizations tend to apply more of innovative approaches. Also, organizations pay more attention on employees in the countries with individualistic culture.

Challenges in Knowledge sharing: Caligiuri (2014) agrees with the importance to investigate cultural and country-level differences in implementation of HRM practices. Also, understanding of individual

differences is necessary to let the employees to bring their talents (Volberda et al., 2010). Among “the Big Five” personal characteristics through the time McCrae and Costa (1987) mean (1) extroversion, (2) agreeableness, (3) conscientiousness, (4) emotional stability, and (5) openness or intellect. For knowledge sharing Wang and Noe (2010) relate exchange ideology and evaluation apprehension. It is needed to remember that appropriate HRM practices of performance management and rewards for knowledge sharing, an organizational culture that encourages knowledge sharing, or a work design that encourages team member interdependence would soften

the effect of some individual differences. Boisot’s (1986) model of diverse organizational cultures**,** which by default have different attitudes towards knowledge sharing. Additionally, national cultural perspective can also be contributing to this discussion (Dabrowska and Savitskaya, 2012). The cultural difference challenge is connected mostly with individualistic and collectivistic type of culture. Chow, Deng and Ho (2000) say that this cultural appurtenance influence in knowledge sharing a lot and even if people do this for benefits of organization, they feel bad about it internally. Also, Peltokorpi (2006) warns that knowledge sharing in collectivistic type of culture can deteriorate if there is an individualistic group that is not considered as a part of the collective and language barriers can also be an obstacle. In this way, Zander (2005) advises to pay attention on the HRM practices through the cultural perception of different leadership styles regarding empowering, coaching and supervising. For example, trust and friendship tiers that foster knowledge sharing can be differently perceived in collectivistic and individualistic cultures (Bell and Zaheer, 2007). However, the most effective HR performance was achieved in MNCs by adopting a “culturally-animated universality” with implementing a universal set of HRM practices (Bonache et al., 2012).

Country-level institutional challenges: Begin (1992) and Brewster (2004) remind that every country in the world has its own institutional factors that affect HR systems and knowledge, skills, norms and workers' behaviors. The affecting factors can be connected with labor law, legal system, turnover, unemployment, health system, mandatory education, literacy rates, language skills and so on (Begin, 1992). In this way, the HRM practices of the firm should be constructed in terms of the country-level practices also. This is the most effective way to influence company's performance (Fey, Engström and Björkman, 1999). There is even an idea of standardizing different HR practices to different degrees all around the world (Fey, Pavlovskaya and Tang, 2004).

Other challenges are connected with creativity, innovation and motivation. The research show that control is a main factor of creativity and innovation inhibition (Amabile, 1998; Angle, 1989; Kanter, 1983; Oldham and Cummings, 1996). The reason of that is because control affects intrinsic motivation negatively. Though, in stable organizations control can increase the ability of innovation implementation (Kimberly, 1981). In order to support change and motivate people within diverse groups – for example, scientists and engineers – different approaches need to be adopted (Mortara et al., 2009).

Not Invented Here syndrome is described as a group tendency to believe that the group has a monopoly of knowledge in its field which leads to rejection of other ideas from outsiders (Katz

and Allen, 1982; Cohen and Levonthal, 1990). Mortara et al. (2009) recommends to overcome NIH syndrome by regulative or appreciative methods considering their advantages and disadvantages (Figure 15).

Figure 14. Motivation methods of overcoming NIH syndrome (Mortara et al., 2009)

Generally, the solutions are: involving people in the decision-making process; improving internal communication; setting a good example; establishing adequate reward systems; sometimes targets are not the best approach; make sure the motivational approach matches the people involved – not everyone responds in the same way.

Not Solved Here syndrome (NSH) – an opposite to NIH syndrome "tendency, which result from protective attitudes in firms toward the external exploitation of knowledge" (Lichtenthaler, Ernst, and Hoegl, M., 2010).

The findings of HRM challenges in fostering open innovation have been grouped and presented in the Table 9.

Regulative methods	Appreciative methods
Pros • Performance is measured. Measures must be 'people-proof' and targets difficult, with rewards tied to them	**Pros** • High sense of total accountability that precludes game playing. Large flow of information
Cons • There is no such thing as 'people-proof' measures. People use numbers to cover their back; loss of valid information and unwillingness to take risks	**Cons** • Little control over subordinates; goals are difficult to access; low-growth-need employees will not respond; risk of losing track
Characteristics • Predetermined plan – management seeks to impose it • Management is seen to be focused on goals • Narrow, specialised purpose is emphasised • Management relies on techniques and extrinsic motivation • Development is seen to require more sophisticated techniques and greater rationality	**Characteristics** • Situations are met as they arise. Management is a mutual adjustment between organisation and situation • Management is seen as a process focused on maintaining balance in a field of relationships • General values or norms inform behaviour • The source of control is seen to be within people; intrinsic motivation • Development is seen as a process of increasing understanding of the context, extent and depth of the situation

Table 9. Challenges to foster open innovation from HRM perspective

Challenge Reason Solution Authors

- Understanding that open innovation exists *in ecosystem network;* -The decision to open the boundaries to obtain know-how.	- Lack of trust, personal confidence, sympathy, different background of people - Lack of internal cooperation, lack of respect and appreciation in interdisciplinary projects - Different interests and priorities about the project, lack of motivation, lack of creativity.	**Managers should learn how to improve interpersonal relationships:** - Training trust, confidence, sympathy, communication and motivation; IP rights; - Managing initial informal meetings (use experienced mediators); - Managing workshops throughout the projects (sharing experiences, opinions, ideas). **The mechanisms of balancing power should be developed:** - Defining of the "win-win" strategy (integrate people to decision-making process about the goals and challenges in the working groups); - Managing internal	Lenz (2014)

		discipline to regulate external power; - Shift from managerial power to integration power (importance of "manager" and "leader" roles, installation of mediators from outside, democratize decision-making process); - Responsibilities and positions by matrix type (matrix type for R&D projects); - Avoiding of paternalism and condescendence (requires managers with interdisciplinary skills).	
- External collaboration and engagement with partners	- Lack of interest - Lack of trust - Lack of incentives	- Trust building, motivation program development	Currie and Kerrin (2003), Mueller and Dyerson (1999), Davenport and Prusak (1998);

			Podmetina et all. (2013)
- Organizational practices: - Knowledge sharing	- Three types of conflicts named conflicts of interest, conflicts of control, and conflicts of stability versus change that need to be solved in the organization to become an open system; - Cultural perceptions, different industries and various organizational background. - Organizational cultures - National culture perspective - understanding of individual differences - exchange ideology and evaluation apprehension - individualistic and collectivistic type of culture	- Understanding of three conflicts presence; - To work out cultural differences towards common corporative culture - To pay attention on the HRM practices through the cultural perception of different leadership styles regarding empowering, coaching and supervising.	Argote and McGrath (1993); Fishcer et al. (2013) Dabrowska and Savitskaya, 2012; Caligiuri (2014); Volberda et al., 2010); McCrae and Costa (1987); Wang and Noe (2010); Zander (2005); (Bell and Zaheer,

- Creativity, innovation, motivation - NIH, NSH syndromes	- Control redundancy - Loss of intrinsic motivation - Diverse groups (e.g. scientists and engineers) - Resistance to changes	- Adequate control - Different approaches to different groups need to be adopted - Involving people in the decision-making process; - Improving internal communication; - Setting a good example; - Establishing adequate reward systems; - Sometimes targets are not the best approach; - Make sure the motivational approach matches the people involved – not everyone responds in the same way.	2007); (Bonache et al., 2012). (Amabile, 1998; Angle, 1989; Kanter, 1983; Oldham and Cummings, 1996); (Kimberly, 1981); (Mortara, 2009). (Mortara, 2009). (Katz and Allen, 1982); Cohen and Levinthal, 1990)
- Country-level institutional challenges	- Every country in the world has its own institutional factors that affect HR systems and knowledge, skills, norms and workers' behaviors.	- HRM practices of the firm should be constructed in terms of the country-level practices - An idea of standardizing different HR practices to different degrees all around the world	Begin (1992); Brewster (2004); Fey, Engström and Björkman (1999); Fey, Pavlovskaya and Tang (2004)

- The context conditions / extra challenges	- The quality of partnerships; - The type of partner; - Availability of professionals; - Seeking for new people in the projects because the partner was bankrupted or absorbed by another company; - Leaving of the OI responsible people inside or outside the company; - Political decisions.	The mechanism of making people more valuable should be implemented: - Integration of "the same challenge" people; - Control of project operations (commission on executive and technical levels, implementation of audits, project news letters); - Upgrading of people's capacities inside and outside the company (establishing the communication platforms to share the knowledge); - Nourishing of creativity and appreciating of people achievements (experienced mediators are required, interdisciplinary workshops, appreciating people's achievements, rewarding systems).	Lenz (2014)

2.3.3. Skills and competences required for Open Innovation

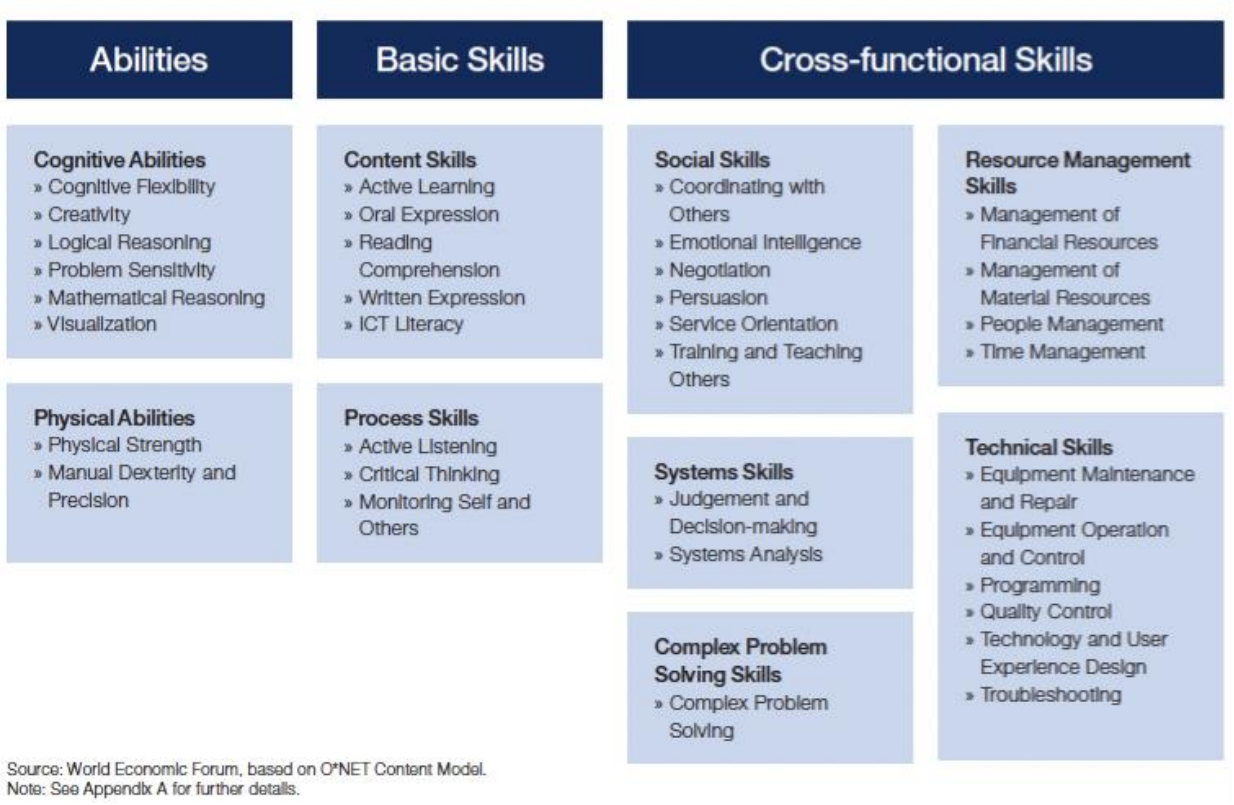
The portrait of open innovation professional

The report of the Future of Jobs (WEF, 2016) collected the core work-related skills that are expected from the employees during the Fourth Industrial Revolution across all industry sectors and job families (Figure 16). Eventually, this will change the portfolio and CVs of new professionals.

Figure 15. Future core-work related skills (WEF, 2016)

In terms of opening the boundaries of the companies and open innovation strategy, the question of who open innovation specialist are and what skills, competences, responsibilities are required for them is becoming a corner stone for the open innovation practice.

There is still a huge gap in terms of job roles for open innovation specialists in the literature. Bianchi et all. (2011) emphasize several individual roles for innovation generation in the company like licensing managers, star scientists (Zucker, Darby, and Brewer, 1998), project leaders (Brown and Eisenhardt, 1995), champions and gatekeepers (Gemunden, Salomo, and Holzle, 2007) but they do not justify these roles with any scientific research.



Source: World Economic Forum, based on O*NET Content Model.
Note: See Appendix A for further details.

However, Dabrowska and Podmetina (2016) made a research of 2014-2016 years. They compared 100 job offers from Internships to the Directors with a tag “open innovation” and got the interesting findings. The results are: 1). The majority of job offers were offered for managers (40%), then for the directors (14%) and for senior (10%). An interesting fact that the job profiles with “open innovation” title increased in four times (from 4 in 2014 to 19 in 2016). 2). The place of Open innovation specialists was identified in following business departments: R&D, Strategic Management, Marketing and Sales, Corporate Communications, IT and Purchasing among different industries. 3). The companies have different view about the meaning of “open innovation”. In terms of this the researches compared the classification of OI activities of Chesbrough and Bogers (2014) and job offers and analyzed which activities are expected to be managed by the OI specialists. 4). The key job roles and responsibilities were analyzed and combined. Along with listed OI activities and responsibilities one of extra task from

Human Resource Management (Talent Management) was mentioned in one job offer of Chemical industry. 5). The common skills for OI professionals were also identified with a new request of entrepreneurial and start-up experience in 2016. According to the obtained research of Dabrowska and Podmetina (2016) a framework of open innovation specialist profile has been done for better visualization and information perception (Table 10).

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Table 10. The framework of open innovation specialist profile according to the results of Dabrowska and Podmetina (2016)

Job Titles

- Open innovation Manager/Project Manager/Director/Leader/C onsultant/Analyst
- Business Development Manager
- Product Manager
- Technology Scout
- New Business Opportunity

  Manager

- Business Strategy Manager
- Technology Innovation

  Manager

- Product Marketing

  Manager

- Event Manager

Business Departments

Industry type

Activities

- Scouting
- Collaborating with

  intermediaries, suppliers and

  customers

- University research programs
- Funding start-up companies in

  one's industry
  • Crowdsourcing
  • Competitions and tournaments

  communities
  • In-licencing IP

  Inside-out

  • Spin-outs
  • Corporate incubators
  • Joint ventures and alliances

  Out-licensing IP and technology

  Coupled

- Strategic alliances, consortia, joint ventures, networks and ecosystems involving complementary partners
- Networks
- Ecosystems
- Joint ventures

Key job roles and responsibilities

• **Scouting** for technologies, solutions, opportunities, ideas, businesses at

universities, star-ups, companies, identify possible candidates;
• **Strategic ecosystems/networks/strategic partnerships:** to develop, manage and influence ecosystem, engage the broader ecosystem, star-ups, potential partners foster external partnerships, build and manage relationships with ecosystem partners, impact and develop high impact

opportunities, manage the network, etc.;
• **Open innovation Strategy:** to create and develop OI strategy, focus on

technology, talent and partners, incorporating an experimental discovery mindset, development new strategies and ideas, resources and technologies from outside;

• **Project Management:** the execution of OI projects, managing technology projects with strategic partners, universities and/or Corporate R&D Tech Leads to develop prototypes, products, manage technology projects that can be transformative to the traditional businesses, manage multiple projects from planning to delivery and execution;

• **Cross-functional management:** to develop and manage technology strategies, work with packaging, process development, manufacturing to identify technology needs, potential solutions, to communicate competitive insights, to interact with customers, account teams, peers, to organize, plan and manage cross-functional initiatives within OI team;

• **OI platforms, crowdsourcing:** crowdsourcing communities, manage OI platforms, design OI activities (prizes, challenges), craft challenges, crowdsourcing, initiatives to collect new ideas from employees;

• **OI events:** manage and coordinate OI events, design and conduct the events with the partners (workshops, students' events), deliver experiences and workshops with start-ups and ecosystem partners;

• **IP management:** develop ownership strategies and implementation plans for technology platforms, structure strategic deals (equity investment, commercial ad/or M&A).

• **Talent Management:** interviews with candidates, trainings, motivate colleagues to drive OI, development of innovative culture, development of competences, competencey0based interviews.

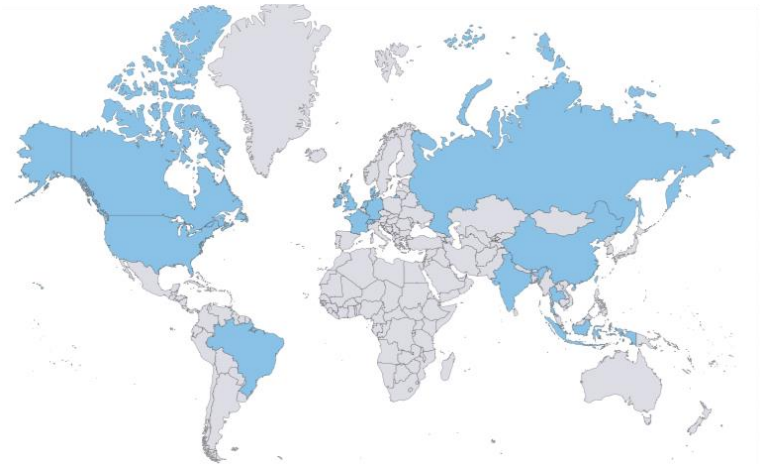
• R&D • Strategic Management • Marketing and Sales • Corporate Communications • IT • Purchasing	• Consumer goods • Consulting • Pharmaceutical • Telecommunications • Electronics • Healthcare • Medical equipment • ICT software • Chemicals • Food processing

Common skills

Outside-in

Interpersonal skills, Team-working, **Communication,** Work independently, Multitasking, **Problem-solving,** Negotiation, Influence, **Project- Management**, Cross-functional teams, **Leadership**, **Strategic Thinking**, Networking, Creativity, Analytical, IP-management, Adaptability, **Entrepreneurial and start-up experience**

Geographical area of OI job posting



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Competences required for open innovation professional

There is a distinction between “competence” and “competency”. Competency is a wider notion and it means “the ability to act of perform” (Woodruffe, 1992; Kurz and Bartam, 2002). However, competence is a specific and definable skill or ability which is necessary for the performance of an activity within a particular business context (HR-XML Consortium, 2007). From the psychological point of view Weinert emphasizes that competence includes abilities to learning, problem solving and a variety of achievements (Weinert, 2001).

Kammergruber et al. note that competences take the central position in open innovation process. Radical innovations require more attention in terms of competence mix (Hafkesbrink, 2010).

The perception of the role of HR is significantly low among the average chiefs and employees. HR is perceived through the prism of service and maintenance mostly of personnel documents in general. Only big and future oriented companies invest in HR development and realize its power. Hoppe et al. (2010) emphasize competence development as a central focus of Human Resource management (Hafkesbrink, 2010).

Podmetina et al. (2014) more than others got ahead in this issue and created Developed Competence Model for OI that is also called as General open innovation Manager Profile based on distinct and

transferable skills and abilities. They grouped required skills in six categories: (1) transformational skills; (2) methodic skills; (3) collaboration skills; (4) exploitative skills; (5) explorative skills; (6) interdisciplinary skills.

Skills and abilities required for open innovation specialists

Skill is an element of competency which is associated by the educational background, the nature of this education and the job experience by the length and nature (Colombo and Grilli, 2005). The skills are developed through training and experience and knowledge transfer (Lauby, 2014). Ability has the meaning "to be able to do something". Thus, the difference would be that ability is more innate whether skill is more acquired (Lauby, 2014).

Open innovation in European Industries report (Podmetina et al., 2016) presents two dimensions of skills and abilities sets required for open innovation specialists: by company size (Large, SMEs and Micro) and by company status (Adopters, Non-adopters, Planners). The results show identical values which means that the differentiation by company size or by company status does not affect

the need of OI skills: 1. Communication; 2. Team work; 3. Networking; 4. Problem-solving; 5. External collaboration; 6. Trust; 7. Internal collaboration; 8. Entrepreneurial mind-set; 9. Negotiating; 10. Leadership; 11. Multitasking; 12. Virtual collaboration; 13. IP-management.

The analogic situation is with the need for abilities – the differentiation by the company size or company status does not affect the list of required abilities: 1. To share knowledge and ideas internally; 2. Creativity; 3. Technology and business mind-set; 4. Adaptability and flexibility; 5. Strategic thinking; 6. To work internal in cross functional teams; 7. To share knowledge and ideas externally; 8. To work in an

interdisciplinary environment; 9. To work with different professional communities; 10. Managing inter-organizational collaboration process; 11. Risk awareness; 12. Project management; 13. Failure tolerance; 14. New media literacy; 15. Cultural awareness.

The successful open innovation Implementation Team (OIIT) usually consists of R&D managers with a strong technical background and business way of thinking. OIIT should deeply understand the processes in the company. Enthusiasm and communication skills are strongly needed because they should help to connect the departments and make the access to tools, skills and resources more easy (Mortara et al., 2009).

It is mostly impossible for one person to have all necessary OI skills. That is why it is important to collect people who will complement each other in open innovation activities. Based on case studies Mortara et al. (2009) describes four categories of OI skills required: *introspective, extrospective, interactive and technical.* Introspective skills are necessary for internal gaps and opportunities. Extrospective skills will help to analyse external capabilities and opportunities and understand other companies' standpoints. Interactive skills or communication skills will bring the value of building relationships with the external world to both internal and external participants. And technical skills consist of the technological, marketing, financial, commercial, management and business skills and tools needed to maintain the previous three (Figure 18).

Introspective – understand ourselves	**Extrospective – understand our partners**
Strategic insights e.g. understand fit with internal strategies **Legal/IP skills** e.g. understand IP implications, ability to draw up contracts	**Behaviour analysis** e.g. analytical, personal. **Strategic insight** e.g. understand fit with partners' strategies.
Interactive	
Communication/collaboration e.g. communicate needs internally and to partners, resolve conflicts, language skills, network building **Negotiation** e.g. understand buying and selling tactics.	
Technical	
Technological e.g. understand principles of technology being exploited. **Portfolio management** **Financial** e.g. understand and set budgets. **Analytical** e.g. evaluation of risk, financial analysis, problem solving	

Figure 16. The open innovation skills set (Mortara et al., 2009)

In addition, the personal desirable attributes are required like strong motivation, the ability to learn (absorptive capacity), sociability, a techno business mind-set, systems thinking, leadership, balance between ego and empathy, an entrepreneurial way of thinking, lateral thinking, vision, adaptability and flexibility (Mortara et al., 2009).

Among the personal characteristics required to improve open innovations inside the company productive capabilities are highly stressed. Productive capabilities can be understood through the possession of general and specific knowledge of how to do things (Richardson, 1972; Teece et al., 1997). For example, for employees it could be the ability to learning and for the employers the ability to hire capable employees. It could be related to internal problem-solving, combination of several skills, improvisation of improvement, ability to solve problems by themselves, understanding the entire process, coordination between each other and response to unexpected situations without asking their supervisors (Carmichael and MacLeod, 1993; Black and Lynch, 2001).

3. Methodology

3.1. Research design

This part presents the research design of the conducted research made in accordance with Saunders et al., (2009).

The methodological approach of the research is qualitative and it was chosen in accordance with the goals of the research to understand open innovation and HR connection following the questions “What? Why? How?” and because there was not any deep analysis of this topic before. Also, as

this issue has not been investigated well before, there was a need to understand the status of the situation about this topic.

The classification of *the research purpose is exploratory* as it aims to understand and find the relation in the combination of HR and open innovation in companies. To achieve this purpose, the literature search and experts' interviews were done.

The analysis process is inductive going from data collection to theory comparison.

3.2. Data collection and the Interviews

Data collection was determined from non-probability self-selection sampling using primary data from conducting semi-structured interviews during September/October, 2016. The target group was open innovation specialists and HR specialists in any type, any size companies practicing open innovation. Hence, the in-depth interview guide with open questions was developed (Appendix I). It consists of six groups of questions: general, concept of open innovation, managing open innovation, open innovation specialists, culture and HR to foster open innovation. The promotion of the research was realized through the existing University's database from previous open innovation research (around 70 contacts) by e-mail, LinkedIn search by key words "open innovation" and "HR" (sent around 700 requests) and posting in appropriate groups in LinkedIn - "Open innovation Community", "HR Innovation Group", "Open innovation and Collective Intelligence", "Open innovation Network" and Facebook groups - "Open innovation Strategy and Policy", "Open innovation", "Open innovation in SMEs", "Teaching and coaching innovation".

Eight specialists from seven companies (out of more 700 requests) replied being interested interviewed; 2 – from the project database; 2 - through LinkedIn search; 2 were found by snowballing technique from previous interviews; 2 – from personal networking. The refusal reasons were mainly "holiday leave", "lack of time or tough schedule", "security reasons", but mostly no reply at all.

The held interviews are semi-structured and in-depth, as the interviewees have different background and could concentrate more on some questions whether on the others. The interviews were held by Skype approximately for 60 minutes each, recorded with allowance of the interviewees, transcribed and further analyzed. The interpretive technique is observer's impression in a structured form.

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The main goal to conduct the interviews was to interview people connected with open innovation and HR areas – knowing about open innovation and practicing or planning to practice it in the organizations, and open innovation and HR specialists per se in the companies with open innovation approach. Table 11 presents the interviewees' general data: country, industry type and size, job role and background.

Table 11. General description of the interviewed specialists

Interviewee No	**Country**	**Industry**	**Size of the company**	**Job title**	**Background of the interviewee**
Interviewee 1	Denmark	Finance	Large	Management Consultant	Innovation management, MBA, management consultant
Interviewee 2	Denmark	Pharmaceutical	Large	Head of Innovation in R&D	Scientist, >10 years in pharm industry
Interviewee 3	Netherlands	System supplier for high-tech industry	Large	Open Innovation specialist	Product innovation, business management,

				(Independent)	strategic management, start up, change management
Interviewee 4	Switzerland	Insurance	Large	Open Innovation Manager	Non-governmental organizations (NGOs), start-up
Interviewee 5	Netherlands	System supplier for high-tech industry	Large	HR Business Partner	Research 18 years in HR
Interviewee 6	Spain	Consultancy in HR and Innovation	Micro, working with SMEs and Large	HR Innovation Consultant	Phycologist in HR, HR in multinational companies and SMEs, HR Director, start up
Interviewee 7	France	Industrial/ gas	Large	Innovation specialist in R&D	Engineering in R&D, management, communication marketing
Interviewee 8	Italy	Household and professional appliances	Large	Director of Open Innovation	R&D

After the interviews were conducted, recorded and transcribed, the process of data analysis started. The appropriate answers to the interview

guide questions were grouped in the excel document to be compared between each other. In the defined logic the results and findings are presented in the next chapter.

4. Results and Findings

This chapter provides the main findings and results from the conducted interviews in a structured way according to the interview guide six groups of questions. The questions were constructed in deductive way, going from general to research specific information. The results have been grouped and presented in the following way: 1). The concept of open innovation; 2). Managing open innovation; 3). Implementation of open innovation; 4). HRM in OI process; 6). OI as a job role.

4.1. The Concept of Open Innovation

The provided definitions of the OI concept brought the view of company differentiation and also looking outside the company for searching the innovation or appropriate partners to create it together. The understanding of open innovation brought the following definitions:

"Firstly means - *focuses own efforts on innovation at which a company can differentiate itself from its competitors and secondly means - 'buy' innovation from external parties in areas where these parties excel in their competitive market*". Interviewee 3.

"*Innovation projects which are new and are not alone made within the company but taken externals which means customers, or other corporates, (-), universities, experts in the fields, and so on, and as well start-ups within the project and working with them*". Interviewee 4.

"*Business model, co-development with customers and co-development within the region*". Interviewee 5.

"A new business model, a new way to interact and work with each other". Interviewee 8.

"*External inputs, taking knowledge and mind-set, new ideas from outside*". Interviewee 7.

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However, one interviewee saw the open innovation activity in the annual report though the company was not actually practicing it at all.

The sources of hearing about open innovation concept by the first time were categorized on four groups: 1). From current company; 2). From previous company; 3). From university; 4). My own research. The results are presented on Figure 19. Thus, the majority of the interviewees learnt about OI at the current job place e.g. form colleagues or company emails.

From the job task, commented like:
"*...when we started to work on this I did not even know that concept existed...so, we wanted to solve the problem...and it was more in how could we easily interact with companies by ourselves to make the process faster. We did not know that it was called open innovation".* Interviewee 2.

The equal amount was shared between *the previous company* and *the university*: "*From working in another multinational company 15 years ago".* Interviewee 3.

"We had a class which was about open innovation". Interviewee 4.
Finally, only one person knew about OI by the own research*: "From the articles".* Interviewee 5.

Source of knowledge about Open innovation (%)

12,5

25

25

37,5

From current company From previous company From University My own research

0 5 10 15 20 25 30 35 40

Figure 17. Source of knowledge about open innovation

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The interviewees gave two different perspectives on OI level of adoption. The interviewees separated the level of open innovation adoption in one part of the company from the entire company:

"We have established OI very well in one part - in the research of organization but it is not reprehensive for the entire company". Interviewee 2.

"OI is established very well in R&D but is not reprehensive for the entire company". Interviewee 3.

"We are experienced adopters in R&D. The other part of company is at the early stage". Interviewee 7.

Wherein, one of these companies also has OI as their core business. One company was mentioned as *experienced adopter*, one company is at the *early stage of adoption,* one company could not formulate it.

The main activities and processes of open innovation were mentioned: spin-offs, partners/customers/university collaborations, crowdsourcing through open innovation platforms, *"open up research process and exposing it to anyone on the website",* innovation outsourcing, screening and starting start-ups, partnerships in co-working, corporative co-working, rotating the employees within the same region, making conferences for external talents in R&D. The result shows that

companies mostly practice inbound and coupled OI activities (Figure 20).

Figure 18. Companies' open innovation main activities

OI activities	Interviewees						
	1	2	3 and 5	4	6	7	8
Inbound OI:							
Scouting				✓		✓	
Spin-off	✓						
University research programs	✓						
Collaborating with customers/suppliers	✓		✓		✓	✓	✓
Crowdsoursing		✓					
Funding start-ups				✓		✓	
Competition and tournament communities				✓		✓	
Outbound:							
Corporate incubators			✓		✓		
Coupled:							
Ecosystems and platforms		✓				✓	✓
Strategic Alliances			✓	✓			
Networks		✓	✓	✓	✓		✓

The question about the future of OI caused lots of discussion. The interviewees have predicted that open innovation will be the natural way of innovation process and will not exist separately like nowadays:

"First of all, I do not think we will have OI departments in 10 (or in 20) years because OI as a concept "a word" will be dead. We will use innovation in open matter... And «OI specialist» is not going to be the name – it will be a specialist on some product name or specialist in something else, where you can add OI. So, today we need to emphasize OI because it is different from traditional closed innovation. Therefore, to change we need to be clear on that but once that change has been implemented, the importance of open is going be other question. And you are going to realise: if you are a company and you want to remain competitive and come up with new things where you can take money from, they are going need to have more fast, flexible and transparent innovation process. Otherwise, they will not be able to compete with other companies. So, in order to be competitive you need to be open and

this openness is going to be self-explained pretty much – this is going to be innovation itself". Interviewee 2.

"Hopefully, OI specialism will by that time be embedded in job profiles of all relevant functions (which means practically all functions) in the company. In other words: no OI specialist needed. So, I think every function in an organisation will learn how to deal with open innovation and it will become part of a normal job profile and at some point you will not have any experts for that reason. And this way will be a new level of market, new level of industry. Like people will all of this mind-set and they will just deal with this as something usual, something simple. But I think it will be at least in 20 years". Interviewee 3.

"Yes, new generation shares everything even privacy, the world will become very open. They want to share things. And there is no way back". Interviewee 5.

4.2. Managing Open Innovation

In general, the entire strategy of open innovation was found only at one company with full description, reasons of need, deployment, vision, mission and three main pillars of network, challenges and mindset. In several companies the OI strategy exists in R&D. The statement for that is:

"I would never say that OI is a goal – it is just a tool to reach something else. So, saying that we need to have OI strategy in the company – yes, but only as a matter of the need". Intervewee 2.

However, one company considers open innovation as their core business which is integrated in their general strategy and they also have separate HR strategy. One interviewee confessed:

"I have not seen it in a structured way but the companies really want it".

Interviewee 1.

However, among the existing OI strategies, its' main goals were mentioned: *"leveraging external competences".* Interviewee 2. *"Lowering barriers for external companies to come work with us" (Interviewee 3). "To become most innovative company in our industry".* Interviewee 4.

At the same time, HR responsibilities in OI strategy were defined as: a supportive role to the main OI process; appropriate recruiting; competence management and redesigning HR tools (e.g. making them more visible).

At the same time, the measurements of open innovation were determined through the criteria depending on particular areas where the process is going: the project portfolio or business case, how profitable is it compare with other similar projects, the amount of OI engagements, interactions and follow ups, the quality of those interactions, the number of successful products, profit and loss, individual Key Performance Indicators (KPIs) like citations in media and academic articles, the number of screened start-ups, the difference between the amount of discussions about the possible collaborations and the fact of collaborating, the amount of generated ideas.

Despite of open innovation promotion activities, most of the interviewees confessed that people are still not aware of open innovation vastly or they are mostly aware in the place where open innovation process is centered, e.g. in R&D, in Transformation and Market Management Department, etc. However, as further from the core place innovation location as more people confused about it:

"They know about us; they do not quite get it yet. We are still working on it".

Interviewee 4.
"They heard the name. They know but not involved directly in it".
Interviewee 7.

Though, some are not aware of the novelty of process per se, some - how the process what they are doing is called:

"I think even in the company I work now people are involved in open innovation every day without knowing it is called open innovation".
Interviewee 3.

In its turn, the awareness of knowing the name of process which we call *open innovation* was understated. Thus, one interviewee mentioned:

"I think the most important thing is to understand how open innovation works, not necessarily to know that it has a title which is «open innovation»". Interviewee 3.

Among the departments involved in OI process, the interviewees mentioned: R&D, HR, Finance, Sales, Procurement and Marketing. Though, this involvement is not uniform and every company named different departments with more or less connection. One company explained the need for this cooperation:

"We try to work very close with other departments because we could not to do it alone, like there is still so many internal processes where it helps if they are on- board, involved and motivated". Interviewee 4.

The necessity of internal and external promotion was aptly noticed by one of the interviewees:

"I realized that it is very important to make OI work in reality you need to have good external communication but you also need to have good internal communication. So if you are really good to make this commitment outside – it is going to stop at you if you have not done

internal process well – internal awareness". Another interviewee mentioned: *"We do need to promote it because we are doing it for our customers. As we need to be open between our companies we need to promote it".* Interviewee 2.

Companies that are concerning about open innovation promotion use such external activities as social media promotion, e.g. LinkedIn and Twitter posting and following interesting people to create networks. Most of the companies emphasized the importance of participating in conversations with customers to explain the business model of open innovation process. One company has *Scientific challenger* event where they invite different start-ups from outside and their investment team decides who to cooperate with and which ideas can be developed together.

Internal activities include training and coaching mostly. Or using other people like *innovation ambassadors* to promote in other departments. Among the communication channels *Google+* platform, personal blog to promote entrepreneurship, internet community, intranet, news letters were mentioned.

One company has a program of *OI Ambassadors Journey.* With the simple e-mail, explaining the main idea of OI and the program, they are searching for such volunteers ready to teach and promote this concept.

Another company creates big events related to open innovation promotion with different context. For example, entrepreneurship and intrapreneurship, mobility, etc. They always have the board of the directors on the stage to emphasize the importance of this. Also, they make such small events like *idea duel* or promo-actions e.g. giving ice-cream to people in the shape of company symbol:

"We are telling about innovation, open innovation, how we do things and if someone else wants to join us". Interviewee 4.

Another example is *attracting Master Thesis students and being interested about their ideas*. Interviewee 1.

4.3. Implementation of Open Innovation

Positive and negative aspects of OI implementation have been mentioned. In regard the *positive* sides were exemplified: *new business model of transformation,* less bureaucracy, less time of process making, new opportunities, differentiation from the customers, employees' feeling of being proud and awake, flexibility, new services, e.g. easier process of payment, better way of working, more transparency, win-win communication, more external partnerships, innovations in different areas of the company, e.g. safety, logistics.

From the *negative* side: distortion of traditional internal processes; negative human reactions on many levels: employees' feeling of losing control and importance, employees' insecurity and feeling fear to lose their jobs. One Interviewee reproduced the employees' phrases:

"Wow I just talk about my ideas. It could be stolen. Do we still have a job in 10 years?". Interviewee 4.

Other negative sides: complexity, risk of innovation failures, lack of experience to manage those failures, employees' struggle with managing new kind of relationships, risk and fear of dishonest relationships, *internal hating* because of misunderstanding where the money is spent, demotivation.

It was observed that the amount of positive and negative aspects of OI implementation has approximately the same number. However, the positive outcomes have been mentioned slightly more that the negative ones (Table 12).

Table 12. Positive and negative aspects of open innovation implementation

Positive and negative aspects	Interviewees							
	1	2	3	4	5	6	7	8

Positive:

"New business model of transformation" +
Less bureaucracy +
Less time of process making + + New opportunities +

Differentiation from the competitors + + Employees' feeling of being proud and
awake +

Flexibility + New services + + Better way of working
More transparency

Win-win communication

More external partnerships Innovations in different areas of the company

Negative:

Distortion of traditional internal processes
Employees' insecurity and feeling fear to lose their job

Negative human reactions on many levels Employees' struggle with managing new kind of relationships

Complexity
Risk of innovation failures
Lack of experience to manage the failures Risk and fear of dishonest relationships Misunderstanding
Demotivation

At the same time, internal and external barriers of OI implementation were revealed. The internal barriers were mentioned more than external ones. The internal barriers were found in such aspects as:

1. Investment and risk in investment:
"Investment and risk in investment and these two follows each other unfortunately. But you have this sense: why should I do it personally? What is my gain of this? What is my benefit? It should be something that all the company sees that... So, even the top-management knows the innovation is important, but the problems are more on the execution level, and the investment and the risk, and the politics can get into the way. And some companies even have problems on

looking on the innovation as a structured process. Many companies think that innovations are same as the ideas". Interviewee 1.

2. *Systematic view and lack of top-management support:*

   "If you want to have OI process again, there should be a need... And there are usually so many different areas and departments involved in it... So, you need to make a big change in one department and then you have to accept the change from big perspective. That is why it is very important to have top management endorsement, that what we do is something that we need to do, otherwise it would not happen". Interviewee 2.

3. *Lack of experience and understanding of OI cooperation in terms of roles and responsibilities was mentioned as a big barrier:*

   "Another thing is the middle managers' problem. Middle management that is between employees and top management usually needs to be sure that they deliver what they need to deliver within finance and budgets... So, it is really hard for middle manager when someone else is trying to implement open innovation. And they say: "we do not do it this way – we do it this way. And that how it is always has been done" ...but if you look further way – you need to have that change in order something else will happen in someone else's department and this is again very

hard to let people realize why they need change. Because they are usually responsible for their areas". Interviewee 2.

Another type of this problem was described as internal competitiveness between the departments:

"They started the relationship (the development of the project) without good contracts about risk and reward. And they were very, at some point, unpleasantly surprised by the claims they got from customers. And it is not because customers had a bad intent, it is just because at the outset they did not agree clearly on roles and responsibilities". Interviewee 3.

"We are competitors between our own departments, though we are open to the outside world". Interviewee 5.

Another problem of the same category is connected with job rotation:

"Managers do not want to let their employees work in other departments for some period. And this is not so open". Interviewee 5.

4. But the most common reason was people's resistance, unavailability, thinking of knowing internal problems and fear based on not understanding of why this process is needed. This problem in sum was identified at all levels in the companies including employees, middle- managers, experts in IP and top-management in majority of the interviewed companies. This was already mentioned in the chapter 8.2. under "negative aspects of open innovation implementation".

Another perspective on this question was given from the consultancy agency, which gets the requests of changing the organizational culture within the organizations:

"When you touch the culture of the company you need to be very careful as sometimes companies are not ready for those changes. Sometimes it is better not to do anything. Culture is an organizational behaviour. When you start to make changes and they say "do not continue, stop" - we need to adapt... Companies are not machines, they are ecosystems, that is why change is so difficult. Sometimes, top-management disturbs the innovative process. The implementation process is very hard because people are afraid of these "weird" things. Also, companies think that they know their problems, but we always need to research before, understand the problem, understand the employees. In fact, they want we meet in the room and think about the solution. But this is not an innovation. Innovation is a process very similar to science process. You have hypothesis and then you have to prove. They say they have all the information but then they send a slide in Power Point. They do not study and research about the trends - they care about the action. In fact, the barriers are in every level - testing, prototyping, implementing, etc." Interviewee 6.

From the external barriers were mentioned following: 1. External promotion:

"You really need to promote your work. And recently I came to the conclusion that we need scientific promotion. Not business and marketing promotion, but how to promote science work in order to attract science side. You need to promote it...and this is hard because it is different kind of work". Interviewee 2.

2. Partners' conviction or managing the OI process with them:

"It is crucial for the cooperation to agree about that (the cooperation process) in a very early stage. In general, communicating the proposition...is a challenge, because it is so new, and it is an easy message on the surface, but it has a lot of details to it which make it complex to communicate it in a clear way. So that is something that requires special attention... if you go back...you had what I call, sort of, old fashioned purchasing people, who only looked at cost and they were

bargaining very hard to get the costs down and etc. That is not a way you can manage complex relationships like the ones you need in open innovation. You need to have a much more mature way of managing relationships". Interviewee 3.

3. Finding the right people with the right skills:

"Another problem – you need to find people who have interdisciplinary skills or even transdisciplinary skills. Because we usually base company on the specialists like researchers, marketers, lawyers, etc. To make this happen – you need to have broad understanding of all those things. And this is something that is hard when you want to implement open innovation on a practical level". Interviewee 3.

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The recommendations to overcome mentioned barriers are also connected with the problem origin:

1. The problem of internal culture change should be solved by competence management:

   "The competences that you need to do all this should be built around your people which doing this. This is the correlation between OI, HR and Strategy alignment. build these competitive recourses and HR department guys are really those who should help with this. And HR should build practices around it as it is a part of the business processes. They should help us establish this area: hiring the right people, especially OI managers. Sometimes HR is only about pay rolls instead of developing people. But strategic HR should really help and build the practices around OI. Maybe OI manager should take care about the business processes and depending from the business model he has to be responsible for OI area. But the practices have to be in place and HR should drive them". Interviewee 1.

Also, by building clear and explanatory communication with the concreate goals:

"And when you talk about OI initially, it sounds very fluffy and it can sound very abstract and it can sound really weird to some people. Though if you cannot communicate excitedly of what you want to do – it becomes abstract. And then people do not understand it and then they can get scared. So, I would recommend to act more specific in what you want to achieve and how you are going to do it. Then people see it more clearly and they will not be so scared about it. And also by explaining "this will be good for you from this perspective". So, again if you can communicate how it can benefit their deliverables and their carrier and performance, they will also be much more interested then just seeing something that is going to be their task". Interviewee 2.

Another interviewee also mentioned the importance of open and clear dialogue:

"I would probably say just be very open. Just talk to people and explain them their advantage like properly. Like this is good for you, because of this and this and that, and not only talk to them but give them an instrument so they can see that it is beneficial for them. Take them into a project into a project as early as possible so their ('not invented here') factor is not becoming that huge. And take them serious, take their concerns serious... We have to do it". Interviewee 4.

2. The problem of external promotion can be solved by *"attending conferences, writing papers and so on".* Interviewee 2.
3. For the problem of external communication, the recommendation would be open discussion on the early stage of the project:

"Take initiative in developing recommended ways of working (ref my book) and start open discussions about them. Example: with new customers we start risk-reward discussion almost from day 1; we explain challenges of risky development project and propose ways to deal with them in a win-win fashion. Yes, initially some of our customers realised that, where we came to the conclusion that we need program managers or alliance managers instead of sales people, some of our customers came to the conclusion that they need similar type of people instead of purchasers". Interviewee 3.

Also, one of the companies uses creative methods and thinking "out of the box" in terms of attracting the partners/customers to show the advantages of their collaboration. For example, by using innovations*:*

"We try to involve them as early as possible. Then usually they do not like us but then we try to give them, to show them to advantages. For example, we had a huge success with one project called Crash Test...And we were filming with the 360 degrees' camera, a crash inside, outside, with the drone, everything. And then we made a movie out of it and we can put on virtual reality glasses and be live within a crash. Like crashing in another car. They really loved it because customers loved it. They can put the glasses on the eyes of the customers and they can experience a crash ad they have something to talk about which is not insurance related and boring. But is good for prevention because insurance is usually very keen on prevention. So this is something we really got them on our side. We are doing a lot of more of this kind of things now to just give them an instrument to make their life easier. But also to get them on our side". Interviewee 4.

From the consultancy perspective towards the partners' unavailability:

"Explaining, convincing them. We have to change the process a little bit - to adapt it. Because organizations are not ready for radical things (maybe 2-3 years will be enough). It depends". Interviewee 6.

4.4. Human Resource Management in Open Innovation process

The questions in this sector were made to analyze which type of organizational culture companies have and whether this culture is appropriate for practicing open innovation. As the interviewee from HR consultancy marked:

"Innovation is a part of culture. When you want to innovate just in the process - you touch the culture". Interviewee 6.

As interviewees mentioned the main obstacle in changing innovation strategy is just the way of old habit, which is natural for all people. Although, it can be changed by educating, coaching, training and managing.

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In general, people are more open in sharing the ideas in the development organizations and less in manufacturing. Two interviewees approved this finding:

"More on development, less on manufacturing side. There is even competition within the company departments more than with our competitors". Interviewee 5.

There are no formal policies for that, and it stays in informal way only. One of the company uses Google+ collaborative platform. But sharing is mostly concentrated inside the company:

"Internally people are encouraged to share the ideas. We encourage to take part in conferences. But they do not share to much externally". Interviewee 7.

As was mentioned by one company, people's attitude towards external ideas and technologies is good only when they understand it. Thus, the best way to convince people is still "face-to-face" method.

Concerning about the attitudes towards the failures and risk-taking all the interviewed organizations perceive failures quite forgiving, as

lessons and opportunities to learn. Though, there is a difference between the failure in manufacturing and in development:

"*We learn from it. This is different between development or manufacturing parts. On manufacturing it is stricter. But this is what we are trying to change in the culture - learn by failure. But it is slowly changing during the last year".* Interviewee 3.

However, one organization finds hard to accept the failures:
"It is still difficult to accept the failures. It is not in our culture yet". Interviewee 7.

In the purpose of entrepreneurship support, one of the organizations makes their own event annually in the style of Fuckup Nights (fuckupnights.com, 2016) – the international event of entrepreneurs' stories of failures.

Risk-taking encouragement has quite the same nature in terms of its existing mostly on the development side then on the manufacturing:

"In development pretty open, certainly in terms of policy, sometimes less on individual engineer level. So, it is fine to take risks if you know them upfront, because then you can discuss them with your customer and you can agree on a risk reward. But if you do not discuss them upfront then it becomes very nasty quickly. Because one of the two parties start to spend a lot of money or even lose money, and that is not good for the relationship, for either partner". Interviewee 3.

Or as another company noted:
"We are promoting risk-taking but only if it can succeed [laugh]". Interviewee 7.

Otherwise around, the only company find risk-taking promotion strongly:

"Yes, risk-taking - that is the main basic concept of everything". Interviewee 4.

The question about the rewarding system for OI activities is still under discussion in the companies, but majority of them consider non-monetary reward for OI process more appropriate, also shifting from individual KPI towards company's (team) KPI.

The example of non-monetary rewards practiced by one company:

"...giving the employee at least 20% of his or her time to do this project (the project, they would like to try) because it is very important. People are incredibly motivated on because they can love what they are doing". Interviewee 4.

At the same time, the same company has one of the monetary reward ideas:

"We were thinking about that very deeply and we do not have budget to monetarize it. It would be amazing to have a reward because, for example, if you bring a new employee to the company, like if you tell the HR "oh for this position I have a person" and this person gets employed and this person survives the trial period, you get a reward". Interviewee 4.

Another company has monetary rewarding mechanism led by procurement, not by HR. They reward for the patents.

It should be noted that most of the interviewees consider HR as not involved in OI process and taking care of traditional administrative functions and documentation. Surprisingly, one company, regardless having OI strategy with *mindset* goal as one of the pillars for OI implementation and *"orientation on people, who have to learn to interact with each other in a new way" (Interviewee 8)* does not see how HR can be helpful in this process except recruiting function.

However, some of the companies have already realized the idea to attract HR to help to foster OI in the company:

"Yes, we have an HR department that usually deals with employment, hiring and firing people and they not big one but they do exist but they do not play role in the current OI platform. However, I just talked to some from them and I realized that I would like to educate some of those people. So we started the discussion how can we start an education program for OI ambassadors within the company. So we can add skills and instead of

hiring people to work only in OI we can identify people that are able to that beforehand and educate them to use OI tool in their work". Interviewee 2.

"I am working intensively with HR to create this new function and to implement in a good way in the organization. But they are not actively involved in..." Interviewee 3.

However, the ideas of how HR can be helpful in OI process were articulated by the interviewees:

1. Identifying and hiring OI specialists according to needed competences:

   "HR build these competitive recourses. And HR should build practices around it as it is a part of the business processes. They should help us establish this area: hiring the right people, especially OI managers. Sometimes HR is only about pay rolls instead of developing people. But strategic HR should really help and build the practices around OI". Interviewee 1.

   "I would not say that the company need to change all the employees but they need to find a few that will say "oh yes!". This is too hard to change people if they do not have an idea, but the

ones that do say "yes" or "maybe" – focus on those. And those we can train and recruit and so on and those people are usually motivated because they have curios nature and they usually educate themselves and they see things little bit further than just their own perspective". Interviewee 2.

"But also something that we are starting to do now is to (in a very structured way) to look at the external market for open innovation and to think about what kind of competencies we believe will be needed in the next few years, and then to develop a long term plan to acquire those or to develop those competencies. So, managing that whole planning process during the year is also something where HR is playing an important role or will play an important role". Interviewee 3.

"Now we are making a research of which competences our customers want and making the profiles of each employee what competences they have. So, we are making it more visible in tools now". Interviewee 5.

2. Making the traditional HR processes more creative and innovative:

"HR is boring and by employing boring people, the innovation does not have a chance. It should be very-very open. Nowadays in our company, if they are searching for new employees, they want to make the job descriptions a lot more innovative, more fun. They are making the job descriptions more innovative. They are posting it on social media as well...About training - not just doing a boring presentation but like get the meaning and the emotions over...And I want them to recruit people with an entrepreneurial background. It is amazing for the company but those entrepreneurial people get those training and get inspired by the HR". Interviewee 4.

"Empowering employees. Redesigning HR processes (e.g. appraisal performance process, onboarding process). We have created first corporative co-working in Spain. Innovative process is a design process and we use design technics with drawing, painting and using the right part of the brain". Interviewee 6.

3. Training and coaching, creating OI culture.
Despite all of the interviewees mentioned the importance of training people in the organization, none of the organizations is currently practicing it, excluding HR consultancy working on it.

Eventually, the main roles HR can lead to overcome the OI implementation barriers were given to appropriate recruiting, educating, coaching hard and soft skills and motivating people:

"I guess identifying people within the company, running education programs to create these OI ambassadors and also motivate people. For instance, go around and identify people who we can pick to bring them to the next level and by doing that you can also make all the things kind of special and say "wow, I was picked up by HR!" and they can become a team and OI become more rewarded and special, unique. And then you can educate them in interdisciplinary understanding and new business models in the way how can we reach out in different ways and to be more inside driven people. So in this way HR also can help to change the role how we can think about innovation and R&D, so it gets more inside driven". Interviewee 2.

"Training, coaching of the hard skills. And at least as important at a soft skill level: promote open attitudes, cooperation with other organizations/cultures. In my mind the soft skills are at least and maybe even more important than the hard skills. Also, because the hard skills are easier to train, to coach". Interviewee 3.

Also, the interviewees find the role of HR important in the process of open innovation:

"Very important, because OI is mostly about competence management. My point there is that the what the supplier sells to its customers is mostly the competence of its' people... So, they want to develop a product, or a machine, a system and they need competencies for that and some of the competencies they have inside their own company, and the other competencies they look at suppliers. For that reason, HR is critical in order to make open innovation successful". Interviewee 3.

The interviewees stress the role of HR will become more important and strategic oriented. The e- tools will replace traditional administrative HR functions and HR will be transformed in *designing work experience* with individualistic approach:

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"I think that HR is going to have much more important and hopefully active role in normal operations, because when we talk about specialists today, not only about OI, but specialists in the research area, a company cannot be leading in all technical possibilities. You cannot be expert in this and then the expert in that and then the expert in something else at the same time. There is always is going to be someone else that is more expert in that...And that means, that HR will have a role how to identify those skills and how get them on the board. I think in 10 years we will probably see less traditional permanent positions in early research and we will see more on the fly specialists consulting work. It is a kind of bringing the specialists when you need them and pay for specific skills...as this is going to be for a specific problem for a month, for a week or even for specific task that takes several seconds. And HR probably will have a role how to set this, because we are not going to have too much of those traditional employment contracts. So, the first work is to set up the contract framework, to use the skills outside in a more flexible manner. And the other role is the internal permanent – I guess you can call them OI specialists...Basically, they will need to understand what we are going to solve internally in order to get a

product and then how can I communicate that into a concrete problem that I can ask someone else to solve externally". Interviewee 2.

"HR will have more sophisticated ways of managing competence roadmaps in line with market needs". Interviewee 3.

"The new generation Z is coming, and they have different vision, carrying less about money but more interesting job. They need other labour conditions. They do not like hierarchical position; they are more networking. Now, I am doing research and thinking what to change to be ready for that War of Talents. But maybe there is no HR role at all. Decentralisation. There will be a lot of e-learning and e-tools. The main issue would be still find right people. But it is also very good to have someone in the company who will care about health culture of the people. I do not believe that it will totally disappear. And I do not think the global changes will happen in 10 years. But the least interesting things will disappear like administration role. It will be more strategic HR, more HR partners. So, it will be more managerial level". Interviewee 5.

"From the recent report of HR future I read – HR managers have to become designers of employee experience. We have to develop policies for everyone. Because everyone wants different things, then you need to develop specific things for people. Employees go to work to have experience. We are the knowledge professionals. The responsibility of HR is to design employee experience and to give them passion and work satisfaction. Individual approach". Interviewee 6.

4.5. Open Innovation as a job role

All interviewed specialists are from European countries work in different industry areas of different sizes. The job roles vary from independent professionals to top management level which

are connected with open innovation directly and indirectly. Their backgrounds are also differentiated in width and depth and presented by knowledge in management, research, marketing, entrepreneurship and other professional areas.

According to the interviewees with the job role "open innovation specialist/manager/head", those roles appeared due to the top-management request, customers' requirements or because of "being taken over" from a competitor.

The job tasks are diverse and described as: *management consultation, establishing and implementing open innovation strategy in R&D, shifting from manufacturing to development of product life cycle, screening and starting start-ups within the company and company transformation, recruiting, educating, competence management, job rotation, open innovation promotion, innovating in HR.*

One interviewee noted before the interview about the topic of the research:

"It is something that has not been investigated too much but it is going to happen. So, the most things we can discuss are the things that I can predict but not the things we have actually done". Interviewee 2. That is giving a clear picture of interviewees' professionalism and interest.

The first question was about the difference between «innovation manager» and «open innovation manager». The interviewees found this difference mostly in the understanding of the definition of open innovation. As it is more external process, whereas simple innovation can be realized internally only:

"Innovation manager can be internally focused, mostly looking at technology and competence roadmaps. OI manager will, on top of that, be externally focused, execute market scans, make SWOT analyses per innovation competence area and facilitate make/buy decisions for innovation. So an innovation manager is more generic role, I would say,

of someone who manages innovation but can still be internally focused assuming, that everything needs to be invented inside one's own company. Whereas an open innovation manager, by definition, I would say, should almost start to look outside the company before deciding to invent something inside the company". Interviewee 3.

Additionally, the difference for HR working in OI company in compare working in a simple company was significant in the aspect of networking mostly:

"That is difficult...I guess I am more in contact with other companies in compare with previous company. So, I have to network now and understand how other companies do their things, what is their strategy or competence management. We have the HR group meetings with other companies and we discuss labor condition or how to do some practices". Interviewee 5.

The opinion about who should be responsible for managing innovation is quite explicit and depends a lot how the concept appeared in the organization. For example, one company in one company it was the request from the top-management, which started to be located in R&D. Hence, the Head of R&D is in charge for OI process in the company. To manage this process more effectively *the ambassadors* were chosen – people from different departments helping to promote OI within their divisions. This is also looks like indirect OI team.

More global perspective was found in another organization that put OI responsibility on a team in *Department of Transformation and Market Management.* The team even has its own brand and located directly under the board of directors which makes the process faster and more agile.

Another company has placed the responsibility of OI in the *Development and Sales department* as open innovation process is located there. They

found that the usual role of sales person was not appropriate for managing OI because *"the average salesperson finds it difficult to manage these types of complex relations" (Interviewee 3).* So, they developed a new job role within the department – *Group Product Manager*, who is responsible for *"managing alliance between the manufacturer, the developer and the supplier*". Interviewee 3.

Obviously, that in a micro company the founder is responsible for managing OI. Though, other companies have practices on finding less formalized structure in managing OI, e.g. *"everyone is concerning to be open and find the ideas*". Interviewee 7. Another case, when OI was initiated and pushing by a Master Student and became a *grasp initiative* that lead to a spin-off eventually.

The new job titles and job roles were found for OI specialists like Group Project Manager - for managing complex relationship of OI process with the partners, and voluntaries OI ambassador – for OI promotion, OI broker – for connection with innovators.

Despite of OI presence in the companies, not all of them have OI specialists or aware about them. For example, the two interviewees from the same company gave opposite opinion about that. Thus, one interviewee named two recent OI specialists, while the HR specialist did not differentiate that by meaning:

"We do not have OI specialists per se as everyone is involved in OI process". Interviewee 5.

Nevertheless, in the companies where such job roles already exist, the job tasks of such specialists were mentioned:

"There should be someone who taking care of running open innovation projects as they should be measured and completed in a different way. I

see OI manager as a preamble, leading and defining HR manager role and also establishing the practices in the area". Interviewee 1.

"My task is, first of all, to establish a strategy and then implement it. We do not have people fully committed to open innovation work, because that does not make any sense as you are here not to implement open innovation, you are here due to do something else by using the tool of OI. So, we created these OI ambassadors because they understand it and they can help to create mass in the company to actually implement the change. But they need to be anchored in other key roles in departments to deliver something". Interviewee 2.

"Develop processes, business models, facilitate the build-up of alliances with customers, support sales, program management. Requires job profile very similar to business manager". Interviewee 3.

"I am mainly responsible for then new and innovative projects within our company and for the transformation of the company, the partnerships. My partner is mainly responsible for the innovation and investment funds. We have also an investment fund which is investing in start-ups like corporates we see. But it is not a very long and detailed description". Interviewee 4.

"My role to study the project, evaluate if they need support, propose to committee, then develop the deployment of the project. So, I have to find people on all the stages". Interviewee 7.

All the interviewees agreed that OI specialists should have very broad background, multi- disciplinary approach, strategic thinking, creativity, curiosity, team-working ability, networking skills and open mind. Two interviewees compared the role of OI specialists with the role of *Business manager* and the role of *Strategic HR manager.* The importance of the hard skills was mostly neglected, though might be beneficial. However, one interviewee mentioned that it is not so important to have such specialists.

"We realised that in order to manage these complex types of relationships we need people with a profile that is much more similar to a business management profile. So people who understand all the different functions in the organisations. People who are comfortable with working with technical people, finance people with logistics people, customer service people. So those are people who have a much broader background than a typical sales person...We now have three guys working in that role. Multi-disciplinary approach that is

the essence indeed...We do mention that people should have at least a few years' experience in project management for instance, a few years' experience in business management, operations management, so it is typically a job that is not fit for a 25-year- old in that sense. And typically it is people with an MBA type of background". Interviewee 3.

"We are a very diverse team now. And I think the diversity really helps so I think openness and being keen on doing something are essential. But as well being able to balance the most distance stockholders you can imagine...Being a bit structured helps but being un- structured helps as well. I would not say it is the benefit to be only one of it. Of course, being creative is essential, seeing opportunities, seeing the big picture, being able to work in a team very-very important. Being able to work with different kinds of personalities and different backgrounds. Being able to work in a very diverse team, because you are working with marketing people but also very core business people, and IT people. Being persistent, that really helps...Being diplomatic helps, being un-diplomatic helps as well...About hard skills - I would not say they are very much needed. But, of course, it is also good if you have X background because you can put yourself into the shoes of the customer. So, I would not say that the hard facts are important because you can get them within a company. Open innovation is usually for companies which are bigger than whatever 100 people, and you have diverse skills

in that company. So, if you are lacking something, you will be able to get a person who will be able to help you in that". Interviewee 4.

"Curious, excited by new things, open mentality, but these competences are not written. So, we just see it from the interview". Interviewee 5.

"Sharing people, generous, people who do not mind to give, networking". Interviewee 6. Although, one of the opinions was that it is not important to have such specialists in the company:

"I think it is not important to have them but to show the way. But the main role would be to create links, to do networking, to be curious, enthusiastic, to increase spirit, have social skills, be open minded, creative, and positive". Interviewee 7.

The volunteer desire was mentioned as the main category to get the job roles like OI ambassador or OI broker (that person can try additionally to his/her official job title).

Among the most important skills and competences, the following qualities were mentioned (not in a consistent order): ability to work with different cultures, bringing the innovations, strategic thinking, inspiring, social skills, win-win relationship management (attitude + understanding how innovation works), risk-taking and psychological skills.

5. DISCUSSION

The main goal of the research was to understand the role of HR and organizational practices to foster open innovation in the organization. To achieve that goal, the sub-goals were established:

- - To identify the current place of HR in OI process;
- - To find the barriers to foster open innovation implementation in the organizations;

- - To elicit which HR and organizational practices can help to overcome those barriers;
- - To determine the role of HR in the process of open innovation.

To answer these questions, the findings were compared with the theory and the HR gaps consequently were detected. The data was grouped and analyzed in terms of set research goals. The chapter starts with the general understanding of OI concept including such issues as strategic approach, OI levels of adoption, OI main activities, OI measurement and responsibility. The next chapter analyses the current role and the possible involvement of HR in OI process. Then, the main challenges of OI implementation and the ways to overcome them from HR perspective are elicited. The OI as a job role has been excreted in another chapter. Each sub-chapter contains the reflection about the role of HR in particular process of OI. The discussion part terminates with the summary and future predictions and the of general comparative analysis of theoretical and practical findings with recommendations for the HR in OI. Table 13 presents the framework role of HR in OI process and emerged conclusions.

5.1. The Concept of Open innovation

Open innovation as a job growing tendency can be noticed by the working profiles in LinkedIn. By August 2016 there are more than 300 000 results of open innovation specialists' profiles that have "open innovation" in their job profiles (LinkedIn, 2016). Despite of this number, it was not easy to find the interviewees, which leads to the conclusion that probably; open innovation is still a matter of fashion rather than truly open approach. Also, it could be just lack of interest. During one of the interviews this question was raised and the interviewee mentioned the same problem among other "open" partners:

"I do not think that open innovation exists in the companies much – it is a buzz word that they mostly like to use to attract traditional collaboration partners. That is because there is no clear definition of open innovation. Some people will say "we work with people outside and we are open". But from my perspective, the ecosystem

is not open and very few companies actually have open innovation platform. And I looked on other innovation platforms of other companies, and to my perspective our platform is only actually open. And those platforms maybe closed and protective which might be good for them, but it does not help. And I think those people that you approached – they do not actually practice open innovation". Interviewee 2.

To compare theoretical and practical understanding of open innovation the definition of Chesbrough and Bogers (2014:17) was taken and divided on several components for comparative analysis. The first part of the theoretical definition is *distributing innovation process* which in interviewees' definitions finds more practical examples as: *innovation projects* and business *model*. The second part – *based on purposively managed knowledge flows across organizational boundaries*. It reflects in such word combinations as: *focuses own efforts on innovation, from external parties; within the company but taken externals; co-development; external inputs; taking knowledge and mind-set; new ideas from outside.* The third part – *using pecuniary and non- pecuniary mechanisms.* This can be aligned with such phrases as: *buy innovation from external parties, not alone made within the company; co-development; taking new ideas from outside.* The fourth component – *in line with the organization's business model*. Which can be compared with *differentiate itself from its competitors.*

Generalising, the understanding of open innovation was caught by the interviewees mostly in the second part; in going across the

organizational boundaries and cooperating with externalities, though without mentioning open innovation as *the process.*

Mortara et al. (2009) evidence that the implementation of OI usually is a strategic top-down approach, starting with development and implementation of OI strategy. The questionnaire has been done to find whether the companies already have their OI strategies or not and if they have, does HR take place in their Strategies?

As a result, the entire strategy of open innovation was found only at one company with full description, reasons of need, deployment, vision, mission and three main pillars of network, challenges and mindset. The *mindset* was separated as one out of three pillars of OI implementation. In the strategy, HR was mentioned as *an internal stakeholder of the overall value chain, designed to identify new business opportunities*. However, the interviewee of that company considers HR supporting OI process in recruiting only. As to build the mindset of the entire company, HR is not capable because they do not know much about OI. That is why, this goal and others are laying on the shoulders of R&D department.

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Other companies still do not have OI process integrated in their entire Strategies. Some of them mentioned OI strategy for R&D only, as there is no need for the whole company to be open. However, HR strategic goals were also mentioned independently from OI process, but as can be seen, they have the direct correlation with OI needs: (1) appropriate recruiting; (2) competence management; (3) visualising HR tools. From the point of strategical view, what if HR (or some part of HR) will be educated about OI? It will facilitate and accelerate the process to achieve that goal. If building corporative culture and appropriate mindset is not the role of HR – whose role is this? Except those, recruiting and competence management are strategic priorities for HR.

The classification was taken from Podmetina et al. (2016) research: non-adopters, planning to adopt, early adopters, experienced adopters. As this research showed, OI mostly is located at some part of organization (only two organization have OI as the company's entire process), hence different departments have different level of its adoption and understanding. Even if OI adoption is not required for all company, disbalance of OI understanding can complicate the process of cooperation between the departments. HR can become a communicator and educator for other employees. That will also softly prepare them for the global future changes.

Classification of open innovation activities is still under investigation. The literature review presents the classification of Chesbrough and Bogers (2014) including inbound, outbound and coupled activities. During the interviews, the following OI activities were determined: (1) spin- off; (2) partners/customers/university collaborations; (3) crowdsourcing; (4) open innovation platforms; (5) innovation outsourcing; (6) screening and starting start-ups; (7) partnerships in co-working; (8) corporative co-working; (9) rotating the employees within the same region; (10) making conferences for external talents in R&D. According to the theory, the amount of OI activities is larger than the interviewees have mentioned. Knowing the variety of such activities can increase absorptive capacity of the firm. Among mentioned practices, corporative co-working was mentioned – colliding the talented freelances (with particular knowledge that company needs but cannot invest a lot) with the employees on the creative office zone. HR can be active and create new open innovative solutions.

OI measurement was investigated by Linton (2002). This question has not caused any difficulties from the interviewees. They measure OI by the following categories: (1) project portfolio or business case; (2) the amount of OI engagements, interactions and follow ups, the quality of those interactions; (3) the number of successful products; (4) profit and loss; (5) KPIs like citations in media and academic articles; (6) the number of screened start-ups; (7) the difference between the amount of

discussions about the possible collaborations and the fact of collaborating; (8) the

amount of generated ideas. Definitely, the companies are interested in numbers and performance indicators. The measurement from OI activities is a common practice even nowadays. For HR, integrated in OI company, and practicing own open innovative methods, the measurement of the outcomes should be also developed. It could be special KPIs or as even the innovative HR consultancy applies *mathematical models* to measure their outcomes.

The responsibility of OI implementation is either centralized with OI team or spread over several departments (Mortara et al., 2009). The research shows, the companies attach OI mostly to R&D and their specific departments such as Department of Transformation and Market Management; Development and Sales department. The OI responsibility in the companies is distributed by creating additional job roles to manage OI process and creating indirect OI teams like OI ambassadors or OI brokers. One company considers *everyone is concerning to be open and find the ideas*, which is doubtfully can be achieved without OI implementation process at all.

The crucial finding is the fact, that OI process is happening and the new roles and responsibilities are formulating but HR is not well aware of it. HR is not identified as a part of OI team, and after all, it is not aware about how OI process flows in the company. In regard of consistent OI adoption, what if HR partner of HR director or some HR specialist will become the part of OI team and will be included in OI implementation process from the beginning? That will spread OI concept within HR department and will help to formulate particular responsible areas of HR in this process (e.g. reconsideration of HR position, development of competence management, recruiting, training programs, etc.).

5.2. Managing Open Innovation from Human Resources perspective

According to the literature review, this question has not been well investigated yet, but the researches stress the need of this investigation. Thus, it was emphasized by Vanhaverbeke, Chesbrough and West (2014); InnovationManagement (2013); Golightly (2012); Harwood (2010); Du Chatenier et al (2010) and Lichtenthaler et al (2011); Grant (1996); Kelley (2012), etc. The relation between HR and OI was presented by combination of Internal and External Talent Management which influence on organizational culture, which influence on employees' attitudes and behaviour and lead to OI effectiveness (InnovationManagement, 2013).

The practical side of the research showed the situation on the market following: some of the companies stress the role of HR in OI process, some companies are slightly interested in HR involvement. Though, some companies still do not think HR is needed for OI at all. The

discrepancy between the companies' requirements and HR functionality has been noticed. For instance, the companies prefer to educate their employees without involving HR, but at the same time, they request recruiting of people with OI mindset. At the same time, companies want all employees to work according to OI philosophy, but HR does not what OI is and how it works. Or the OI specialist already appear in the companies, but HR is not informed about that. Thus, OI specialists supplant HR role instead of using this strategic asset to support and maintain OI process. Nevertheless, those who consider HR important for OI identify the following areas of HR involvement: (1) Competence management; (2) Talent management; (3) Making the traditional HR processes more creative and innovative by itself; (4) Training, coaching, educating; (5) Creating OI culture; (6) People motivating.

5.3. Challenges and practices to foster Open Innovation Implementation

The interview guide contained the open question about the OI challenges and the ways to overcome them. Though, answering other questions, the interviewees also mentioned other barriers they have not considered from at first sight. This chapter, by the author opinion, accumulates all the issues that HR needs to know about OI process.

Previously, the challenges of OI implementation were explored in the literature already regarding HR involvement. Those findings were grouped according to following categories: (1) Not understanding of OI and barriers to open the boundaries; (2) Problems with external collaboration and engagement; (3) Challenges of organizational practices: NIH/NSH syndromes, knowledge sharing, creativity, innovation, motivation; (4) Country-level institutional challenges; (5) Other context challenges.

The challenges the companies have mentioned are the overall challenges of OI implementation. Hence, the idea of the interviews was to find the general regarding OI, and then to understand which of those challenges HR can help to overcome.

The general Internal challenges of OI were characterized as: (1) investment and risk in investment; (2) lack of top-management support; (3) lack of experience and understanding of OI (including competitiveness between the departments); (4) people's resistance (NIH, NSH syndromes) – mentioned in *Negative aspects of OI implementation* (Table 12).

The general External challenges of OI were found in: (1) external promotion; (2) partners' conviction; (3) appropriate recruiting.

Consequently, the interviewees proposed their solutions to the mentioned barriers: *Internally:* (1) building clear and explanatory communication; (2) competence management (including recruiting for external purposes). *Externally*: (1) external activities participation

(conferences, papers, etc.); (2) open discussion on the early stage of the project. HR can also take the role of solving *internal barriers* by building clear and explanatory communication with the employees concerning OI concept and way of thinking mostly from the entry point, during the period of adoption. Also, making educational programs and coaching sessions. Competence management, as already was mentioned, is the solution for many challenges on the way of OI as internally, as externally.

In theory, Mortara and Minshall (2014) created an OI implementation framework, where the successful outcomes of OI implementation are: enhanced economic performance, operational effectiveness, enduring change, human dynamics change. The negative outcomes are: unchanged economic performance, operational ineffectiveness, unsustained change, human dynamics unchanged. In criticism of OI, Elmquist et al. (2009) state that negative sides of OI excel the positive ones.

Eventually, on practice, the interviewees mentioned as many of positive sides, as many of negative sides. Even with a margin of positive ones: *Positive aspects of OI implementation:* (1)*"new business model of transformation";* (2) less bureaucracy; (3) less time of process making; (4) new opportunities; (5) differentiation from the customers; (6) employees' feeling of being proud and awake; (7) flexibility; (8) new services, e.g. easier process of payment; (9) better way of working; (10) more transparency; (11) win-win communication; (12) more external partnerships; (13) innovations in different areas of the company, e.g. safety, logistics.

Negative aspects of OI implementation: (1) distortion of traditional internal processes; (2) employees' insecurity and feeling fear to lose their job; (3) employees' feeling of losing control and importance; (4) negative human reactions on many levels; (5) complexity; (6) risk of innovation failures; (7) lack of experience to manage those failures; (8) employees' struggle with managing new kind of relationships; (9) risk

and fear of dishonest relationships; (10) internal misunderstanding where the money is spent; (11) demotivation.

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According to mentioned positive aspects HR can use positive aspects of OI implementation as a powerful tool of differentiation from the customers. These positive aspects like win-win communication, transparency, flexibility, less bureaucracy and others influence on the working atmosphere and can be promoted and presented as competitive advantages of the firm.

Negative aspects are mostly connected with NIH syndrome that give a massive field for HR role and practices. This is, probably, *the most important area,* where HR can support OI implementation and balance this process. Working with people, having individual approach, explaining the benefits of OI, psychological support, well-worked methods of adoption, change management. Also, *HR role requires innovative solution implementation itself*. The "ordinary and typical" role of HR slow down or even is not able to make OI implementation successful in the organization. HRM solutions for administrative process should be implemented, and HR can concentrate on humanistic side that OI requires - be more creative and innovative in its methods.

Dabrowska and Podmetina (2016) led the research and discovered following departments connected with OI: R&D, Strategic Management, Marketing and Sales, Corporate Communications, IT, Purchasing. This research added HR, Finance and Procurement to the list. Which means, OI is penetrating all the departments of the companies in more or less degree, or even finds the place in very new departments like *Market Transformation Department.*

Despite of this fact, people are still not aware of OI vastly. Though, as the interviewees mention that knowing the name of concept *open innovation* is not so important as knowing its content and practicing it.

The companies consider important to promote OI and they already do it externally and internally. *External promotion:* (1) social media promotion (e.g. LinkedIn, Twitter); (2) participating in conversations with customers explaining the business model of OI; (3) events like Scientific Challenger (inviting start-ups from outside and give them stage inside to find the best ideas to invest, cooperate with them or even turn into spin-offs).

Internal promotion: (1) innovation ambassadors' promotion; (2) personal blog to promote entrepreneurship; (3) internet community, intranet; (4) newsletters; (5) internal big events, promo- actions; (6) reckon with Master Research ideas; (7) internal educational program of "OI Ambassadors Journey".

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Due to the mentioned ways of promotion HR can help to fulfil the corporative culture with OI spirit. OI promotion by HR can be carried out externally by social media for building the organizational image and attracting "right" candidates using creative advertisement and internally, by announcing OI events and motivating people for OI activities; identifying people for "OI Ambassadors Journey" – the program that one company developed for OI ambassadors; making innovative and creative adoption period and integrating newcomers according to OI culture. Also, attracting Master Thesis students for practice and finding the solutions for company problems.

A lot of literature was devoted for the importance and problematics of organizational culture. It was mentioned as internal barrier by Not Invented Here syndrome (Cohen and Levinthal, 1990) and by other contributors like West and Gallagher (2006); Lichtenthaler (2011); Katz and Allen (1985). Mortara et al. (2009) stress four main issues that companies should analyse in terms of top-down adoption of open innovation inside the company: *culture, procedures, skills, and motivation.* HR management based on investing in human capital, rewarding employees for performance and their new ideas and enhanced

teamwork have been emphasized as an essential part of innovative culture by Black and Lynch (2001), Fu (2012), Laursen and Foss (2003).

The interviewees stressed organizational change as one of the main barriers toward OI implementation. *"Innovation is a part of culture. When you want to innovate just in the process - you touch the culture".* Interviewee 6. *"Thus, sharing the ideas happens* more *in development, less in manufacturing*". (Interviewee 3). As one company mentioned, they even have the internal competition between the departments. Even the fact, that Sharing the ideas is not very popular, it happens more internally than externally.

The attitudes toward failures and risk-taking perceive in the companies are perceived as learning lessons mostly, but they are still hard to accept in some organizations. Risk-taking is promoted only if it can be successful, which is controversial to the nature of risk. Though, it is a part of culture in companies with strong entrepreneurial promotion. *Rewarding* mechanism for OI participation is still under discussion. Most companies have tendencies to non-monetary approach and shift from individual to group KPIs. Cultural change is a tremendous goal needed for OI shift. Change management strategy and practices are highly needed. Educating, coaching, training, managing – are the solutions to this problem. Organization of the events with successful and unsuccessful stories can stimulate the entrepreneurship risk-taking mentality. Rewarding mechanism for OI is still under consideration and it is needed to be developed. Non-monetary

rewards are the considered as desired practices for OI mentality. The role of HR is obvious and indispensable in this context.

5.4. Open Innovation as a Job role

The interesting fact is, that one of the interviewees learnt about open innovation "*Fifteen years ago in another company".* Interviewee 3.

Though, as we know, officially the term *open innovation* appeared in 2003 (which is 13 years ago). That refers to the critics of open innovation, and such authors as: Dahlander and Gann, 2010; Knudsen and Mortensen, 2011; Ozman, 2011; Piller and Walcher, 2006; Groen and Linton, 2010; Oakey, 2013; Trott and Hartmann, 2009; Mowery, 2009; Chandler, 1990; Freeman, 1974; Pavitt, 1984; von Hippel, 1986) claiming, that the concept is not already new and the open companies' boundaries have been under the research for a long time. As another interviewee noticed, that they started to work on open innovation even without knowing how it is called. Another interesting finding was to realise that some of the interviewees heard about open innovation in the university (between 2012-2014) under Entrepreneurship program.

Generally, the education of open innovation is not spread yet, people tend to know this concept through their working place for the first time. Even among new alumnus there always will be those who have not heard about it. So, the organization has the "responsibility" of introducing this concept to its workers. As fast and more efficient the organization can do that – as fast and more competitive it can become, as soon the quality of the whole industrial process will change. Logically, the organization will gain more benefits from such mindset of their employees.

Dabrowska and Podmetina (2016) made a significant research to draw a picture of OI specialist. Along with listed OI activities one of extra task from Human Resource Management (Talent Management) was mentioned in one job offer of Chemical industry. OI-Net project identified required skills and competences for OI specialists (Podmetina et al., 2016). Additionally, by August 2016 there are more than 300 000 results of open innovation specialists' profiles that have *open innovation* in their job profiles (LinkedIn, 2016).

Comparing with Dabrowska and Podmetina (2016) research, the job titles of the interviewees connected with OI are more accurate with *innovation* or *open innovation* combination in the titles directly, and

their job roles express the same activities as were mentioned by Dabrowska and Podmetina (2016). Surprisingly was to find the innovative HR role, as by the conducted interviews, HR perceived as supportive and administrative role. This phenomenonon can be connected with

the fact, that most of the interviewed companies are large companies, where the obedience and discipline are prevailing, and HR has loads of administrative job still. Looking upfront, probably, this fact could be changed by implementing e-tools, which are forecasted for the interviewees in the nearest future.

As practice showed, the job roles of OI specialists, their backgrounds and responsibilities are diversified, but they have general job descriptions or no job descriptions at all. According to the interviews, their *open innovative* job roles appeared due to the top-down approach in most of the cases, that proves the statement of Mattes (2011) that OI implementation should be supported by leadership (top-management). The OI specialists are located in different sectors of organization like R&D, *Sales and Development, Market Transformation Department* – even such departments that never existed before. OI specialists also have new names of their job titles, e.g. *Group Program Manager.* More often *OI ambassadors* – people that work in the company but also promote OI within their departments and *OI brokers* – to connect organization with innovators. OI specialist profile was compared to the profiles of Business manager and Strategic HR manager.

The OI specialists' responsibilities: (1) Run OI projects and measure them; (2) Establish and implement OI strategy; (3) Building relationship with the partners in OI model; (4) Running new and innovative projects; (5) Transformation of the company; (6) Project work, finding "right" people.

*Skills and competences desired (*everyone mentioned): multi-disciplinary approach (ability to work with people of different backgrounds), strategic thinking, creativity, curiosity, team-working ability, networking skills and open mind. Other skills and competences: ability to work with different cultures, volunteer desire, bringing the innovations, strategic thinking, inspiring, social skills, win-win relationship management (attitude + understanding how innovation works), risk- taking and psychological skills.

As interviewees mentioned, OI specialists should really think how maximally to use HR function in the process of OI. Some of them already started to teach HR to serve their common goal of openness. The developed job description can help to understand which people are desired for such position and make the process of recruiting more effective. Collected job descriptions of OI specialists can serve for the partners of organization, to make the process of co-operation more effective. HR can "collect" such job descriptions as practices from other partners to understand the variety of possible OI specialists needed in the processes of OI. So, the companies can speak

in one note and have the required role documented. However, the job descriptions start with internal investigation of understanding the responsibilities of OI specialists, the research of OI process in the organization.

If the soft skills are more important for the job of OI specialists (as mentioned by the interviewees), practically that means, that such a job role is possible in any department of organization and the hard skills will serve as the "anchor" of such determination. The training and coaching of required soft skills is an iterative and necessary process. HR can also take the responsibility in it.

Clearly, that OI specialists have strategic goals internally and externally, and to achieve them, the help is needed. HR can be supportive and

powerful tool of internal change. However, the research showed that HR even might not know about OI specialists existing or about new job positions within OI processes. At the same time, companies are expecting strong competence management support and appropriate recruitment from HR. Moreover, how HR can satisfy this need without knowing exactly which people are needed, with which competences and responsibilities?

5.5. Summary and Future Predictions

The theoretical rationale of HR has been very well presented by Bakke (1958) (Table 5). The main roles of HR have been grouped to the following categories:

- - To know realistically and potentially the nature, potentialities, constrains and conditions of employment in the resource;
- - To understand and maintain the adequate quality and quantity of the recourse for the company;
- - To develop and extent possible potentials and opportunities for the resource;
- - To employ or utilize the resource for the optimal level for the effective company's work;
- - To integrate all the efforts and the recourses to achieve the desired result.

The research shows that HR still has more passive and administrative role in the organizations, though the range of HR activities is much larger. Even to perform the duties written in the theory - is a rarity. Open innovation changes the way (the culture) of working, it brings new specialists with new responsibilities, it transforms the market and business relationship. Without strong adoption of this process, companies will not be able to achieve openness and the benefits that it offers. All in all, OI is around people, and HR has to perform its duties. Educating HR about OI is

an obvious requirement, and maybe OI will put HR to its place instead of mechanical role that most of the people prescribe to HR.

Does the HR role is actually needed in the future? Can HR be so flexible and adaptive to know about all the changes that are going to happen within the organizations? Or HR function will be distributed among such new conjunctive job roles like OI specialists? If there will not be HR function per se, the "people oriented" organizational practices will still be needed. This is a big process that requires planning, managing and control. Will the organizations be able to balance their departments without the unit responsible for people? If it is possible to leverage it in micro companies and SMEs, what about the large organizations?

The interviewees forecast that HR departments will significantly minimize their size in administrative function due to the implementation of e-tools, and the role of HR will become more strategic with individual approach. The interviewees also predict that the term *open innovation* will be integrated in common people mindset. Which is going according to the other forecasts (The report of the Future of Jobs – WEF, 2016). Therefore, to enter that level, lots of work is required. Indeed, we do not know will these categories exist or not, maybe they need each other to create the new era of industrial management and then carefully disappear as the good design is always invisible. The experience of micro companies is exactly about that. The innovative HR consultancy that has been interviewed, already shows the way how effectively HR can work, establishing corporative co-working or redesigning the original HR processes, applying design methods. Even the way of the organizational structure applies OI thinking: all employees are temporary invited specialists with unique skills needed for particular project task. The power of network is immensely high in such context, and big organizations should learn this experience, as the future predictions of HR and OI are going in line with it.

Finalizing the Discussion part, Table 13 presents the framework of the role of HR in OI process.

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Table 13. The framework of the role of Human Resources in open innovation process

Theory	Results and Findings	Recommendations to the role of HR to foster OI/ HR and organizational practices
OI measurement		
How companies measure OI outcomes: - project portfolio or business case		
Understanding of Open innovation		
OI Strategy Mortara et al. (2009) evidence that the implementation of OI usually is a strategic top-down approach, starting with development and implementation of OI strategy.	- The entire strategy of open innovation was found only at one company with full description, reasons of need, deployment, vision, mission and three main pillars of network, challenges and mindset. - Mostly, the companies still do not have OI integrated in the companies' Strategies. - Another company mentioned HR strategic goals: - appropriate recruiting; - competence management; - visualising HR tools.	Strategic Development of HR: - HR educating about OI; - HR activation and integration in the process of OI; - Development of Competence Management Strategy - Development of Talent Management Strategy, including appropriate recruiting

		methods. - Development of Change Management Strategy.
OI level of adoption The classification was taken: non-adopters, planning to adopt, early adopters, experienced adopters (Podmetina et al., 2016).	- Open innovation is located at some part of organization, hence different departments have different level of its adoption and understanding.	- Communication and education about OI for other employees to keep other departments in balance and softly prepare for the future changes.
OI main activities Classification of open innovation activities (Chesbrough and Bogers, 2014) including inbound, outbound and coupled activities.	The following OI activities were determined: - spin-off, - partners/customers/university collaborations - crowdsourcing - open innovation platforms, - innovation outsourcing - screening and starting start-ups - partnerships in co-working - corporative co-working, - rotating the employees within the same region - making conferences for external talents in R&D	- Corporative co-working – one of the examples of open innovative HR practices.

Was found by Linton (2002)**:** economic performance in terms of performing quantifiable economic indicators by innovation and operational effectiveness in terms of improving the operations in qualitative measurements.	- the amount of OI engagements, interactions and follow ups, the quality of those interactions - the number of successful products - profit and loss - KPIs like citations in media and academic articles - the number of screened start-ups - the difference between the amount of discussions about the possible collaborations and the fact of collaborating, - the amount of generated ideas.	- For HR in OI company, practicing open innovation methods: special KPIs should be developed. Or as the innovative HR consultancy applies mathematical models to measure their outcomes.
OI responsibility The responsibility of OI implementation is either centralized with OI team or spread over several departments (Mortara et al., 2009).	The companies attached OI to the following departments: R&D; Department of Transformation and Market Management; Development and Sales department. - The companies create additional job roles to	- Integration of HR in OI team. - Development of HR responsibilities in OI process.

	manage OI process and create indirect OI teams like OI ambassadors or OI brokers. Another company considers *"everyone is concerning to be open and find the ideas*".	

Managing open innovation from HR perspective

The role of HR to foster OI	**The current role of HR in OI process:**	**Potential HR roles in OI:**
- The role of HR in OI is a gap that was also noticed and emphasized by Vanhaverbeke, Chesbrough and West (2014) as a call and encouragement for the researches to investigate more about HRM and OI implications. - The scholars and researchers mention the gap concerning the role of HR practices and HR professionals in open innovation (InnovationManagement, 2013); Golightly (2012); Harwood (2010); Du Chatenier et al (2010) and Lichtenthaler et al (2011); Grant (1996); Kelley (2012), etc. - The relation between HR and OI was presented by combination of Internal and External Talent Management which influence on organizational culture, which	There is no common answer to that question: some of the companies stress the role of HR in OI process, some companies are slightly interested in HR involvement. Though, some companies still don't think HR is needed for OI at all.	However, those who consider HR important for OI process identify the following areas of HR involvement: - Competence management; - Talent management; - Making the traditional HR processes more creative and innovative by itself; - Training, coaching,

influence on employees' attitudes and behaviour and lead to OI effectiveness (InnovationManagement, 2013).		educating; - Creating OI culture; - People motivating.

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The challenges and practices to foster open innovation implementation in the organizations

General internal and external barriers of OI implementation - Misunderstanding of OI and its activities on practice as mentioned by Trott and Hartmann (2009), Oakey (2013), Christensen (2012). Other: - Identifying and incorporating external knowledge - Motivation and managing of external sources - The need of organizational capabilities development	*General Internal challenges:* - investment and risk in investment; - lack of top-management support; - lack of experience and understanding of OI (including competitiveness between the departments); - people's resistance (NIH syndrome) – mentioned in *"Negative aspects of OI implementation".* *General External challenges*: - external promotion; - partners' conviction	**Practices and recommendations to overcome the barriers with the help of HR:** From the interviewees the solutions were found: *Internal solutions:* - building clear and explanatory communication - competence management *External solutions*: - external activities participation (conferences, papers, etc.) - open discussion on the early stage of the project

- Culture (NIH, NSH) - Internal R&D capacity - Balance between closeness and openness	(lack of trust); - appropriate recruiting.	- HR can take the role of solving *internal* barriers by building of communication internally and by competence management as internally, as externally (recruiting).
Positive and negative outcomes of OI implementation In criticism of OI Elmquist et al. (2009) state on the negative sides of OI above the positive ones. - Mortara and Minshall (2014) created an OI implementation framework, where the successful outcomes of OI implementation are: enhanced economic performance, operational effectiveness, enduring change, human dynamics change. And negative outcomes: unchanged economic performance, operational ineffectiveness,	*Positive* - *"new business model of transformation"* - less bureaucracy - less time of process making - new opportunities - differentiation from the customers - employees' feeling of being proud and awake - flexibility - new services, e.g. easier process of payment - better way of working - more transparency - win-win communication - more external partnerships - innovations in different areas of the	- Using positive aspects of OI for internal promotion and external presentation as competitive advantages of the firm. - Negative aspects - is *the most important area*, where HR can support OI implementation and balance this process. Working with people, having individual approach, explaining the benefits of OI, psychological support, well- worked methods of adoption, change management. - *HR role requires innovative solution implementation itself*, like HRM solutions for reduction of administrative processes,

unsustained change, human dynamics unchanged.	company, e.g. safety, logistics. *Negative* • - distortion of traditional internal processes • - employees' insecurity and feeling fear to lose their job • - employees' feeling of losing control and importance • - negative human reactions on many levels • - complexity • - risk of innovation failures • - lack of experience to manage those failures • - employees' struggle with managing new kind of relationships	increase attention on creative and innovative methods and humanistic side that OI requires.

	• - risk and fear of dishonest relationships	

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- internal misunderstanding where the money is spent - demotivation

OI awareness and promotion - Departments connected with OI: R&D, Strategic Management, Marketing and Sales, Corporate Communications, IT, Purchasing (Dabrowska and Podmetina, 2016).	- People are still not aware of OI vastly. Though, knowing the name of concept is not so important as knowing its content and the idea. - Departments, involved in OI process in the companies: R&D, HR, Finance, Sales, Procurement and Marketing. *External promotion:* - social media promotion (e.g. LinkedIn, Twitter) - participating in conversations with customers explaining the business model of OI	- HR can help to fulfil the corporative culture with OI spirit. - Externally, by using social media for building the organizational image and attracting "right" candidates with creative advertisement. - And internally, by announcing OI events and motivating people for OI activities; identifying people for "OI journey"; making adoption period creative and integrating newcomers according to OI culture. Also, attracting Master Thesis students for practice and finding the solutions for company problems.

	- events like Scientific Challenger *Internal promotion:* - innovation ambassadors' promotion - personal blog to promote entrepreneurship, - internet community, intranet - newsletters - internal big events, promo-actions - reckon with Master Research ideas - internal educational program of "OI Ambassadors Journey"	
Organizational culture - Organizational culture was mentioned as internal barrier by Not Invented Here syndrome (Cohen and Levinthal, 1990). Other contributors - West and Gallagher (2006); Lichtenthaler (2011); Katz and Allen (1985).	- *"Innovation is a part of culture. When you want to innovate just in the process - you touch the culture".* *Sharing the ideas:* - More in development, less in manufacturing – can lead to internal	- Cultural change is a tremendous goal needed for OI shift. - Educating, coaching, training, managing – are the solutions to this problem. - Organization of events with successful and unsuccessful stories can stimulate the

- Mortara et al. (2009) stress four main issues that companies should analyse in terms of top-down adoption of open innovation inside the company: *culture, procedures, skills, and motivation*. - HR management based on investing in human capital, rewarding employees for performance and their new ideas and enhanced teamwork have been emphasized as an essential part of innovative culture by Black and Lynch (2001), Fu (2012), Laursen and Foss (2003).	competition between the departments. - Sharing more internally than externally. *Attitude toward failures and risk-taking:* - Learning by failure mostly, but still hard to accept in some organizations. - Risk-taking is promoted only if it can be successful. *Rewarding:* Question under discussion. Most tendencies are – non-monetary and shifting from individual to group KPIs.	entrepreneurship risk-taking mentality. - Rewarding mechanism for OI is still needed to be developed. Non-monetary rewards practices. - Change management.

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Open innovation as a job role

Knowledge about OI (Chesbrough, 2003)	- Generally, people firstly met OI at job	- Presenting OI concept to its new

		employees as desired mind-set of the organization
Responsibilities, skills and competences Dabrowska and Podmetina (2016) - According to Dabrowska and Podmetina (2016) research along with listed OI activities and responsibilities one of extra task from Human Resource Management (Talent Management) was mentioned in one job offer of Chemical industry. - Podmetina et al. (2016) identified required skills and competences for OI specialists: 1. Communication; 2. Team work; 3. Networking; 4. Problem-solving; 5. External collaboration; 6. Trust; 7. Internal collaboration; 8. Entrepreneurial mind-set; 9. Negotiating; 10. Leadership; 11.	- The job roles of OI specialists and their backgrounds, responsibilities are diversified, but there are general job descriptions or no job descriptions at all. - The OI specialists are located in different sectors of organization like R&D, *Sales and Development, Market Transformation Department* – even such departments that never existed before. - OI specialists also have new names of their job titles, e.g. *Group Program Manager.* More often *"OI ambassadors"* – people that work in the company but also promote OI within their departments and "*OI brokers"* – to connect	- As interviewees mentioned, OI specialists should really think how maximally to use HR function in the process of OI. Some of them already started to teach HR to serve their common goal of openness. - Developed job descriptions can help to understand which people are desired for such position and make the process of recruiting more effective. These descriptions can be collected from other partners (to understand the variety of possible OI specialists needed in the processes of OI), and at the same time - serve for the partners of organization, to make the process of co-

Multitasking; 12. Virtual collaboration; 13. IP-management. - By August 2016 there are more than 300 000 results of open innovation specialists' profiles that have "open innovation" in their job role (LinkedIn, 2016).	organization with innovators. *Responsibilities:* - Run OI projects and measure them - Establish and implement OI strategy - Building relationship with the partners in OI model - Running new and innovative projects - Transformation of the company - Project work, finding "right" people *Skills and competences:* - Everyone mentioned: multi-disciplinary approach (ability to work with people of different backgrounds), strategic thinking, creativity, curiosity, team-working ability, networking skills and open mind. - Other skills and competences: ability to work with different cultures,	operation more effective. - The training and coaching of required soft skills is an iterative and necessary process. HR should also take the responsibility in it.

	volunteer desire, bringing the innovations, strategic thinking, inspiring, social skills, win-win relationship management (attitude + understanding how innovation works), risk-taking and psychological skills. - Similar profile to "Business manager" and "Strategic HR manager".	

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6. CONCLUSION

The role of HR and organizational practices was explored by this research. This topic has not been investigated much before, but was required by the scholars of open innovation paradigm. The research project met the research objectives and found the answers to the following research questions:

RQ 1: What is the current place of HR in the process of OI?
RQ 2: What are the barriers of open innovation implementation?
RQ 3: Which HR and organizational practices can help to foster implementation of OI in organizations?

To answer these questions, the literature review on the issues of open innovation and Human Resources concepts have been made and eight in-depth interviews from the open innovation specialists have been conducted and analyzed in accordance with the developed Interview

Guide. As the result of the analysis, the managerial implications have been formulated and the framework of the role of HR in OI process has been developed.

Answering the first research question, the current place of HR in OI has been more emphasized through the theory. From practical point of view, there is no common answer to that question: some of the companies stress the role of HR in OI process, some companies are slightly interested in HR involvement. However, some companies still do not think HR involvement is needed for OI at all. Overall, the role of HR is passive and supports organisations with administrative functions. This result could be due to the size of the interviewed companies – large companies. As such organizations are full of administrative regulations and bureaucracy. On the other hand, as larger the company – as more the work with people it requires. Thus, the activation HR function might be harder, but can give more global effects over the organization.

The second goal was to find the barriers of OI implementation, that have been detected from many angles of OI. The main *internal barriers* were determined as: investment and risk in investment; lack of top-management support; lack of experience and understanding of OI (including competitiveness between the departments); and people's resistance (NIH, NSH syndromes). The main *external barriers* are: external promotion; partners' conviction (lack of

trust); appropriate recruiting. These problems already have been covered by the previous researches more or less. Though, external promotion and appropriate recruiting are quite new. This could be connected with the extra need of OI specialists who could link the companies and accelerate OI collaboration.

The third question was devoted to find the solutions to overcome those barriers from the point of HR and organizational practices. From the interviewees, according to internal barriers the solutions were found: in

building clear and explanatory communication and competence management. For *external barriers*: external activities participation (conferences, papers, etc.); open discussion on the early stage of the project. HR can take the role of solving *internal* barriers by building of communication internally and by competence management as internally, as externally (recruiting).

6.1. Managerial implications

However, during the interviews, the possible roles of HR have been noticed due to other problems of OI implementation. Basis of which, the managerial implications were formulated. First of all, HR could be involved in OI implementation team to be a part of OI strategy regarding its goals in human resources needs. Secondly, much is needed on cultural transformation, explaining OI process to the employees, keeping them in emotional balance, practicing openness, knowledge sharing, identifying people with OI mindset, educating/coaching/training. Other activities of HR in OI are proposed in: OI promotion (during the interviews and job advertising), networking (building the company's database), developing appropriate adoption programs with OI context, using innovative methods (like corporative co- working), development of KPIs and rewarding systems to OI. Finally, several chapters have been devoted to open innovation as a job role, considering required skills, abilities and responsibilities, which is highly important knowledge for HR specialists' attention and the future investigation.

Generally, the main areas of HR involvement have been identified in: Competence management; Talent management; Making the traditional HR processes more creative and innovative by itself; Training, coaching, educating; Creating OI culture; People motivating. That means, that HR has a lot of work to do in OI and its practices can really help to overcome the barriers of OI. HR should become more strategic and active as OI needs help to be implemented in the organizations appropriately.

6.2. Limitations and further research

To finalize this research, it is necessary to emphasize its main contribution: (1). The attention of the role of Human Resources in open innovation process has been raised; (2) The theoretical overview of Human Resources involvement in open innovation has been done; (3) The framework of the role of Human Resources in open innovation process has been built.

However, the research has met its limitations. Firstly, it has not found very active response through open innovation network and the time constrains limited the number of the interviews. Secondly, the results are based on eight interviews only, mostly from large companies of different industries, located in Europe. Thirdly, the interviewees have different specialization in open innovation, some of them connected to open innovation indirectly. And finally, the answers of the interviewees might be misunderstood and misinterpreted.

Hence, to validate the results the future research recommendations would be to apply the same interview questions to more number of the interviewees from large companies, also to SMEs, including the non-European companies. The research could be conducted by particular industries as the results could depend on this variable. Besides, it would be be fruitful to conduct interviews with other internal (e.g. HR staff) and external stakeholders as a future avenue to extend the research.

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