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Perception of Innovation For the Next 25 Years: International Perspective

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Abstract

The fundamental purpose of this study is to analyze and comprehend the international future perception of innovation in the next 25 years by the academicians, international organizations, associations of innovation professionals. Along with the use of a semi-structured questionnaire for a sample size consists of 31 professionals from 12 countries, professionals are asked to express their perceptions about the triggers and obstacles of innovation, innovative sectors and status of human resources in future. According to the results; professionals' perception of innovative sectors intensify in medical, health, information technology and renewable energy. The respondents emphasized that qualifications of future human resources are expected to be more creative, flexible, communication based and co-creative. On the other hand, threats for innovation in future is perceived to be financing, lack of applications of policies and fear of change etc. Details are given and discussed within the research. The study sheds a light on future innovation perceptions of professionals from different countries and backgrounds.

Keywords: Innovation, International Perception, Future of Innovation, Threats

1. Introduction

In today's chaotic business environment, the corporate world is searching for ways to gain competitive advantage (Chiou et al., 2011; Baker and Sinkula 2002; Utterback, 1994), to be different, to bring added value to what is produced, served and managed, to be more creative and to think out of box. Through this complex environment, innovation plays a significant role in terms of gaining competitive advantage and surviving in the global arena. As Morgan (2015) stated; as the world of business continues to evolve at a fast pace, innovation continues to become both a top priority and a top challenge.

So as to succeed and thrive in this fast changing world, organizations must adapt by implementing new innovative models and internalize the innovative perspective (Tidd, 2006; Brown and Eisenhard, 1995; Daft, 1982). The necessary fundamental

inputs such as qualified human capital, creativity, enthusiasm, willingness to change, value additions, competitiveness and future view of innovative activities should also be included in innovative perspective. Though there is a variety of understandings and perspectives about innovative approaches, and organizations should be aware of the future perspective of the notion of innovation in order to succeed in this rapidly changing business environment (Lager, 2016). That is why the fundamental purpose of this research is to analyze and comprehend the future perception of innovation and innovative efforts in the business world for the next 25 years.

In the first part of this study, the theoretical background about the concept of innovation and the future perspectives of innovation will be studied. Furthermore, the methodology, findings and the assessment of the indications will be addressed briefly. In the last part, the conclusion and implications of research analysis based on the responses, research constraints and the future research suggestions will be provided.

2. Notion of Innovation

There are various definitions of innovation in literature (e.g. Freeman, 1982; Leonard-Barton, 1995; OECD-Eurostat, 2005; Stone et al., 2008; Schoemaker, 2015). According to Oslo Manual, innovation is the implementation of a new or essentially developed product (service or good) or process, a new marketing method or application or a new organizational method in business practices, workplace organizations or external relations (OECD-Eurostat, 2005, p. 46; Damanpour, 1991). Innovation is defined as adoption of an internally generated or purchased device, policy, process, program, service or product that is new to the adopting organization (Damanpour and Evan, 1984). Moreover, Yanchenko (2013) underlines the notion of innovation as; a system, a process, a result, a tool, a new object or the transformation of existing state.

Innovation can also be viewed as a diverse activity; it can take place in research labs, factory floors, universities, libraries and coffee shops, or even over a beer after a tough work day, and there is no monopoly on creative thinking. It can also occur with a single person or a collective participation. However, according to Karaata et al. (2016), to call it as an innovation, it has to take place in the commercial activities and as an example, the product, service or the marketing technique should be commercialized. In other words, Freeman (1982) highlighted that an innovation in economic sense is accompanied with the first commercial transaction involving the novel product, process or system.

In light with the involvement of new products, processes or systems with commercial transactions, for instance, lately as Bach et al. (2016), Schoemaker (2015) or Shaughnessy (2013) highlighted that to be able to survive in tough business conditions, the development of innovative perspectives or approaches will matter more and be critical for the future.

3. Perspective of Innovation in Future

There are several authors and researchers discussing the future of innovation, innovative activities and developments (Schoemaker, 2015; Shaughnessy, 2013; Trifilova and Von Stamm, 2009). These studies focus on the future of family businesses (De Massis et al., 2016), service innovation in IT (Barrett et al., 2015), technological improvements (Weber, 2016), future of innovation in public sector (Bach et al., 2016),

digital system trends (Morabita, 2016) etc. Though a general evaluation followed by a qualitative analysis is novel for the literature.

As Peter Drucker underlined when he gave an interview to James Daly, editor of Business 2.0, a well-known business magazine at that time, *"The corporation we know is unlikely to survive the next 25 years. Legally and financially, yes. But not structurally and economically."* (Daly, 2000). So organizations keep up pace with the changing circumstances and adapt, in fact they are gradually embracing the power of openness and innovation - not only services or products, but also processes and several types of business models. This is a new way of being for businesses, to go after opportunities and at the same time managing risks that come along with globalization (Shuman and Twombly, 2010). Besides the academic research, to be able to understand various perspectives of innovation, it is pivotal to allow for the views of experts. Schoemaker (2015) highlighted that four trends will drive new ideas and breakthroughs in the business environment;

- *Quantum Innovation:* Outside the box thinking that is disruptive to competitors and the organization. Reimagining the globe differently but it may not fit the current business model and organizational structure.
- *New Organizational Forms:* Conventional 9-to-5, Monday-through-Friday work is giving way to new organizational forms. Virtual companies; internal and external networked partnerships, companies that spin off new startups are seen now. Other forms include organizations which focus on existing products while creating new ones or markets, placing customers at the center of activities.
- *Reverse Innovation:* The globe is no longer a one-way outsourcing road moving from West to East. While the West still exports high-end products, services to developing countries, innovations in emerging markets are now flowing back to the West. This is happening with Brazil, India, China in various fields as biofuels, IT and medicine.
- *Harvesting Failures:* Many breakthroughs came out of failures and many of them are portals of discovery. Adopting a tolerant mindset about mistakes opens the way for testing new processes, projects. Rather than wait for mistakes to occur, companies may encourage deliberate mistakes, to test beyond belief system - just to see. Such experiments can't be justified using cost-benefit analysis. They require leaders and a culture that view mistakes as portal of discovery.

Schoemaker (2015) also underlines that the world is changing at a high speed and innovation becomes an organization's most important weapon. According to him, history presents a few key lessons about how to use that weapon in future: 1. Not limiting yourself to just innovate from within your company. 2. Aiming high, otherwise, incremental innovation can cause you to miss out on breakthrough opportunities. 3. Experimenting with new organizational structures that are horizontal, agile. 4. Practicing innovation learned from bottom of the pyramid as well as top. 5. Viewing mistakes as portals of discovery and, 6. Cultivating leaders who thrive on uncertainty, take the long view, champion change.

A book edited by Trifilova and Von Stamm (2009), named "The Future of Innovation" covers various academicians and topics, more than 200 participants from various countries, so offers a broad range of perspectives to readers. Though the

opinions are not analyzed through an academic method. Relatively, this study covers less number of participants, though analyzes the opinions of experts via content analysis.

4. Classification of Perspectives

There are several structures, categorizations or perspectives used to model product innovation and innovativeness such as product innovativeness (Lawton and Parasuraman, 1980; Mishra, Kim and Lee, 1996), radicalness (Chandy, Tellis, 2000), product uniqueness (Cooper, 1979), product complexity (More, 1982), technical content (Lee and Na, 1994) and newness of technology (Goldenberg, Lehman and Mazursky, 1999). For instance, according to Garcia and Calantone (2001), a technique for classifying innovations is recommended so that practitioners and academics can talk with a common understanding of how a specific innovation type is identified and how the innovation process can be unique for that innovation type.

Despite various classifications, in this research, the results first will be categorized according to the content itself, than will be evaluated under two categorizations which are considered to be Shaughnessy's (2013) perspective and Stone et al. (2008). The first approach is considered to be more appropriate according to the initial evaluation of the raw data, even so the categorization is not strictly used for some questions. The second approach of Stone et. al. (2008) is a time-based explanation, which is considered to be different with respect to above mentioned classifications.

Shaughnessy's (2013) perspective and approaches of participants will be classified accordingly. According to the author, there are six characteristics driving the future of innovation;

- *Fluid core:* In place of a rigid "core competency" smart organizations now define a fluid core that lets them adapt to novel strategic priorities, mainly the need to seek out new markets, opportunities.
- *New service infrastructure:* Cloud and mobile enable rapid service development and innovation paradigms. Cloud, mobile and peer-to-peer networks let us move big amounts of data around at the press of a button, free. They allow us to do personal data monitoring.
- *Radical adjacency:* Pursuit of new products and markets are called radical adjacency - strategies that adventurous companies develop to dominate markets where they have little experience. Organizations will have to gain skills across hardware, software, service and communications to innovate at industrial areas, like medical and mobile or display and advertising.
- *Personal innovation drivers:* This characteristic is concerned about drivers of innovation and novelty, human desire bringing empowerment, disrupting systems. Author predicts maker revolution or individual biology labs for the future of human related innovations.
- *Externalization:* Organizations need to shift the burden of management on to their ecosystems. In this new business environment, organizations go outside their walls for functions that are focal to their identity and success. Externalizing core processes is an essential element of scale.
- *Strategic options portfolios:* Organizations need to plan a wide range of innovations knowing that most of them won't be enacted.

The second classification is the approach of innovation divided into four phases (Stone et al., 2008):

- 1st phase: In the first phase, between 1950 & 60s, the main focus was on inputs in innovation measurement. These inputs were research and development, capital and intensity of technology.
- 2nd phase: Between 1970 & 80s, due to science and technology activities, attention was on main outputs as publications, patents, products and transformation of quality.
- 3rd phase: In 1990s, fundamental focus was on the results of survey research. This phase contains the comparison of innovation capacities, surveys, indices.
- 4th phase: In 2000s, process indicators became significant which are information, intangible resources, demand factor, network structures, managerial techniques, return of risk and system dynamics. Accordingly, within this study perspective of participants is expected to be related to the fourth phase.

In fact, all these stages in different eras will not only help the organizations, researchers and practitioners understand the concept and measurement techniques of innovation, and innovative efforts from various dimensions but also will influence the future approaches, trends and views of innovation.

5. Research Framework and Methodology

5.1. Purpose of Research

To be able to succeed in this fast changing business life, future perspective of the notion of innovation is essential for businesses, international organizations, researchers and innovation professionals. Relatively the primary purpose of this research is to analyze and understand the future of innovation for the next 25 years.

By understanding the perception of the academicians, international organizations, associations of innovation professionals and conference participants who attended the 8th European Conference on Innovation and Entrepreneurship, this study aims to reach a limited group of professionals from different cultures. Perspectives of participants also needs categorization through content analysis, in order to gain a broader understanding of the respondents.

Having the professional's opinion is a common approach especially used in cognitive studies, for instance; Cowan (2012) analyzed the perceptions of Human Resource professionals' perspective in order to understand workplace bullying. On the other hand, professional's perception may affect the public opinion, such as Cullen and Marshall (2006) underline the role of professionals on promoting the health information about genetic research. Therefore, in this case, the research mainly aims to understand the current perception of innovation.

5.2. Population and Sample

The population consists of 236 participants based on the responses of academicians, international organizations, innovation professionals and participants whom are chosen by using a snowball technique. As a starting point, authors communicated with attendees of the 8th European Conference on Innovation and Entrepreneurship in Brussels, Belgium, which they also attended. Among 236 participants, the number of respondents answering the questions is 31 innovation

professionals which represents 13.1 % of the population, from 12 responding countries as; United States of America, Canada, France, Spain, Turkey, Hungary, Belgium, Taiwan, Romania, Greece, Germany and Australia.

5.3. Method

A brief email is sent to all of the above mentioned participants explaining the fundamental purpose of the research and also addressing that the semi-structured questionnaire is prepared to apprehend the professionals' perception of innovation activities in the world for the next 25 years. Additionally, it is mentioned in the emails that the responses will only be used for academic purposes and analysis. As a restrictive effect, after sending the emails to the innovation related professionals twice, in some cases three times, 86.9 % of participants gave no response. It basically took two and a half months (from the beginning of April 2016 - until mid June 2016) to collect the necessary data from the respondents.

To analyze the semi structured questionnaire, content analysis is carried. Categories are not predetermined but constructed through the text. The context of the text is coded by the two authors separately and cross-checked as well. Frequencies and percentages are calculated via Excel. Afterwords, the emerged categorization is compared to the perspective suggested by Shaughnessy (2013). The model of Shaughnessy offers main classifications though the sub-categorization is not strictly defined. This adaptation offers a new taxonomy to evaluate the perception of innovation, since no study is carried for this issue specifically. Besides, in order to evaluate the effect of time, classification of Stone et al. (2008) is benefited.

5.4. Research Questions

Regarding the research questions, four principal questions about the future of innovation within the next 25 years are asked: thoughts of innovative efforts in near future, popular sectors that will be ahead of others, qualifications of human capital and threats for innovation, and also the demographic characteristics (gender, age group, higher education level, country of residences and occupational background). Questions are presented as follows;

1) How do you see the future of innovative activities in general in the world?
2) Which industrial developments or sectors will be more significant than the others? and why do you think that way?
3) What type of qualifications or capabilities of future human resources will matter more for the next 25 years compared to today's human capital skills?
4) What will be the biggest threats or constraints for the innovation activities or efforts in the near future?

6. Main Findings

6.1. Demographic Characteristics and Sample Structure

Table 1 represents demographic factors and sample structure of 31 respondents. Top three responding countries are respectively United States of America, Turkey and Taiwan which represent 53.6 % of the population.

Table 1. Demographic Characteristics and Sample Structure

Gender	Female	22.6%
	Male	77.4%
Age (Mean)	Overall	40
	Female	40.7
	Male	40.1
Education Background	PhD	41.9%
	PhD Candidate	6.4 %
	Master	29 %
	Bachelor	19.3%
	Tertiary	3.2%
Occupation	Academia	12.9%
	Finance (banking and investment)	9.6 %
	Educator	6.4 %
	Researcher	6.4 %
	Consultant	6.4 %
	Professor	6.4 %
	Psychologist (organizational and clinical)	6.4 %
	Insurance agent	6.4 %
	Student	6.4 %
	Specialist, Technology transfer office	3.2 %
	Sales specialist	3.2 %
	Entrepreneur and academician	3.2 %
	Research associate	3.2 %
	Engineer	3.2 %
	E-commerce	3.2 %
	University lecturer	3.2 %
	Phd candidate	3.2 %
	Corporate educator	3.2 %
	Manager, Hospital Strategy and Operational Analysis	3.2 %
Country of Residence	United States of America	25 %
	Turkey	17.9%
	Taiwan	10.7%
	Spain	7.1%
	Greece	7.1%
	Belgium	7.1%
	Romania	7.1%
	Canada	3.6%
	Germany	3.6%
	France	3.6%
	Australia	3.6%
	Hungary	3.6%

6.2. Future of Innovative Activities in the World

Table 2 and Table 3 represent the future of innovative efforts based on 31 responses. Positive expressions are grouped as: focus of innovation, innovative environment, property of innovation, result and purpose of innovation, triggers of

innovation. On the other hand, negative expressions are grouped as; negative outputs of innovation, obstacles for innovation.

Table 2. Positive perceptions about future of innovative activities in the world

Group	Expression	Frequency	% in group	% in question
Focus of innovation	Technology orientation	8	57	12
	Sustainability orientation	3	21	5
	Internet related innovations	2	14	3
	Education related innovations	1	7	2
Innovative environment	Human source dependence	3	30	5
	Culture of adhocracy	2	20	3
	Human-technology interaction	1	10	2
	Collaboration of UIGS	1	10	2
	Effect of work environment, development labs	1	10	2
	Co-creation	1	10	2
	Open innovation, crowded funding	1	10	2
Property of innovation	Gaining importance	14	61	21
	Country/region based expressions	3	13	5
	Complex and extraordinary	2	9	3
	Increase in number of innovations	2	9	3
	Globally connectedness	1	4	2
	Moderate	1	4	2
Purpose and result of innovation	Positive effect on society and government	2	29	3
	Increase in efficiency	2	29	3
	Necessary for market domination / be on market	2	29	3
	Increase in investment	1	14	2
Triggers of innovation	Need of differentiation	1	33	2
	Effect of natural sources on accessibility	1	33	2
	Emergence of individual innovators via social media	1	33	2

When the expressions are considered from the Shaughnessy's (2013) classification, although every expression is not necessarily be classified according to his model, new service infrastructure is a precise approach, indicated as "Technology orientation", "Internet related innovations". Besides the expression of "Necessary for market domination / be on market" clearly defines fluid core; "Need for differentiation" partially indicates radical adjacency; "Human source dependence", "Emergence of individual innovators via social media" indicate personal innovation drives; finally "Open innovation, crowded funding" and "Collaboration of UIGS" indicate externalization.

Based on the innovation perception of the respondents, a 42 year old male respondent from USA stated that *"Innovation activities are no longer enclosed in specific innovation hubs, like Silicon Valley, Tech Park in London, Dublin or Berlin. Individual innovators are now increasingly more visible through social media, able to*

access to fund their projects/ideas." which underlines the externalization and approach of personal innovation drivers.

Besides, according to Stone et al. (2008), expressions are related to the fourth phase as information, network and dynamism, but also expressions under the group of "innovative environment" and "triggers of innovation" can be considered as input of innovation (phase 1), while "purpose and result of innovation" can be considered as an output (phase two).

Table 3. Negative perceptions about future of innovative activities in the world

Group	Expression	Frequency	% in group	% in question
Negative outputs of innovation	Increasing unemployment	2	40	3
	Growing gap between regions	1	20	2
	Beneficial only for rich	1	20	2
	Negative effects on environment	1	20	2
Obstacles for innovation	Lack of fund, risk in investment	1	25	2
	Intellectual property right problems, their negative impact on open innovation	1	25	2
	Dependence on relationship with powerful countries	1	25	2
	Culture of conservatism	1	25	2

Perceived threats can not be categorized evidently by Shaughnessy's (2013) model. For the phases of Stone et al. (2008), inputs of innovation (phase one) as seen in "Lack of fund, risk in investment" and outputs of innovation (phase two) can also be categorized.

According to a 55 year old male respondent from Taiwan, the biggest problem will be cultural and conservatism is on the rise all over the world. He emphasized that *"Conservatism makes it difficult to be innovative. Much of the success of innovation depends on it's own success. If innovation continues to put people out of work, it's possible that there will be more push back against innovation."*

6.3. Significant Industries in Future

Table 4 shows the essential industries that will be ahead of others in the near future. Top five industries according to the responses are shown.

Table 4. Essential industries in the future

Industries	Frequency*	% of expressions
Medicine, health	13	14
Informatics, information technology	11	12
Technology	9	10
Green/renewable energy	7	8
Communication technology	6	6

*Expressions having frequency under (6); (4) each; Internet of Things, Electronics, Biotechnology, Tourism, (3) each; Education, Agriculture and Food, Logistics and Travel, (2) each; Genetics, Augmented Reality, Nanotechnology, Computer Sciences and Software Development, Service, Industry 4.0, Aerospace and Space, (1) each; 3D Printing, Cloud, Finance, Internet, Automotive, Disabled and elder focused technologies, Art and Design, Architecture. Total number of frequency is 93.

6.4. Qualifications of Human Capital Mattering the Most in Future

Table 5 presents the qualifications of future human resources based on the responses. Based on 31 responses, top five qualifications of future workforce are respectively; creativity, adaptability, continuous learning, education, labor and workplace flexibility.

Table 5: Qualifications of future workforce

Qualifications	Frequency*	% of expressions
Creativity	8	12
Adaptability	5	8
Continuous, lifelong learning, will to learn	5	8
Education	4	6
Labor and workplace flexibility	4	6
Deep understanding of multiple faces of reality, ability to see beyond current reality	2	3
Communication	2	3
Emotional intelligence	2	3
Ability to design	2	3

*Expressions having frequency (1); Level of imagination, Enthusiasm, Ability to question, Passion to find answers for future, Transversal skills, Professional ethics, Computer skills shaping R&D, Problem solving, Empathy, Autonomy, Self motivation, Critical thinking, Math skills, Multidisciplinary mindset, Personal touch, Cognitive ability, Social skills, Being intellectual, Risk taking propensity, Collaboration among workers, Understanding organizational culture by human resources, Being knowledge worker, Competence management, Engineering skill, Applying new skills regularly, Having internal locus of control, Servant, ethical and authentic leadership, Understanding technology versus training, Ability to coach, Ability to facilitate and train to better engage, Ability to know strategy, Diploma in related field. Total number of frequency is 66.

This question is mostly related to "personnel innovation drives" category of Shaughnessy (2013), and focused on intangible assets, information and network as an indication to Stone's (2008) fourth phase. Besides the emphasis on infrastructure (technology, internet, computer etc.) is indicated by a 43 year old male respondent from Romania as *"Educational model of future isn't an individual specialized in something but with deep understanding of everything, multiple faces of reality. Ability to use technology, adapt to speed of innovation in technology, critical thinking will be important."*. A 57 year old female respondent from Turkey also underlines the usage of technology as *"As we create more and more human distance with computerized services, we may come to value the ability to communicate more. Conversation and common sense may need to be rediscovered."*

6.5. Threats for Innovation in the Future

Table 6 states the threats for innovation in future based on 31 responses. Top four threats are respectively; finance, political issues, fear of change and power struggles, representing 44 % of expressions addressed by participants. Threats are also indicated in the first question and evaluated in Table 3 but under two main groups, here is the detailed list related to 'obstacles in innovation'.

Table 6. Threats for innovation in the near future

Groups	Expressions	Frequency*	Total Frequency
Cultural	Inertia, Lethargy of individuals	2	6
	Too much hierarchy and autocracy in organizations	1	
	Lack of creation and expression of ideas in organizations	1	
	Lack of flexibility in organizations	1	
	Lack of personal touch	1	
Economic	Funding, financing, budget, cost	7	11
	World economy, global shocks	2	
	Artificial intelligence related unemployment	1	
	Robotics and being out of work	1	
Political	Power struggle between corporations	1	11
	Terrorism	2	
	Wars	1	
	Politics, conflict between countries	3	
	Lack of consensus to implement RDI (research, development, innovation) policies	2	
	Short term strategic plans of organizations	1	
	Politicians	1	
Educational	Lack of good education	2	3
	Lack of training	1	
Psychological	Individual fear of change, unknown, failure	3	6
	Greed of human nature, corporations	3	
Sociological	Religion	2	5
	Isolation of communities	1	
	Innovation applied to a limited group/sector	2	
Ecological	Ecological and Environmental Disasters	2	2
Law	Intellectual property rights	2	3
	Acquisition of patents for organizational benefits	1	

As seen in Table 6, categorization of threats offers a wide range of areas in accordance with the literature. On the other hand, the expressions are recognized to be about intangible issues (fourth phase of Stone) and inputs such as monetary issues (phase one of Stone). Obviously, there is no recognized threat about new service infrastructure and radical adjacency. Some of the expressions related to conflicts, organizational management styles, short term focus etc. can also be categorized under "strategic options portfolio".

For instance, a 48 year old male respondent from Greece stated that *"Since innovation is risky, mortal, it's usually avoided by risk averse entities. The innovator has to learn from mistakes in a competitive environment, and lose some capital. There may not be available funding, especially for start-ups. Inadequate legislation about intellectual property rights can harm innovation."* A 64 year old male respondent from USA believed that *"The biggest threat in companies is the short term focus combined with a desire to call every little change an innovation. Innovation is most often very hard, and it takes time to produce the results."*

7. Assessment of Findings

In light of the demographic factors and sample structure, vast majority of the respondents is male. Average age of both gender is 40 and it is assumed that they have good experience in their field of study. In educational backgrounds, 42 % of the respondents have a PhD degree followed by 29 % of Master degree. Thus, their opinions about the matter of innovation will be significant in comprehending innovative efforts, since they are coming from various occupations such as educator, researcher, finance in banking and investment and consultancy. Although 12 countries take place in this research, top three responding countries are respectively United States of America, Turkey and Taiwan which represent 53.6 % of the respondents.

7.1. Expectations about Future of Innovation

The future of innovation is evaluated under different perspectives mainly in two; positive and negative. Amongst positive expressions there are five groups as: focus of innovation, innovative environment, property of innovation, purpose and result of innovation, triggers of innovation. Each group approaches the future of innovation from various perspectives. The common point is that all the expressions within the groups are in positive meaning.

On the other hand, negative expressions can be categorized into two groups as; outputs and obstacles. Obstacles for innovations indicate the areas open to improvisation to create a more innovative environment. Negative outputs indicate the results of innovation from the dark side. Expressions about growing regional gap and benefits only for rich, demonstrate the inequity in the distribution of innovation outputs.

Environmental issues are referred both in the negative and positive expressions. Positive approach defines it as a significant industry which is open for innovation, and the negative approach categorizes it as an area affected negatively by innovation. This underlines the necessity for environmental friendly innovations and innovations to reduce the damage on environment.

7.2. Industries Expected to Become Prominent

Significant industries subject to innovation are various and the most frequently mentioned expression is health and medicine. The expressions of biotechnology and genetics can also be related to this sector. Secondarily, technology and equipment related expressions such as Information Technology, Communication, Internet of Things (IoT), Electronics, Augmented reality, Industry 4.0, 3D Printing, Cloud, Internet, Automotive are also dominant in overall. Education is also taking on a new significance, as OECD (2014) also searches for innovative teachers or new pedagogical approaches in European countries.

When compared to the report of Thomson Reuters (2016), sectors having high growth in innovative activities between 2009 and 2015 are classified as food, beverage and tobacco, aerospace, home appliances (internet of things), medical devices, oil and gas, information technology, automotive, pharmaceuticals, telecommunications, cosmetics and wellbeing, biotechnology and semiconductors respectively. As there are similarities between the perceptions of participants and the statistical results, it is remarkable that category of food and beverage and tobacco is not evaluated by participants to be subject of innovation. OECD (2011) also defines the most innovative

sectors as R&D, chemicals and chemical products, insurance and pension funding, refined petroleum products and so on respectively, based on 2004 and 2006 data of Eurostat.

7.3. Expected Change in Human Resource Qualifications

More than half of the respondents believed that being creative, ability to create new ideas, and products, adaptability to hectic business environment or various circumstances, being able to develop yourself through lifelong learning, improving your education, demanding to learn and being open-minded, will be some of the top abilities or specifications that the potential workforce or human capital will hold in the near future and the workforce holding those abilities will be a step ahead of the others who lack these pivotal competences. Moreover, as Lee and Yu (2013) highlighted that digital business skills, agile thinking, communication skills as co-creativity and brainstorming skills and global operating skills will also be significant in the near future.

7.4. Expected Threats in Future of Innovation

Threats are classified under various groups; some can be detailed through current academic studies. For instance, intellectual property rights are discussed under open innovation (Schultz and Urban, 2012), funding issues are debated under crowdfunding (Millick and Robb, 2016), technological innovation resulting in unemployment discussed for technologically improved firms (Feldmann, 2013). Though some issues addressed by the professional needs more attention; such as the relationship of innovation and religion or innovation applying to a limited group/sector which may result in social stratification.

While doing business with other organizations in tough conditions, a couple factors are expressed as threats. Firstly, although financing/funding can be seen as a weakness of the organization, the respondents believe that poor financing and funding is a threat to survival of firm and it is seen as a critical aspect of their doing business. Lack of good relations between countries and application of inefficient research, development, lack of innovation policies are also mentioned as the biggest threat of the future in performing innovation efforts. Fearing of change and unknown, power struggles between corporations and terrorism are also emphasized as threat (e.g. People fearing that innovation may cost a lot or that it will not work.) Forming a business environment that supports change and creativity along with consistent policies within corporations and among countries will reduce the threat level.

According to Dixon (2011), as seen in the recent global economic fluctuations, consumer trust is really essential. Emotional reactions to events are often far more pivotal than the events themselves because emotions can alter very fast. So, the author criticizes inefficiency of the market research and underlines the necessity of a deeper look explaining the uncertainty and vulnerability people live in.

8. Conclusion and Recommendations

The primary purpose of the study is to analyze and comprehend the future perception of innovation by the academicians, international organizations, innovation professionals, and innovation subjected international conference participants. Amongst 31 professionals that participated in this study, 41.9 % having PhD degree and composed of 12 different countries, there are several perceptions about the future of

innovation. As the result of the analysis show, some concerns are recognized to be accumulated under common topics, and the results are compared and classified according to previous researches.

A precise contribution of this article is the categorization of professional perception about the future of innovation; including positive and negative perceptions, threats, related industries and workforce qualifications. There are critical evaluations of professionals, such as dehumanization of technological innovation, leading to stratification in the society as only a limited group facilitates the innovation, which actually underlines the gap in literature. Moreover, categorizing the perspective of innovation, not surprisingly, does not fit the previous theoretical explanations, as seen in the comparison with the approaches of Shaughnessy (2013) and Stone et al. (2008). In addition, some of the views of participants such as will to learn, creativity, deep comprehension of reality and emotional intelligence are partially related with intangible resources stated in the fourth phase of Stone et al. (2008), though the last phase does not completely cover the perception of professionals. This differentiation results in offering a new taxonomical explanation of future of innovation through this study.

Results indicate a general overview of the future of innovation, the opportunities and threats. As accepted by authorities, innovation is considered as a critically essential social and economic phenomenon worthy of research study. Fagerberg et al. (2013) express the conflicts of socio-economic issues as the firms are concerned about their innovation capability because they believe that their future may depend on it. Politicians also care about innovation because of its importance for growth, welfare and employment. However, to realize that innovation is desirable because of its benefits isn't recognized to be enough in itself so the systematic and reliable knowledge about how best to affect innovation is assumed to be necessary by Fagerberg and colleagues.

Taking into account the influence of policies and regulations on business models, the design of public policies supporting innovation should explore how to take account of new business models for strengthening the innovation capacity of organizations (OECD, 2012). To sustain the pace of innovation, organizations need to progress their capability to produce, integrate and recombine knowledge (Leonard-Barton, 1995) and strategies are needed for finding new boundaries and potentially new innovations (Hrastinski et al., 2010; Powell et al., 1996).

However, according to Frey and Osborne (2015), digital age and robotics may be more disruptive than previous revolutions as it is happening faster and is fundamentally changing the way we live and work. For instance, industrial robots have substituted for manufacturing workers for the past thirty years. Through robotics, big data, the digitisation of industries and the Internet of Things (GP Bullhound Report, 2016), the nature of occupations and whole industries is altering.

On the other hand, human resources is another critical issue to be discussed; the robots and droids which are offered as a simulation of human find a wide range of application areas. When the technological development is considered, internet of things, industry 4.0 applications underline the generosity of application areas of robots. The internet of things and industry 4.0, which are also mentioned by the participants, is perceived to be easing the work but also threatening the employment. This concern is underlined by McAfee (2013) and Rendell (n.d.) who is the Global Human Resources

Consulting Leader of PWC and explained as the blended boundaries of human and technology.

However, due to the significance of the future role of human resources, Dixon (2011) emphasized that the future is being shaped by technology or innovation, but will be driven by emotions and emotions dictate how customers feel, how they want to live, what concerns they have and what actually excites them. For this reason, apparently there has to be a deeper look in innovation efforts for the future. This research sheds a light on future innovation studies for academicians, practitioners and researchers.

9. Limitations and Future Studies

First of all, it is an exploratory and qualitative research trying to comprehend and analyze the perception of innovation professionals, innovation related associations and academicians. Due to the nature of the study, difficulty in gathering data, limited number of responses and limited reachable countries of only 12, the sample size consists of only 31 respondents and face to face interviews can not be performed due to the location of respondents. The research gives a certain point of view of international perspective of innovation professionals but generalizing the findings and categorization of perceptions according to country are very difficult due to the nature of the sample size.

For future studies, empirical research can be performed by considering indicators in innovation and entrepreneurship indices or focus groups can be formed in innovation related centers. Specifically for an association dealing with innovation activities or focusing on product innovation, service innovation, process innovation and organizational innovation separately bring several perspectives to the subject of innovation. By considering specific sectoral differences, focusing on future industries such as tourism and hospitality, information technology or advanced manufacturing that will shape the global business environment, can also be analyzed and evaluated through professionals, surveys or focus groups. Due to the limited number of participants, perspectives of them are not evaluated and compared based on the countries. Along with the increased number of participants, country differences can be analyzed in much more detail for further research. In addition, a meta analysis can be performed from other innovation studies to enrich and strengthen the current arguments of innovation.

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APPENDIX

Questionnaire

Dear Participant,

The questionnaire is prepared to apprehend the professionals' perception of innovation activities, industrial developments, human capital competences and threats for innovation efforts in the world **for the next 25 years**. The answers will only be used for an academic research about the international perception of innovation. The answers will not be used in another study and the information for your identity is not required. If you have any questions, please do not hesitate to contact us.

Thank you very much for your time and participation.

Sincerely.

Research Questions

Demographic Characteristics

1. Your gender? Female or Male

2. Your age?

3. Your educational background? PhD, PhD Candidate Master, Undergraduate or Others

4. Your country of residence?

5. Your occupation or professional interest?

Innovation Look

6. How do you see the future of innovative activities in general in the world?

Industry Significance

7. Which industrial developments or sectors will be more significant than the others? and why do you think that way?

Future Qualifications

8. What type of qualifications or capabilities of future human resources will matter more for the next 25 years compared to today's human capital skills?

Threats for innovation

9. What will be the biggest threats or constraints for the innovation activities or efforts in the near future?