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# Open Innovation Association with Feeling Economy

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**Abstract.** Innovation and technology have always worked together to accelerate human evolution and society’s development. However, emerging technologies including Artificial Intelligence (AI), Collaborative Networks (CN), Innovation Platform, automation, etc., leapfrogged this process to a new level. Through AI, Machines perform tasks related to recognition and control better than human. On the other hand, in near future “thinking”-based skills will not guarantee employment and wage creation, however, considering machine lack in automating human feeling, the feeling related skills which are “soft” aspects of job could define human tasks. Current review paper aims to study the association of Open Innovation (OI) Platform as a type of CNs with Feeling Economy as a future trend of emerging economy. In view of importance of collaborative and innovative network’s role in smooth and sustainable transition from a thinking-based economy to an emotion-based economy, this work provides a clear understanding of OI and Feeling economy concepts and their inline transition and requirements based on a systematic review.

**Keywords:** Open Innovation · Feeling Economy · Creativity · Soft Skills · Artificial Intelligence · Collaborative Networks · Human-Centered.

## 1 Introduction

The increasing complexity and dynamism of markets, growing availability of private venture capital, number of knowledge workers and their mobility level and technology development has pushed business owners to accept the consequences of adapting a new paradigm which was opposed to their closed and private traditional research labs [1,2].

Businesses that use high-tech AI-based solutions in their life cycle, get courage to open their doors to the flow of knowledge, innovations and ideas to survive and create competitive advantage. By accessing to the internal data of the business, AI empowered OI solutions provide better understanding of its business issues, weaknesses, and strengths. By gathering and analyzing external data and resources, they provide optimal solutions and possible opportunity for business challenges.

Despite the role of technology in improving business, its impact on jobs cannot be ignored. There are three perspectives to the impact of technology on employment rate:

- Doomsayer's perspective considers technology as a factor to improve efficiency in human labour by tasks automation [3].
- Optimist's perspective, suggests that many types of labour may be replaced by technology, but the benefit and efficiency that achieve from technological empowerment outweigh transition costs [4,5].
- It indicates, by developing automated technologies, workers may require more social skills, as automating this type of skills is hard [6]. Unifying Perspective, suggests that multiple assets will accompany technological changes and create uncertainty about future works [7] and technology directly will influence the demands for special skills [8,9], therefore, it results in increasing demands in jobs, which typically require non-repetitive and soft skills and as a consequence rising salary in related jobs [10].

Each of these different perspectives motivate changes in current economic trends and skills requirement for human resources to have a successful career in near future. However, accuracy of a forecast is highly depending on accurate understanding of past and present situations and most commonly by analysing the trends. Facing the need for future transformation processes worldwide regarding to changes on the job nature and emergent skills, the challenges for labour productivity, employment and mobility, the quality and new forms of work, and how technology can help to create this ambitious and human feelings centered environment, requires huge studies and research [11–13].

The present systematic review paper aims to study the role of OI in association and accelerating the economy of feeling as a possible future trend for economy. The main novelty is that the paper assesses and validates the analysis outcomes and propositions of previous works regarding the relation between OI and feeling economy with a look at skills needs necessary for the new job content in emerging era. This will trace the baseline to understand, analyze and discuss the soft skill factors that can have a direct influence in the OI platform success and also the impact of OI in moving toward more feeling oriented working environment. At the end of this paper a set of recommendations will be elaborated to guide the further development of the work.

## 2 Methodology

### 2.1 Objectives and Research Questions

This section will provide a clear understanding of the research trends in relationship between soft skills and OI in the world of smart industry and digitization. The Systematic Review Methodology is used as a baseline to structure my work. Interested readers can have a detailed description of such methodology at [14,15].

A summary of the objectives of this research paper can be described in the following research questions:

1. Does OI based CNs has relationship with feeling economy trend?
2. What are the current trends and deviations in relation between soft skills and OI?
3. What will be the future trends for soft skills' necessity in OI based on paper review?

Following section will describe the methodology used to fulfill the objectives of this paper to answer the questions.

## **2.2 Methodology**

For the search and selection of the adequate articles, Scopus database was used. It is one of the most well-known and large academic article databases. Various terms were used recursively and combined to conduct literature review part. However, the most important and final terms are composed of keywords "Open Innovation" and "soft skill" and "Feeling Economy" without any further criteria on all fields.

Totally 172 papers have been suggested by the Scopus database which have been refined in different steps as are shown in Fig. 1 and reached to 71 relevant papers.

## **3 Open Innovation and Necessity of Soft Skills' Presence**

In the past decades, innovation and creativity illustrated a critical role in the successful performance of organizations in the long and short term. It acts as an influential tactic for organizations to obtain competitive advantages by inventing new products, services and processes to underserved or unserved customers [16].

Previous researches show that innovations and CNs create added value for involved partners by lowering the costs of services or existing products, improving their quality, introducing innovative products or services which there is enough demand in the target market, or delivering improved business models [17,18].

Furthermore, it has been observed that extreme innovations transform, destroy or create new markets by introducing new solutions to existing challenges. Therefore, researchers are interested in addressing innovation and innovation flows as a key factor on companies' financial success and markets economy [19, 20]. It has been considered as an effective remedy for difficult and complicated global situations such as Covid-19 pandemic [21,22].

The emphasis on openness of knowledge and innovation flows within and outside the companies' boundaries has played a key role to the evolution of OI and generation of novel methods of collaboration networks [1,23]. OI indicates, companies demand innovation and knowledge flows whether inside or outside their boundaries to empower flow of innovation, while at the same time looking for external markets and partners to commercialize their internal knowledge

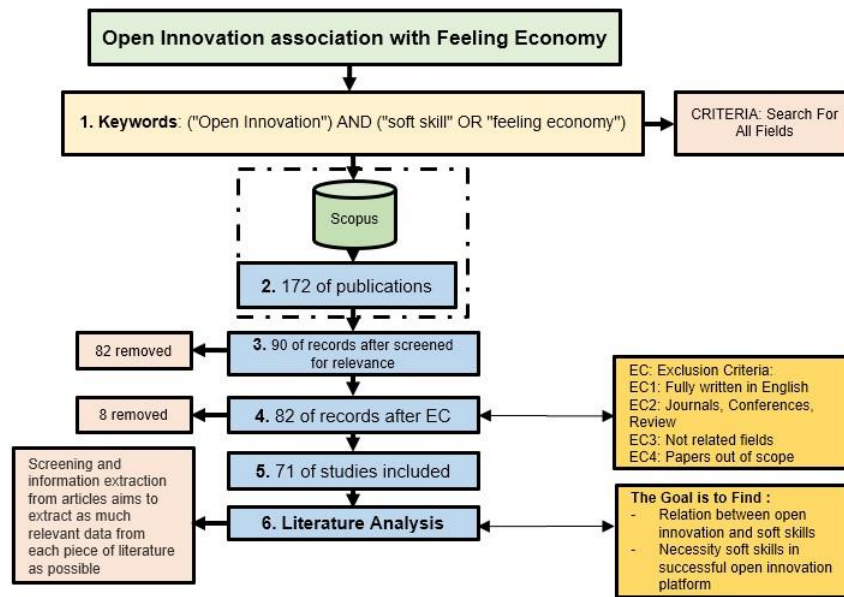


Fig.1: Systematic Review Methodology, from [14,15]

assets, technologies and innovation [24]. OI also results in an uneven growth in productivity and prosperity which has direct impact on economy [25]. OI aids in a shift to produce greater openness for knowledge and innovation sharing. This process occurs from the inside to the outside of the company and vice versa [1]. Wide-spread collaboration and communication networking are critical factors of this platform.

Based on reviewed papers [26], effective performance in OI platform demands high efficiency of communication, leadership, collaboration, Critical thinking and Flexibility and Agility. Simultaneously, significant required soft skills in OI platform can be summarised as below:

- Collaboration
- Leadership
- Communication
- Flexibility and Agility
- Critical thinking

Soft skills are essential to empower the smooth outflows and inflows among various sectors inside and outside the companies' boundaries [27–30]. Employees' soft skills have become critical factor in evaluating their value to a company [31]. Companies are looking for new training and recruitment methods to increase their employees' soft skills alongside the hard skills to guaranty their successful performance in OI [32,33]. In next section we will dig more in the added value of soft skills and the new era of economy based on feeling.

#### 4 Economy Based on Feeling

Contemporary industry is facing dramatic changes. It is experiencing different way of producing products, providing services, business processes, and chain management [34,35] alongside the changes in required skills and training for the workforce [36]. Based on world economic world 50 percent of employees will need reskilling by 2025, 40 percent of skills are expected to change in the next 5 year [37].

New digital technologies such as AI, machine learning and internet of things are affecting the nature of work spaces and jobs [38]. Related studies have proved the important role of tasks automation on workforce and companies across Europe showing that automation will affect 35 percent of employment in Finland [3] 59 percent of employment in Germany [12] in near future. New jobs are likely to be focused on the non-routine and emotive tasks which require higher-order of soft skills which are less probable to be automated in near future [39,40]. Furthermore, some experimental evidence demonstrates that, even though availability of information is crucial to make an analytical decision, people tend to make the decision based on their feelings [39,41,42].

This also leads to higher demand for jobs that are more difficult to automate and need high quality of soft skills like communication, collaboration, empathy and critical thinking that are essential elements of toady's successful business nature [43,44,37]. Therefore, the most important skills of the new work force are not just technical skills anymore, but also emotive and interpersonal ones, which highlight the need of an economy based on feelings [45]. This is an economy in which the emotive tasks are the essential tasks and employment with higher soft skills are more likely to receive more wages comparing the total employment and wages attributable to thinking or mechanical tasks [46,40].

Many researches show that Industry has become more feeling oriented in the past years and it is a sustainable process. The Fig 2 represents the researches within 2012 till 2022 years from Scopus for keywords "soft skill" or "emotive skill". As it illustrates, the "Business, Management and Accounting" area represents the second highest number of publications by field, which shows the significant role of soft skills in this area.

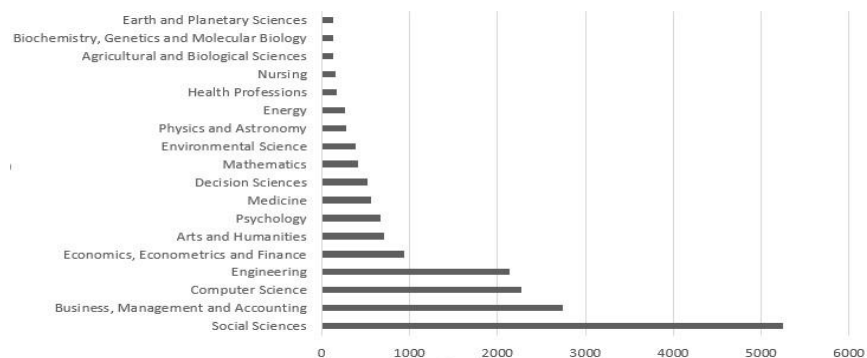


Fig.2. Research Trends toward the importance of "soft skill" in "Business" area.

Openness of innovation and knowledge flows happens when the required tools with the necessary skills are presented, in the next section we will discuss feeling economy and OI association and convergence.

## 5 Results and Discussion

In recent years, OI research has advanced on different aspects. The studies that focus on multiple perspective of influential factors on OI provide valuable insights on a whole range of essential required factors that shape OI processes flow which result in a platform of innovations in collaborative and interactive network [47].

Earlier we asked about Feeling economy and OI association and discussed their significant features. The Fig. 3 illustrates the OI and feeling economy inline interactions.

OI needs to fulfill essential factors to accelerate the outflow and inflow of innovation. One of the required factors is soft skills [45,48]. At the same time smart industry tends to delegate more thinking and repetitive tasks to new technologies which provide even more space for human workforce to focus on what is their advantages, soft skills. Emerges of soft skills, create an environment which people are well-trained or eager to educate in emotive skills, and they can communicate and collaborate in productive way in CNs.

OI by providing an innovative environment alongside the open exchange of knowledge beyond company boundaries and proactive networking provide a high potential environment for human soft skills to be expressed and trained. OI association with feeling economy provides a proactive platform for industries successful growth and establishment.

New era is emerging, era of feeling economy and the recent advancements in smart industry along the companies' needs to establish a concrete network whether inside or outside their boundaries in order to be successful in globalization markets [49]. Although, innovative technologies and tools are making it easier and more convenient, this cannot be achieved without the presence of soft skills [50].



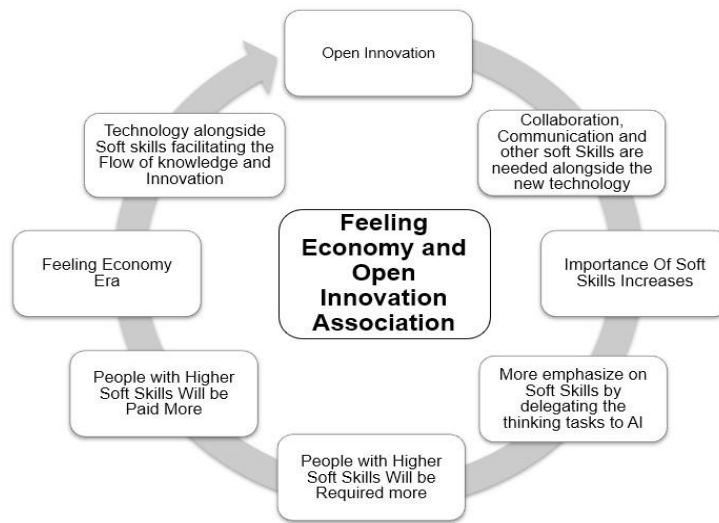


Fig.3. OI and Feeling economy association.

## 6 Conclusion

Current research has critically analyzed association of OI with Feeling Economy and importance of soft skills in near future and in future industrial revolution (Industry 5.0). However, emerging technologies like AI and machine learning may help us in accelerating and improving thinking tasks, but they are still straggling support human societies and work place in emotive and creative related tasks as good as human beings which lead us to the new economical trend which is based on human feeling.

This study highlighted that successful launch and maintenance of innovative networking platform like OI is in high association with soft skills. By showing the future trends, it illustrates the path, required skills and education for innovative CNs. This study showed the trends toward more emotive networking by the usage of smart industry tools therefore it enables the companies to plan with clearer vision to train their workforce, change their business vision and recruitment strategies and be ready to tackle the changes of emerging era of Feeling Innovative CNs to perform successfully in near future.

The results of this research put light on a deep research gap which could be addressed in future studies, including, developing knowledge, tools, methodologies and technologies which future workforce could apply to develop their skills and position in Feeling economy-based societies and Industry 5.0. Also, according to the finding of this study, there is a high expectation that future innovative ecosystems and business developments will be based on CNs particularly OI, which lead to the conclusion that current and future businesses require more attention in this type of platforms and networks to guarantee their business sustainability alongside the feeling skills which are the foundation of OIs ecosystem. However, there should be more in-depth study

regarding the characteristic of feeling oriented working process and Feeling oriented innovation process to provide better understanding of the emerging new era of feeling and openness.

It is important to have a better understanding regarding the different aspects of CNs and OI, the skills required for working in such an environment, technologies that could help us to facilitate our communication such as affective computing or computational creativity, methodologies and assessment tools, regulation, ethics and data privacy, etc. Due to the reality that women traditionally considered as humans which has better soft skills, a question will be raised based on this study is, how gender equality could play a role in an economy which is based on feeling, and what will be association between these two.

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