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Special Issue Papers from 8 Keynote Speakers

1.

Science, technology, leisure, and fear: A story of interconnections

Fred Philips(University of New Mexico)

Abstract

It is well known that technological change causes social change, and vice versa. This talk examines that truth at a finer level of specificity, namely, that social perceptions of interconnectedness influence the progress of science and technology, and that conversely, as 21st-century technology makes us in fact more connected, society's attitudes shift. From the S&T side, we will look at interdisciplinary research, system and complexity theory, quantum tech, and the Internet, exploring how these interact and cause changes in social attitudes – fears, conspiracy theories, political polarization, and even entertainment trends – some of which are surprising, and some dangerous.

2.

Alternative Failures and a Success for Planning Green Urban Settlements

Philip Cooke(Bergen University College, Norway)

Abstract

This paper compares and contrasts three disruptive models of potential and actual new kinds of spatial planning. These include 'seasteading', 'smart neighbourhoods' and 'renewable spatial systems'. Each is labelled with distinctive discursive titles, respectively: 'Attention Capitalism'; 'Surveillance Capitalism' and 'Sustainable Capitalism' denoting the different lineaments of each, although they all have their origins in the Silicon Valley techno- entrepreneurial milieu. In each case, while the path dependences of trajectories have diverged the progenitors were often erstwhile business partners at the outset. The paper is interested in qualitative methodology and proposes 'pattern recognition' as a means to disclose the deep psychological, sociological, political and economic levels that inform the surface appearances and functions of the diverse spatial planning modes and designs that have been advanced or inferred from empirically observable initiator practice. 'Dark Triad' analysis is entailed in actualising psychological deep structures. Each of the three models is discussed and the lineaments of their initiators' ideas is disclosed. Each 'school' has a designated mentor(s), respectively: academic B. J. Fogg and venture capitalist Peter Thiel for 'Attention Capitalism'; 'smart city planner' Dan Doctoroff for 'Surveillance Capitalism' and 'renewable energineer' Elon Musk for 'Sustainable Capitalism' the eventual winner of this existential 'dark versus light triad' urban planning contest.

3.

The Growth of Knowledge and Its Limitations

Ulrich Witt

Max Planck Institute of Economics, Jena, Germany

Abstract

The growth of productive knowledge based on ever new scientific, technological, and organizational insights has been a main factor enabling and driving the transformation and the growth of economies worldwide. While newly industrializing economies can benefit from tapping already existing productive knowledge in their catching-up process, advanced economies need to generate ever new productive knowledge for supporting their economic growth. This requires resource inputs and the question arises whether ever larger inputs are necessary to maintain a continued growth of productive knowledge. Originally raised in relation to the productivity of "big science" by De Solla Price (1963), the question of a decreasing productivity in the generation of new knowledge is now discussed more generally together with its far reaching implications for future economic growth.

The present paper relates to this discussion. It will be explained in what way the technological conditions of knowledge processing matter for the generation of new knowledge and how these conditions have changed, and can be expected to continue to change, systematically with the growth of knowledge. A comparison with the evolution of genetic information – the analogue to productive knowledge in nature – is used to illustrate this point. A short digression into the epistemic problems of knowledge measurement reveals that the critical concomitant of the growth of productive knowledge is its increasing variety. It will be argued that it is this variety growth that alters the technological conditions of generating new knowledge such that the productivity of resources going into knowledge production is successively reduced. Finally, it will be explored what options policy making may have to avoid, or at least reduce, the likely negative effects of a decreasing productivity in knowledge generation on future economic growth.

4.

From Catching-up to Convergence of the Latecomer Firms: Evidence from the Korean firm data

Keun Lee

(Seoul national University)

This paper examines a hypothesis that the catching up firms from latecomer countries may converge to advanced firms when there is an improvement of their technological capabilities and/or corporate governance over time. Comparing the behavior and performance of the Korean firms during the 1990s and the 2000s and 2010s, this paper finds some evidences of convergence, such that Korean firms become more profitibility-oriented than growth-oriented, borrowing and investing less and thus less indebted, whereas they have not changed much in terms of their behavor about firm values and dividends tendencies. Further analysis using the patent-derived variables also confirms some aspects of covergence, compared to the early resuts in Lee (2013: ch. 5), that self-citations become significant and positive for firm values, whereas cycle time of technology variable become insiginficant for profitability, which is consistent with the results from the US firms. In the meantime, changes in corporate governance associated with the rise of foreign shareholder are also shown to have resulted in higher profitability but insignificant change in firm values.

5.

The comedy of commons: Democratization, Participation, and OI with sustainability -Comparative analysis of 3 economies: Jeju Korea, Sorento or Amalpi Italy, and St. Pertersburg Russia

JinHyo Joseph Yun(Research Director, Corr.)

1. Introduction

The venture ecosystems which are treated as successful examples such as Silicon Valley in US, JungKwan Chon in China, Cambridge area in UK et al., have similar characteristics. The members of successful venture ecosystem or regional innovation system treat new technologies, business models, or patents as a kind of commons, and agents in the systems communicate each other with democratic, and mutual participant ways, and arrive at creative open innovations. In addition, platform firms such as Uber, Airbnb etc. which are based on two-side network effects of sharing economy or social economy, that are a kind of common goods, let us think about not the tragedy of common but the comedy of common.

Are there any common or non-common success conditions and factors which can be applied to produce common goods in different economy conditions economy?

If then, what are they?

2. Literature reviews and research framework

2.1. Literature reviews

There are a lot of examples of common goods in capitalist economy for long time from Alpine Switzerland, Traditional common lands Iriaichi in Japan, to Huerta irrigating farm of in Spain (McC, 1972; McKean & Cox, 1982; Robert McC Netting, 1996; R. M. J. B. Netting & resource, 1982; Ostrom, 1990). The theories of collective action, and the commons that developed in the middle of the twentieth century emphasized the difficulty of collective action, and suggested that overexploitation of shard natural resources inevitable(Poteete,

Janssen, & Ostrom, 2010; Sandler, 1992). The tragedy of the commons deals explicitly with the challenges of avoiding overexploitation and degradation of a shared natural resources from Hardin's logic to deep-sea fisheries(Gordon, 1954; Hardin, 1968; Scott, 1955).

But, in the specialized conditions such as enough common goods, non-central control, or enough participants of related agents etc., common goods can be new clues as the comedy of commons according to cases from USA, Japan, and Switzerland (Ostrom, 1990). In fact, helping and supporting each other in the history of human has been contributed for the evolution of social institutions and the culture of mankind(Kropotkin, 1914). According to recent researches such as humans' helping each other in a repeated prisoner's dilemma game, and the coevolution of parochial altruism and war in human history etc., human can have the possibilities to use common goods for now usage and future together without the tragedy of common(J.-K. Choi, 2009; J.-K. Choi & Bowles, 2007; J.-K. J. J. o. E. B. Choi & Organization, 2007).

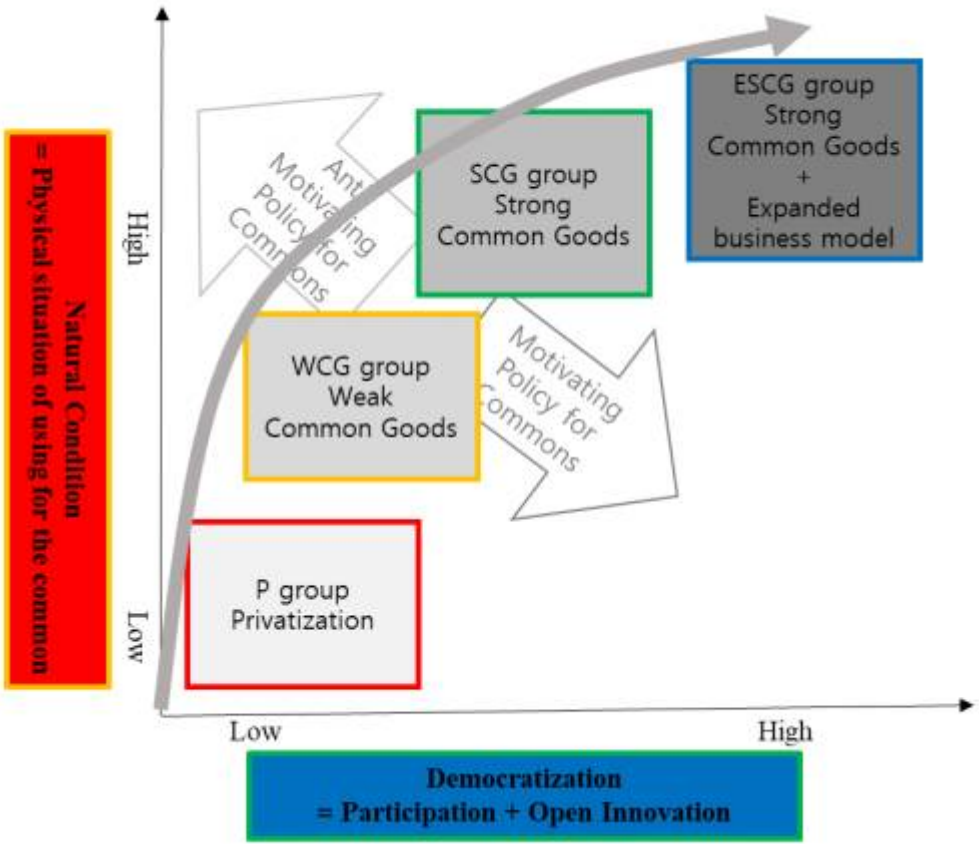

Figure 2. Research framework; diverse evolution direction of common goods

The directions of commons goods can have several candidates such as; Privatization; Maintaining weak common goods; Maintaining strong common goods; or Maintaining strong common goods and expanding business models (Figure 2) according to several cases; common good meadow and forest of Japan, and Switzerland; watering institutions and systems of Huerta areas, Spain; watering community of Ilocanos, Philippine; the logic of the water-right game of Metropolitan water district case of USA. etc.(Coward, 1985; Maass & Anderson, 1978; McKean & Cox, 1982; Robert M Netting & Netting, 1981; Ostrom, 1990, p. 202).

<Reference>

Berkes, F. J. M. p. (1986). Local-level management and the commons problem: A comparative study of Turkish

coastal fisheries. 10(3), 215-229.

Blomquist, W. (1989). The performance of groundwater management: volume 8, the Mojave River Basin. Paper

presented at the Workshop in Political Theory and Policy Analysis. Bloomington: Indiana University. Bowles, S., Edwards, R., & Roosevelt, F. (2005). Understanding capitalism: Harper Collins New York.

Choi, J.-K. (2009). The Appearance of Altruistic Human: PURIWA IPARI(In Korean Language).

Choi, J.-K., & Bowles, S. J. s. (2007). The coevolution of parochial altruism and war. 318(5850), 636-640.

Choi, J.-K. J. J. o. E. B., & Organization. (2007). Trembles may support cooperation in a repeated prisoner's dilemma game. 63(3), 384-393.

Choi, P. K. J. J. o. O. I. T., Market,, & Complexity. (2020). A Need for Co-Evolution between Technological Innovations and Social Innovations. 6(3), 54.

Coward, E. W. J. P. p. f. s. v. i. r. d. (1985). Technical and social change in currently irrigated regions: rules, roles and rehabilitation. 27-51.

Fusco Girard, L. J. S. (2013). Toward a smart sustainable development of port cities/areas:

6.

Identifying the Diverse Effecteds of Innovation from Natural Experiments

KwangHo Jung (Seoul National University)

7

Crisis-resilience of enterprises and overcoming the negative consequences of COVID-19.

Natalija Lace (Riga Technological University)

8.

The Digital Revolution in Innovation and Entrepreneurship – introduction of a conceptual framework for the impact of artificial intelligence on innovation and entrepreneurship

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Artificial Intelligence is an emerging technology with an immense transformative potential. Before this background, we discuss how artificial intelligence is transforming innovation and entrepreneurship in different ways. We develop a conceptual framework where we argue for two different roles of AI: as an originator, and as a facilitator. We outline applications and implications for innovation and entrepreneurship. Finally, we discuss future research directions in these fields.

Artificial Intelligence, Emerging Technology, Innovation, Entrepreneurship These days nobody would doubt anymore that Artificial Intelligence (AI) will become a key technology of the 21st century. A simple search in Google Scholar gives already more than three million results,

which underlines the growing research interest in this subject. Hence, it is not surprising that AI companies are in the focus of investors worldwide. In particular, AI related startups attracted over $40 billion in 20191 globally already. It is not surprising that during the last decade, both private and

government-lead programs have exponentially increased their investments in this technology. The generative and mutable characteristics of AI has enabled the rapid identification of potential applications by entrepreneurs and innovators alike. While the hype around the technology is not new (Meinhart, 1966)2, it is now that digitization is increasingly driving these potentials into a new

dimension in digital transformation (Lichtenthaler, 2020).

Beyond the exciting development of AI as a technology, the question that remains open is how AI will transform entrepreneurship and innovation at different levels. Recent contributions by scholars suggest that it has the potential to change how entrepreneurs make decisions (Townsend and Hunt, 2019), how we generate ideas and design new products and services (Kakatkar, Bilgram and Füller, 2020; Verganti, Vendraminelli and Iansiti, 2020), or how we engage with users leveraging available

data (Gregory et al., 2020) among others. We would like to propose to organize this prior findings in relation to the entrepreneurship and innovation processes (Brem, 2011), identifying how potential applications of AI technology resonate with the specific challenges of entrepreneurs and innovators.

Within our conceptual framework we argue that there are two different enabling functions of the AI technology, and that they matter (in different ways) how we explore the impact of the technology in innovation and entrepreneurship. They are the originator and facilitator functions. The originator function builds upon the AI as mitigator of perceived uncertainty, reducing the perceived complexity that the decision-maker faces. It powers the capacity of an individual to explore a massive array of possible solutions and provides certainty in unknown contexts (Townsend and Hunt, 2019). This function combines the generative and creative potential of AI, going beyond Machine Learning (ML) capabilities, to explore its intelligent sensing capabilities. As a result, this function is particularly fitting in the early stages of the entrepreneurial process, where the entrepreneur struggles to find possible solutions to identified problems, or is lost in the search for the product-market fit.

The facilitator function builds instead on the enabling capacity of AI to integrate and combine data in new ways. Much of this function relies on the ML advances that we have seen in the last years (Dinov, 2018). The facilitator function relies on the ability of using AI to learn about opportunities to improve the processes that drive innovation (Balasubramanian, Ye and Xu, 2020) also in known corporate structures like the well-known Stage Gate process (Cooper, 2014). Instead of creating a new organization or new busines model, the facilitator function e.g. helps to redesign how we identify and interact with lead users (Brem and Bilgram 2015; Kakatkar, Bilgram and Füller, 2020), or helps us to learn about what changes should we introduce in our services to make them more successful (Verganti, Vendraminelli and Iansiti, 2020). This function thrives with data, so the more data we can access the more valuable will be the application of AI. The rapid growth and expansion of the tech giants has provided sustained evidence on how data becomes the fuel that drives the facilitator function (Gregory et al., 2020).

While most of the attention will remain on how much funds AI startups are rising3, we would like to

encourage with this framework also further research to look beyond the surface. There are multiple opportunities to find approaches to understand how entrepreneurs and innovators are leveraging the power of the technology to transform how new ventures are created and innovative organizations are managed.

Balasubramanian, N., Ye, Y. and Xu, M. (2020) 'Substituting Human Decision-Making with Machine

Learning: Implications for Organizational Learning', Academy of Management Review, p. amr.2019.0470. doi: 10.5465/amr.2019.0470.

Boden, M. A. (1998). Creativity and artificial intelligence. Artificial intelligence, 103(1-2), 347-356.

Brem, A. (2011) 'Linking innovation and entrepreneurship – literature overview and introduction of a process-oriented framework', International Journal of Entrepreneurship and Innovation Management, 14(1), p. 6. doi: 10.1504/IJEIM.2011.040820.

Brem, A., & Bilgram, V. (2015). The search for innovative partners in co-creation: Identifying lead users in social media through netnography and crowdsourcing. Journal of Engineering and Technology Management, 37, 40-51.

Cooper, R. G. (2014). What's next?: After stage-gate. Research-Technology Management, 57(1), 20-31.

Dinov, I. D. (2018) Data science and predictive analytics: Biomedical and health applications using R, Data Science and Predictive Analytics: Biomedical and Health Applications using R. doi: 10.1007/978-3-319-72347-1.

Gregory, R. W. et al. (2020) 'The Role of Artificial Intelligence and Data Network Effects for Creating User Value', Academy of Management Review, 2, p. amr.2019.0178. doi: 10.5465/amr.2019.0178.

Kakatkar, C., Bilgram, V. and Füller, J. (2020) 'Innovation analytics: Leveraging artificial intelligence in the innovation process', Business Horizons, 63(2), pp. 171–181. doi: 10.1016/j.bushor.2019.10.006.

Lichtenthaler, U. (2020). Building blocks of successful digital transformation: Complementing technology and market issues. International Journal of Innovation and Technology Management, 17(01), 2050004.

Meinhart, W. A. (1966) 'Artificial intelligence, computer simulation of human cognitive and ...', Academy of Management Journal, 9(4), pp. 294–307.

Townsend, D. M. and Hunt, R. A. (2019) 'Entrepreneurial action, creativity, & judgment in the age of artificial intelligence', Journal of Business Venturing Insights. Elsevier Inc., 11(January 2019), p. e00126. doi: 10.1016/j.jbvi.2019.e00126.

Verganti, R., Vendraminelli, L. and Iansiti, M. (2020) 'Catalyst: Innovation and Design in the Age of Artificial Intelligence', Journal of Product Innovation Management, 0(0), pp. 1–16. doi: 10.1111/jpim.12523.

1.

Effective Venture Capital Market Development Concept

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Abstract The paper presents the conceptual model of the interplay among three key actors on whom Venture Capital (VC) activity in a particular country is dependant. They are 1) VC Ecosystem, 2) government and 3) society (Figure 1).

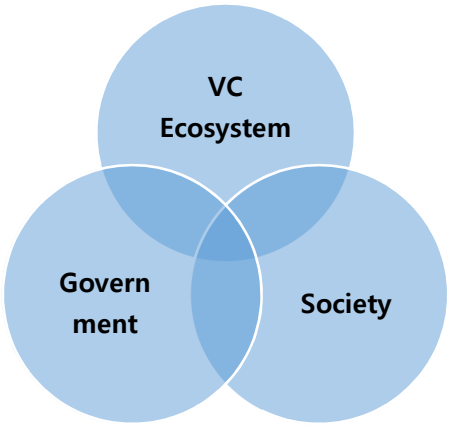

Figure 1 Conceptual model of VC market activity development dimensions

1) VC Ecosystem is formed not only by VC fund managers, but also by investors in these funds, consultants of the VC industry, portfolio companies of the funds, networking events; NGO's working for the industry etc.; 2) Government is regarded in a broader sense as all formal institutions related to the institutional environment and governance structures of an economic system (laws affecting the industry and the ecosystem, government effectiveness, regulatory quality etc.) or as structural formal institutions as defined by Grilli et al. (2018) and Williamson (2000). 3) Society, in general, is a reflection of embedded customs, traditions and other informal norms and as result it's acceptability of VC.

The model is built on the results of content analysis of existing studies about factors influencing VC activity. During the literature review, three main groups of factors

determining VC market were found: (i) supply-side factors; (ii) demand-side factors; (iii) factors influencing VC market activity in general. Regarding the last group, a subgroup with an unrealized potential of impact in Central and Eastern Europe (CEE) was discovered – particularly, factors influencing the possibility of entrepreneurs and Venture Capitalists to partner. Based on Institutional theory (Williamson 2000) and its applications in VC market studies (Li and Zahra 2012; Grilli et at. 2018) all factors were grouped by the possibility of direct/indirect impact on them and length of any expected changes as a result.

All factors were also grouped on how and by whom they can be impacted. The results revealed three key actors who can influence the factors and their interactions. Based on the grouping results and on analogy with existing triple helix innovation model the authors propose a similar model (Figure 1) explaining the interactions among three key actors determining VC activity. The specific of the countries with underdeveloped VC market is that these actors do not have equal footage there. Neither VC ecosystem has enough resources to develop itself and interact with government for developing a better local environment for the industry. Neither embedded attitudes of society are welcoming for VC development. The model lets to understand importance of governmental activities to boost the other two actors to the self-sustainability level of the VC market.

In numerous political documents European Union has acknowledged the necessity to boost entrepreneur's access to VC as a way to reach a higher level of R&D, innovation, productivity and employment. As result, the countries try to measure the market gap and decrease it by investing public resources in VC funds. Thus, the supply-side of the VC market is boosted, but other factors influencing the market usually are left out of the necessary attention. The returns from publicly co-financed funds as predicted by the studies are lower as for private funds. So, concentrating only on supply side and results achieved by increasing it could let to a willingness to stop public support for VC funds. The model could be a helpful tool to escape from such flawed appraisals. It allows assessing public initiatives with understanding that changes in only one side will not lead to the transformation of all VC market. The paper also provides grounds to necessity to see efficient VC market building process as a step-by-step activity where changes in the market activity are result of incremental changes and interplay of all three key dimensions.

Purpose/ Research Question: The purpose of the study was to develop a conceptual model of VC market activity determinants.

Key Literature Reviews: Many researchers have explored VC activity drivers. Existing studies could be divided by focus on a particular side of VC market they have: (i) supply-side; (ii) demand-side or (iii) factors influencing VC market activity in general. There is no common opinion should the demand or supply side be boosted to increase VC activity in general. Literature review revealed interactions between the demand-side and supply-side factors and common dimensions how they are changed. Also, the studies pointed to possibility of direct/indirect impact on the factors (Li and Zahra 2012; Grilli et at. 2018) and different length of expected changes depending on involved social capital features (Williamson 2000).

The research on innovation triple helix model (Becker et al. 2018) provides a theory on how conceptual models for understanding mechanisms of key dimensions interplay can be developed. Pinkow et al. (2020) provide an understanding of the link between innovation ad VC. The study of Matisone et al. (2020) reveals difference between countries with developed and underdeveloped VC markets which should be considered building the conceptual model for VC activity development.

Design/ Methodology/ Approach: To determine the factors influencing the VC market a content analysis of the literature was conducted. Web of Science was used to find relevant studies. The search terms were: Supply and VC; Demand and VC; VC activity; entrepreneur opinion and VC; entrepreneur openness and VC and willingness to partner. Additionally, studies cited in the selected articles were inspected.

Based on Institutional theory (Williamson 2000) and its applications in VC market studies (Li and Zahra 2012; Grilli et at. 2018) all factors were grouped by the possibility of direct/indirect impact on them and length of any expected changes as a result.

All factors were also grouped how and by whom they can be impacted.

(Expected) Findings/Results: Building on triple helix research (Becker et al. 2018) the authors propose a similar model explaining the interactions among three key actors determining VC activity.

Research limitations/ Implications: The model could be a helpful toll to escape from such flawed appraisals. It allows assesing public initiatives with understanding that changes in only one side will not lead to the transformation of all VC market. The paper also provides grounds to necessity to see efficient VC market building process as a step-by-step activity

where changes in the market activity are result of incremental changes and interplay of all three key dimensions.

Keywords: Equity Gap, Influencing Factors, Public Policy, Venture Capital.

Reference

1. Becker, B. A., & Eube, C. (2018). Open innovation concept: Integrating universities and business in digital age. *Journal of Open Innovation: Technology, Market, and Complexity*, *4*(1), 12.
2. Grilli, L., Mrkajic, B. & Latifi, G. Venture capital in Europe: social capital, formal institutions and mediation effects. Small Bus Econ 51, 393–410 (2018). https://doi.org/10.1007/s11187-018-0007-7
3. Li, Y., & Zahra, S. A. (2012). Formal institutions, culture, and venture capital activity: A cross-country analysis. Journal of Business Venturing, 27(1), 95-111.
4. Matisone, A., & Lace, N. (2020). The Impact of Public Interventions on Self-Sustainable Venture Capital Market Development in Latvia from the Perspective of VC Fund Managers. *Journal of Open Innovation: Technology, Market, and Complexity*, *6*(3), 53.
5. Pinkow, F., & Iversen, J. (2020). Strategic Objectives of Corporate Venture Capital as a Tool for Open Innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, *6*(4), 157.
6. Williamson, O. E. (2000). The new institutional economics: taking stock, looking ahead. *Journal of economic literature*, *38*(3), 595-613.

2.

The Impact of COVID-19 Pandemic on Consumer Behavior

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Abstract

This research is designed to analyze the changes in consumer behavior caused by COVID-19, including their purchasing priorities, attitudes towards products and services offered, and decision making while purchasing conditioned by changes in consumers' value system. The electronic survey provided both qualitative and quantitative data collected from respondents of very active purchasing ages who represent Generation X (39-58) and Generation Y (18-38). Therefore, the emphasis is laid on the comparative analysis of these two groups; this might play an important role in understanding how markets should be reorganized to meet these consumers' needs and worldview transformed during the pandemic. The set of research methods used in this study consists of electronic survey, qualitative content analysis, correlation analysis and Chi-square test.

Purpose/ Research Questions: How has COVID-19 pandemic impacted consumer behavior?

Key Literature Reviews (About 3~5 papers): Consumer behavior is influenced by cultural, social, economic, personal (age & life cycle stage, occupation & income, life style, social class, motives and attitudes), psychological, technological, environmental, political and many other factors (Madhavan & Chandrasekar, 2015). Changes in any of them might influence consumer behavior, which cannot always be predicted by marketers due to its complexity (Blackwell et al., 2006). As for COVID-19 pandemic and the lockdown with social distancing, they have disrupted consumer behavior which can be characterized by a new model consisting of: 1) hoarding of essential products for daily consumption; 2) improvisation when there are constraints; 3) postponing purchase and consumption of discretionary products or services; 4) embracing digital technology; 5) store coming home; 6)

blurring of work-life boundaries; 7) reunions with friends and family; 8) discovery of talent (Sheth, 2020). Thus, along with the tragedy caused by COVID-19 pandemic, it has also definite positive impact on consumer behavior - significant proportion of consumers have shifted to buying healthier, more sustainable food (Borsellino et al., 2020; Laguna et al., 2020), developing new priorities that include personal safety and social values (McKinsey & Company, 2020). Therefore, COVID-19 consumer behavior models can be characterized as deep learning models. To have more insight into the possibilities of responding to new consumer behavior and needs, first the impact of COVID-19 pandemic should be explored and comprehended in regard to consumers of different generations, ethnicities, genders, status, etc.

Design/ Methodology/ Approach: The data collection was realized via electronic survey designed for getting information about respondents': age and gender, status, place of work and living, members of household in order to conduct an inter-generational and inter-gender and other types of inter-group analysis to find out most specific combinations of demographic characteristics whose holders experienced most explicit impact by COVID-19. The qualitative content analysis of the responses to the complementary open-ended questions on: how buying habits have changed during the COVID-19 crisis; what shopping challenges have occurred and how values of life have changed; what happened to consumers' priorities and their style of buying; what products and / or services will be purchased online even after COVID-19, have shed more light on the interpretation of the corresponding closed-ended questions with standardized answer options. The Chi-square test of independence was used to compare categorical variables represented by different questions trying to find any associations between them. Correlation analysis was conducted to find any relationship between changes in purchasing behaviors and priorities across different types of products and services.

(Expected) Findings/Results: The preliminary analysis has revealed that COVID-19 has impacted consumer behavior and priorities, making people become more saving and thoughtful customers who weigh the value and real need in the products before buying, compare prices to find most optimal products. Besides, some purchasing priorities have shifted towards consuming healthy food – more fresh fruit and vegetables, more cereals and dairy products, less alcoholic drinks, sweets and snacks. As it was expected, entertainments - pay TV services, computer games, as well as online educational programs, are heading the ratings of purchasing priorities. The Chi-square test did not disclose explicit differences in the impact of COVID-19 on the consumer behavior of representatives of Generation X and Generation Y. However, this issue needs to be analyzed one more time after collecting additional data from Generation X representatives.

Research limitations/ Implications: The research is focused on the situation in Latvia which means that the generalization of the research findings could be suitable to countries with similar cultural, historical and economic backgrounds. In addition, as the data collection was realized by Riga Technical University Master's students, the majority of the respondents, being their friends, were of similar age, that is from Generation Y (about 76%). Meanwhile Generation X was represented by 18%. This disproportion will be eliminated by collecting additional data to represent both generations equally.

Keywords: consumer behavior, purchasing priorities, changes in behavior, Generation X, Generation Y, COVID-19

Reference

1. Blackwell, R., Miniard, P., & Engel, J. (2006). *Consumer behavior*. Mason: Thompson
2. Borsellino, V., Kaliji, S. A., & Schimmenti, E. (2020). COVID-19 Drives Consumer Behaviour and Agro-Food Markets towards Healthier and More Sustainable Patterns. *Sustainability*, 12, 26 p.
3. Laguna, L., Fiszman, S., Puerta, P., Chaya, C. Tárrega, A. (2020). The impact of COVID-19 lockdown on food priorities. Results from a preliminary study using social media and an online survey with Spanish consumers. *Food Quality and Preference, 86, 9p.*
4. Madhavan, M., & K.Chandrasekar, K. (2015). Consumer buying behavior-an overview of theory and models. *St. Theresa Journal of Humanities and Social Sciences 1*(1), *74 – 112.*
5. McKinsey & Company. (2020). The conflicted Continent: Ten charts show how COVID-19 is affecting consumers in Europe. *Marketing & Sales Practice*. 12 p.
6. Sheth, J. (2020). Impact of Covid-19 on consumer behavior: Will the old habits return or die? *Journal of Business Research, 117,* 280-283

3.

Dynamics of Business Models in Industry-wide Collaborative Networks for Circularity

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Abstract

Purpose/ Research Question: Incumbent, B2B manufacturing companies join forces and together form collaborative networks – so called consortia - aiming for increasing circularity of their products. The new, more open way of cooperation requires a novel approach towards changing the traditional logic of "doing business in a linear way". Value for the stakeholders gets defined and created differently. As a consequence, the collaboration impacts companies' and industry extant business models (BM) and leads to a dynamic adaptation of BM's key elements.
Our research question was: *How do the individual companies' and the industry's BMs dynamically adapt through the collaboration in the consortia for circular economy?*

Key Literature Reviews (About 3~5 papers): BM is an abstract concept, describing the logic of how the company does business and creates value (HOW), what its value proposition is (WHAT), for whom it creates value (WHO) and how it captures the value generated (WHY) [1], being referred to as a set of these interconnected elements [2]. The BMs' elements and the BMs themselves are subject to dynamic change over time [3]. Subject to the size and the scope of the changes, the BMs' dynamics mean either adaptive, incremental, or more abrupt, radical changes of the extant BMs.
Such changed, innovative BMs support transition to more sustainability and particularly to the circular economy (CE) [4]. CE aims for decoupling of the resource use from the economic growth and at reduction and elimination of waste. Inclusion of CE principles and application of its various strategies, conceptualized in the 9R framework [5], simplified in the 4R concept **R**educe-**R**euse-**R**ecycle-**R**ecover. Each of the **Rs** will require different configurations of the BMs' elements and will therefore lead to different dynamics of the BMs.
Successful transition to circularity needs to be supported by a strong communication towards the

customers. A needed behavioral change on both personal and organizational level can be supported for example by coaching [6], education and a strong value communication internally and externally.

Design/ Methodology/ Approach: Given the emerging research field of CE and an abstract concept of BM, a qualitative research strategy has been chosen. We have applied an in-depth multiple case study approach, conducted in a particular industry field that processes natural fibers into a component that becomes, for specific reasons, a difficult to efficiently collect and process waste. The data were collected through participant-observation as well as narrative and semi-structured interviews with renowned experts from the industry. In parallel, we have performed a both manifest and latent content analysis of the documents published by participating companies and specialized industry magazines. Employing multiple sources of evidence, we aimed for a triangulation of largely qualitative data and increased construct validity. The cross-case synthesis in combination with a pattern matching approach contributed to our understanding of how the original BM based on linearity of the resource use evolves towards an adapted, more circular one.

(Expected) Findings/Results: The incumbent B2B companies, participating in the subject industry's upper part of the supply chain, formed a semi-open access consortium for CE. The participants had to jointly develop new capabilities, including the readiness to collaborate differently, while staying strictly within the frame of anti-trust law. They needed to re-define the value proposition, creation and capture differently and had to be ready to share the value with a wider group of stakeholders. Also, a strong and new way of involving the B2B customers in lower parts of the supply chain was crucial and their awareness needed to be increased. As a result, the elements of BMs and the extant BM in the industry evolved towards a BM for circularity.

In the resulting *consortium supported BM for circularity*, we see the cWHO – the circular customer – element being adapted in a way of a partial role swap - the original customers become the potential suppliers and vice versa. The cWHAT – the circular value proposition – of the industry gets intangibly enhanced by including the strong sustainability proposition through inclusion of recycling activities. The cHOW – the circular value capture and circular value delivery – gets adapted by inclusion of brand-new partners – particularly network orchestrators, waste collectors and recyclers – who extend the supply chain. Both elements cWHAT and cHOW get higher relevancy in the adapted BM for circularity.

The cWHY – the circular value capture – gets initially negatively impacted across the supply chain by higher costs for running the consortium, performing the activities enabling collection and recycling, as well as sourcing recycled feedstock with higher costs than the virgin feedstock. In parallel, the potential of long term secured income through better customer retention reached by improved sustainability value proposition, is a promising reward.

We see strong and enhanced interdependencies between the elements cWHAT and cHOW if

compared to the extant, linear BM. The cWHO gets more and different interdependencies than in the extant linear business model.
We propose an explicit extension of the extant BM with a new key element cVCO – circular value communication – which includes namely customers' and partners' education across the supply chain towards raising the awareness about the inherent potential the CE constitutes. It becomes apparent that the extant element cWHAT, based on renewable resources alone, is not sufficient. It needs to be enhanced by strong communication towards the stakeholders in the ecosystem and supported by corresponding renewable and recycled certified feedstock use.

Research limitations/ Implications: Every raw material, feedstock, every product and every industry are individual, characterized by their particular specifics. The topic of BM dynamics is of high complexity and of a wicked nature, esp. if linked with CE strategies. Therefore, the dynamics of the BM in one industry might be different in another industry.
Fully reliable and verifiable data pertinent to transition to BMs for circularity are still rare, frequently confidential, potentially not unambiguously separable from linear BMs pertinent data, apart from a threat of their misinterpretations.

Keywords: Business models dynamics, circular economy strategies, incumbent companies, collaborative networks

References

1. TEECE, D. J. Business Models, Business Strategy and Innovation. *Long Range Planning* [online]. **2010**, 43(2), pp. 172-194 [cit. 2020-02-22]. ISSN 0024-6301. Available from: doi: 10.1016/j.lrp.2009.07.003.
2. ŠIMBEROVÁ, I.; KITA, P. New Business Models Based on Multiple Value Creation for the Customer: A Case Study in the Chemical Industry. *Sustainability* [online]. **2020**, 12, 3932, pp. 1-18 [cit. 2020-11-16]. ISSN 2071-1050. Available from: doi: 10.3390/su12093932
3. SAEBI, T.; LIEN, L.; FOSS, N. J. What Drives Business Model Adaptation? The Impact of Opportunities, Threats and Strategic Orientation. *Long Range Planning* [online]. **2017**, 50, pp. 567-581 [cit. 2020-10-26]. ISSN 0024-6301. Available from: doi: 10.1016/j.lrp.2016.06.006.
4. BROWN, P.; BOCKEN, N.; BALKENENDE, R. Why Do Companies Pursue Collaborative Circular Oriented Innovation? *Sustainability* [online]. **2019**, 11, 635, pp. 1-23 [cit. 2020-11-16]. ISSN 2071-1050. Available from: doi: 10.3390/su11030635
5. REIKE, D.; VERMEULEN, W. J. V.; WITJES, S. The circular economy: New or Refurbished as CE 3.0? – Exploring Controversies in the conceptualization of the Circular Economy through a Focus on History and Resource Value Retention Options. *Resources, Conservation & Recycling* [online]. **2017**, 135, pp. 246-264 [cit. 2020-09-28]. ISSN 0921-3449. Available from: doi:

10.1016/j.resconrec.2017.08.027

6. ROSHA, A.; LACE, N. The scope of coaching in the context of organizational change. *Journal of Open Innovation: Technology, Market, and Complexity* [online]. **2016**, 2:2, pp. 1-14 [cit. 2020-11-16]. ISSN 2199-8531. Available from: doi: 10.1186/s40852-016-0028-x

4.

Open innovation in the automotive industry to scale the business model

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Abstract

Purpose/ Research Question: The aim of this article is to find out what opportunities Open Innovation offers companies and how the Open Innovation process looks like and is used in companies. As a rule, companies open their innovation process to the outside world and involve customers and external partners in the process accordingly. It is generally assumed that companies with more suitable products are significantly more profitable on the market than companies that do not take open innovation into account. Customers are expected to accept products inelastically, which allows suppliers to achieve significantly better margins (Faber, 2009, p. 1).
The investigation in the context of this article will focus in particular on the automotive industry, as the sector has been characterized by innovation processes for many years and is currently undergoing considerable change, particularly as a result of the digital revolution. The industry in particular is known for being very reticent about new innovations and tends to keep them a secret. At present, the automotive industry cannot be called open innovation.
One of the research questions was: *"Can Open Innovation scale the business model in the automotive industry?"*

Key Literature Reviews (3-5 papers): The speed at which innovations are needed is therefore becoming a decisive instrument for how successful companies are in the market. The high speed is a particular advantage of Open Innovation, which should be used in any case (Rotjanakorn, et al., 2020). In addition, ecological sustainability has become one of the most important criteria for determining how successfully a product can be placed on the market. Modern innovations in particular must not neglect the aspect of sustainability (Tolstykh, et al., 2020).
According to Chesbrough, an innovation is the implementation of an invention on the market. Companies that are not innovative will die (Hanisch, Grau, 2020, pp. 1-3).

Design/ Methodology/ Approach: Secondary and primary research is carried out. Secondary research is conducted through a literature search on the Web of Science, EBSCO and Scopus portals.

The aim is to gain insights into how the topic of Open Innovation has already been dealt with in the literature in recent years.
In addition to secondary research, an online survey will be conducted on primary research. Two areas will be covered accordingly. On the one hand, it should be clarified whether the respondents have already participated as customers in an innovation of a company by actively participating in product development or similar processes. Secondly, it should be clarified whether they have already participated as employees in the development processes of new products, offers or services or whether the concept of open innovation has been implemented in the company.
The question will also be answered as to whether the participants were able to determine that the companies were able to scale their business model by actively using the open innovation concept.
The Scientific aim is: Check the scalability of the business model through the use of open innovation.

(Expected) Findings/Results: However, the complexity of products is increasing significantly, especially in today's world (Rauter, et al., 2018). In Open Innovation, cooperation takes place in the innovation process. According to Reichwald and Piller, in the outside-in process internal tasks are outsourced to customers, users or other stakeholders (Kowalski, 2018, p. 22). In the Inside-Out process, ideas from within the company are passed on to the outside world so that benefits and concrete improvements can flow back into the company (Hanisch, Grau, 2020, pp. 15-18).
In the course of the research, it will become clear that the advantages of open innovation will outweigh the possible risks. Tesla was one of the first manufacturers in the automotive market to understand that it is precisely using the data. In addition, open innovation can reduce time-to-market and cost-to-market (Piller, et al., 2017, p. 69). Open innovation can become a strategic competitive advantage for companies (Wang, et al., 2020).
Open Innovation offers considerable potential for growth. This potential should not remain unused, which is why it is recommended that even the still rather conservative automotive industry should rely on Open Innovation. An actual loss of ideas and knowledge does not tend to go hand in hand with this. However, the survey assumes that most of the participants had little or no contact with Open Innovation. Especially the integration of the customer is important in order to develop a product that is as suitable as possible and to realize a high level of loyalty. As a result, larger market shares and a scaling of the business can be realized.

Research limitations/ Implications: The limits of the research in this article are mainly in terms of scope, since the topic of open innovation has many areas. Only a small part can be covered. In addition, only a limited number of people can be interviewed on the topic of Open Innovation. The questionnaire will be addressed mainly to persons from Germany.

Keywords: Open Innovation, customer integration, automotive industry, business model, scaling

JEL Classification: M15, M21

References

Faber, M. J. (2008). Open Innovation: Ansätze, Strategien und Geschäftsmodelle (1. Aufl). Gabler.

Hanisch, D., Grau, R., & Springer Fachmedien Wiesbaden GmbH. (2020). Best Practice Open Innovation 7 Methoden und welche Fehler es zu vermeiden gilt. https://doi.org/10.1007/978-3-658-31443-9

Rotjanakorn, A.; Sadangharn, P.; Na-Nan, K. Development of Dynamic Capabilities for Automotive Industry Performance under Disruptive Innovation. J. Open Innov. Technol. Mark. Complex. 2020, 6, 97.

Kowalski, M. (2018). Management von Open-Innovation-Netzwerken. Springer Fachmedien Wiesbaden. https://doi.org/10.1007/978-3-658-20907-0

Piller, F. T., Möslein, K., Ihle, C. C., & Reichwald, R. (2017). Interaktive Wertschöpfung kompakt: Open Innovation, Individualisierung und neue Formen der Arbeitsteilung. Springer Gabler.

Rauter, R. (2018). Open innovation and its effects on economic and sustainability innovation performance. 8.

Tolstykh, T.; Gamidullaeva, L.; Shmeleva, N. Elaboration of a Mechanism for Sustainable Enterprise Development in Innovation Ecosystems. J. Open Innov. Technol. Mark. Complex. 2020, 6, 95.

Wang, Y., Phillips, F., & Yang, C. (2021). Bridging innovation and commercialization to create value: An open innovation study. Journal of Business Research, 123, 255–266. https://doi.org/10.1016/j.jbusres.2020.09.052

5.

Innovations of the Management System in Small and Medium Sized Enterprises: Problems and Solutions

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Abstract

Purpose/ Research Question:
Small and medium-sized enterprises (SMEs) are the backbone of the economy. In Europe SMEs represents up to 99% of all businesses and provide two-thirds of the total private sector employment. Large proportion of enterprises in a private sector is owned by individuals or families and at the same time managed by their founders or owners.
Despite the growing significance of the SME sector to economy, business literature as well as training programmes still lag behind and tend to use large companies and corporations, which are run by professional management teams, as a best practice example.
This research review literature on management system development in small and medium enterprises and compare previous findings with several owner-managed medium-sized company cases from different European countries. Cases will be compared to find possible similarities and differences across different companies and different business environments. Purpose of this paper is to enlighten challenges SMEs are facing and possible solutions that will contribute to improving their management and sustainability.

Key Literature Reviews.
Literature review will include recent theoretical and empirical findings in the small and medium business area, with particular focus on management system development in owner-managed

companies, as well as concepts of innovation and open innovation.

Management system, according to Kaplan and Norton is the integrated set of processes and tools that a company uses to develop its strategy, translate it into operational terms and monitor and improve effectiveness of both. [5].

Empirical large-scale postal survey of owner-managed small and medium sized enterprises (SMEs) conducted in the UK explored the association of small business managerial style and performance. This survey revealed that the managerial style of entrepreneurs is influenced by a series of demographic and situational factors. Moreover, according to this research, owner-managed businesses characterized by delegation of authority appeared to achieve higher growth in sales and operated in a more professional way [6].

Implementation of the management system itself can be described as a process, and Garengo and Biazzo suggested the framework process for implementation of Integrated Management system (IMS) in SME. Their framework was based on changeover from the adoption of ISO quality standards to the implementation of an IMS [2].

For an owner-managed company, entrepreneurial behaviour of owner-manager is affected by their personal values and views. Jaouen & Lasch suggested a new typology of owner-managers, exploring the extent to which the views of owner-managers regarding growth and lifestyle issues affect their entrepreneurial behaviour. Typology suggested consists of four owner-manager views associated with success, subsistence, hedonism and paternalism, and investigates the differences in the behaviours associated with these four profiles [4].

Open innovation has been defined as the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively [1]. Small and medium enterprises have limited internal resources and internal knowledge and shall use external knowledge; however, diversity in the SME sector is high. identified several trends how open innovation develops were identified by Chesbrough et.al. One of trends is that innovation goes from large companies to SMEs. Other trend is that industry is starting to professionalize the internal processes to manage open innovation more effectively and efficiently. Nevertheless, it is assumed currently still more as trial and error than a professionally managed process [3].

This research will analyse innovation in the management system of the small and medium enterprises linking both system and process aspects with the owner-manager personality traits.

Design/ Methodology/ Approach:

Research starts with a literature review using the state-of-the-art method to understand previous research on management system development in small and medium enterprises and owner-managed companies in particular. Then structured interviews with owners-managers of small and medium sized companies are conducted to identify underlying factors and particularities on how management system is developed in these companies. This is followed by comparison of findings

from literature review and case companies and drawing key conclusions.

Expected Findings/Results:
This paper will enlighten challenges that SMEs are facing in context of current business environment and contribute to discussion on possible solutions that helps to improve management of the SMEs and their sustainability.

Research limitations/ Implications:
This paper focuses on a Management system as a general set of processes and practices in a company, and not specifically on IT solutions used for enterprise resource planning performance management or other management processes (like ERP (Enterprise Resources Planning) or BI (Business Intelligence) systems, and others). Conclusions from field research are relevant to those particular small and medium-sized companies analysed in this research, and shall not be generalized to wider segments without additional research and validation.

Keywords: Small and medium-sized enterprises. Management system. Management processes. Owner-manager.

Reference

1. Chesbrough, H. W. Open Business Models: How to Thrive in the New Innovation Landscape. Research technology Management, 50, **2006,** 256.
2. Garengo, P., & Biazzo, S. From ISO quality standards to an integrated management system: an implementation process in SME. Total Quality Management & Business Excellence, 24(3–4), **2013,** 310.
3. Gassmann, O., Enkel, E., & Chesbrough, H. The future of open innovation. R and D Management, 40(3), **2010,** pp. 213–221.
4. Jaouen, A., & Lasch, F. A new typology of micro-firm owner-managers. International Small Business Journal, (November), **2013,** pp. 1–25.
5. Kaplan, R. S., & Norton, D. P. Mastering the management system. Harvard Business Review, 86(1). **2008** pp. 1-16.
6. Wang, Y., & Poutziouris, P. Leadership styles, management systems and growth: empirical evidence from UK owner-managed SMEs. Journal of Enterprising Culture, 18(3), **2010,** pp. 331–354.

6.

The Role of Customer Experience Driven Innovation in an Organizations` Business Processes

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Abstract

Purpose/ Research Question: With technological advances and impactful socioeconomic changes, we are moving towards an experience economy. This means that organizations are focusing more on their customers – they need to innovate and meet the expectations and keep their competitive edge [1]. Customer Experience Management is considered an effective approach to manage a customer entire experience with a product or a company and to create incremental innovation and improvement to the customer's lived experience. Any implementation of experiential innovation involves an organization's business processes – as well as vice versa: process optimization efforts may impact the lived experience of customers [2]. However, there are issues highlighted by many authors: too heavy focus within Business Process Management on reducing cost and improving efficiency and neglecting customer interactions, CEM being too focused on customer interactions and neglecting internal processes [3]. A traditional approach to focus enterprise architecture on process standardization, rather than focusing on a continuous adaptation to a changing landscape, stifles innovation and creates an experience that is lagging – it's required to adjust the business model to the up-to-date needs and satisfaction of customers [4], [5]. The aim of this research is to determine and propose a framework on how customer experience driven business innovation can be applied to improve an organizations' business processes.

Key Literature Reviews (About 3~5 papers):

The definition of Customer Experience, although still debated, is generally accepted in the scientific community as the cognitive, physical, sensory, emotional and social responses evoked by a (set of) market actor(s), and has three basic tenets: its interactional nature, a specific level of uniqueness for every experience and a multidimensional nature [1]. Models have been proposed, aligning business model innovation and customer experience in order to alleviate issues related to CX activities being often disconnected from an organizations' core business model and processes, however, does not

specifically address implications on business process management [2]. Similarly, there have been efforts to create a framework with the aim of aligning open innovation, business process management and business model innovation with the aim of enhancing an organizations' ability to create shared value, however, authors also highlight the need to include customer experience in this framework, in order to bring knowledge and insights from outside the organization [6], [7]. And lastly, there is a suggested approach on integrating customer experience management and business process management, by using customer journeys to promote innovation and business transformation – this model aligns the two concepts by using the business process management lifecycle as the foundation, and introduces customer experience management tools and methods into the lifecycle – yet it does not include innovation processes in the model [3].

Thus, while most authors agree on the importance that customers and their experience should have on an organization's business processes, the need to constantly innovate and adjust internal processes according to the demands and requirements of the customers and not vice-versa, currently there is a gap in the field. Extensive research (both practical and theoretical) has been conducted to align two of the concepts at a time, however there is no proposed framework or approach on aligning and integrating all three: customer experience, business process management and innovation (business model innovation) [2], [3], [6].

Design/ Methodology/ Approach: Literature review method is used for the development of this research paper. This research reviews and analyzes existing approaches on integrating the three main concepts of this research (CX, BPM and BMI), and as a result, proposes a new framework on how to integrate the three concepts at once.

(Expected) Findings/Results: The research builds on established and tested approaches on how to align certain aspects of customer experience, business model innovation and business process management, but bridges the gap between the concepts by integrating business model innovation, the process management lifecycle and customer journey mapping to create an inclusive model.

Research limitations/ Implications: The paper focuses mainly on business model innovation and open innovation models, as those predominately center around identifying customer needs and requirements. As this is a theoretical model, future research should empirically test this theoretical framework, to identify any gaps and improvement possibilities.

Keywords: business process management, customer experience management, business model innovation

Reference

[1] A. De Keyser, "Understanding and managing the customer experience," *PhD Ser. Ghent Univ. Fac. Econ. Bus. Adm.*, **2015**.

[2] T. Keiningham *et al.*, "Customer experience driven business model innovation," *J. Bus. Res.*, no. January, pp. 0–1, **2019**, doi: 10.1016/j.jbusres.2019.08.003.

[3] D. Pavlić and M. Ćukušić, "Developing a Structured Approach to Converging Business Process Management and Customer Experience Management Initiatives," in *Lecture Notes in Business Information Processing*, vol. 68, **2019**, pp. 151–166.

[4] Babiča, V., Ščeulovs, D. Business Opportunities Unclaimed: Digital Disruption of Business Models. No: 11th International Multi-Conference on Complexity, Informatics and Cybernetics (IMCIC 2020): Proceedings. Vol.2, USA, Orlando, **2020**. Winter Garden, Florida: International Institute of Informatics and Systemics (IIIS), 2020, 88.-92.lpp. ISBN 978-1-950492-32-9.

[5] M. Kirchmer, "Successful Innovation through Business Process Management," *BTOES Insights (http//insights.btoes.com/business-transformation-operational-excellence/successful-innovation-through-business-process-management)*, no. January, **2017**.

[6] M. Kirchmer, "Innovation : more and more," p. 12, **2011**.

[7] B. Abdulkader, D. Magni, V. Cillo, A. Papa, and R. Micera, "Aligning firm's value system and open innovation: a new framework of business process management beyond the business model innovation," *Bus. Process Manag. J.*, vol. 26, no. 5, pp. 999–1020, **2020**, doi: 10.1108/BPMJ-05-2020-0231.

7.

Influence of non-product related attributes on media brands consumption

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Abstract

Purpose/ Research Question: The purpose of research presents the importance and role of the brand non-product related attributes - user imagery, usage imagery, secondary brand associations – on local media content consumption in Latvia. New patterns in media consumption regarding volume, channel, device, time, attitude have emerged due to the development of technologies. Social network sites created new possibilities for content distribution, readership, branding. Social network sites allow brands to map possible connections on social network sites to disseminate information and to expand their relationships [1]. Previous studies have proven that for brands, social network sites are a tool to build relationships as well as network connections for the promotion of the brand and marketing [1]. Increasing usage of global social network sites brings not only opportunities for media to reach the audience, but also new challenges and competition for local media. Younger audience (15–24 y.o.) consume traditional media below average, prefer media content on online platforms, access content via mobile devices, use social media more than other age groups [2], chooses international media, social network platforms over local media content.[2] Changes increase difficulties to attract and grow the future audience – the younger generation who uses less local media content, less media content in the Latvian language, has used to do it via social media platforms. The authors analyze the challenges of Latvian media brands, highlight the media brand associations that impact media brand equity. The research goal is to identify media brand non-product related attributes that directly influences the younger audience media brand usage, increase usage, engagement. The research task is to identify media branding attributes that increase media brand content consumption, engagement.

Key Literature Reviews: The media consumption changes have created challenges for media brands

to build, maintain substantial brand equity. Brand and brand equity is also analyzed from the perspective of the consumer as consumed-based brand equity and defined by Keller in the context of a differential effect that brand knowledge has on consumer response to the marketing of that brand. Brand equity means value for customers considered in terms of satisfaction, and trust, value for the company considered in terms of marketing programs, and competitive advantages [3]. Keller highlighted brand knowledge, including brand awareness and brand associations. He proposed four complex elements: brand identity, including brand salience and brand awareness; brand meaning, with brand performance and brand imagery, referring to brand associations; brand responses including consumer feeling, judgments; as well as relationships with brand-related to brand loyalty [3]. Use of multiple delivery outlets has the potential to dilute brand associations for media brands [4]. Communication in social media is modifying how the businesses, their consumer behavior interact. [5] More fluidity in content moving across multiple platforms, the brand identity of the source might become less relevant, mainly, when the content or programming itself has acquired its unique brand associations [6]. Content consumption via multiple platforms decreases brand associations with a content creator and distributor; therefore, multi-platform media content experience benefits audience reach, while drops brand associations of media content creators.

Design/ Methodology/ Approach: The research is based on primary and secondary sources - in-depth interviews with media managers, focus groups, consumer research, quantitative empirical research with a sample size of 300 respondents in 15-24 years old audience segment. Quantitative empirical research supports findings of focus groups to discover the most significant brand attributes that (1) build a positive attitude towards local media brands, (2) increase usage within the younger audience in Latvia, (3) determine brand equity building aspects significant to consume local media, (4) define brand awareness and brand image aspects that increase positive brand attitude and usage.

Findings/Results: Three non-product related brand attributes as user imagery, usage imagery, secondary associations are significant for a younger audience. Media brand user imagery and usage imagery on social network sites build favorability, the strength of brand associations. The youngsters are more inclined to follow, engage with their own defined influencers, peer's authorities, bloggers, media authors. [2] These personas influence brand decisions more than media communication, traditional advertising. Recommendations, reviews, content sharing by influencers increase favorability of brand associations. Word of mouth is when consumers' interest in a product or service is reflected in their daily dialogues. Word-of-mouth marketing can be encouraged through different publicity activities set up by brands, or by having opportunities to encourage consumer-to-consumer and consumer-to-marketer communications [1].

Research limitations/ implications: The research focuses on local online media brands, media brands with online extensions in the Latvian language. The authors present a conceptual framework for local media owners to develop consumer-centric branding strategies, to create new value chains for the audience by generating intense content experiences outside media platforms, to build local media brands by branding content for the younger audience. Further research should integrate the findings from ongoing quantitative empirical research into media branding as branding content perspective by further building engagement models for media brands.

Keywords: brand, media branding, brand attributes.

Reference

1. Ho, C.-W.; Wang, Y.-B. Does Social Media Marketing and Brand Community Play the Role in Building a Sustainable Digital Business Strategy? *Sustainability*, **2020**, *12*, 6417.

2. Consumer Connection System Latvia, 2018, Dentsu Aegis Network Latvia research data, 2012-2018.

3. Górska-Warsewicz, H. Factors Determining City Brand Equity—A Systematic Literature Review. *Sustainability*, **2020**, *12*, 7858.

4. Chan-Olmsted, S. "Media branding in a changing world: Challenges and opportunities 2.0.", The International Journal on Media Management, 13(1), 2011, pp. 3–19.

5. Fondevila-Gascón, J.-F.; Polo-López, M.; Rom-Rodríguez, J.; Mir-Bernal, P. Social Media Influence on Consumer Behavior: The Case of Mobile Telephony Manufacturers. *Sustainability*, **2020**, *12*, 1506.

6. Keller, K. L. "Building customer-based brand equity: A blueprint for creating strong brands", Management Science Institute, 1(107), 2001, pp.1–31.

8.

The effectiveness of depicting traditional masculinity in advertising

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Abstract

Purpose/ Research Question:
The aim of the research is to explore effectiveness of advertising, particularly how brands are effectively selling masculinity to the consumers. Many researchers of advertising have discovered that masculinity is now branded (Scheibling, Lafrance, 2019) and men are increasingly marketed to and offered visions of masculinity for consumption, in other words, masculinity has become a product (Zayer et al., 2020). However, it is unclear what consumers think about this product, that is masculinity, and what consumers think about the approach that advertisers and brands ar using in order to sell masculinity. For the purpose of determining whether masculinity is being sold effectivly to men and consumers in general, it is neccessery to research consumer perceptions of masculinity and their approval of the current methods used by advertsisers. Since there are multiple ways how to depict masculinity in advertising, this particular research is focussed on the traditional masculinity in advertising.

The research question is: What is the current consumer perception of traditional masculinity in advertising and how should masculinity be depicted in advertising to ensure effectiveness for the advertisers?

Key Literature Reviews:
While there are many different definitions of masculinity, the one that combines most of the elements of masculinity is that "Masculinity is both a product of social learning and a process, subject to ongoing construction in social interaction (Berke et al., 2018). This description of masculinity is echoed by large number of researchers saying that masculinity is a social construct rather than a biological phenomenon, and it is manifested through social displays, competition and position in social hierarchy (Modlinska et al., 2020). In addition, there are different types of masculinity such as traditional masculinity, hybrid or complicit masculinity and finally modern or inclusive masculinity.

However, this research as mentioned is focused on how effectively is traditional masculinity being sold through advertising. How to advertise the product is an important marketing issue that can increase company's competitiveness. Advertising can increase a product's sales volume and introduce new products to the market by making it known and familiar to

consumers (Thongkham and Srivarapongse, 2019) as well as position the product in an appealing way to persuade consumers. In the case of selling masculinity advertisers have to depict masculinity in a way that consumers will appreciate, and will make the connection, that the product is the key to become a man like the one portrayed in the advertisement. When it comes to the traditional masculinity, this ideal masculine figure is competitive in the sense that he tries to be better than others (Franz-Balsen, 2014). In short: he is a winner, not a loser, which means that subordination of others (women, homosexual men or less successful men) is implicit in this concept of masculinity (ibid). This classification of men is called "hegemonic masculinity" by Raewynn Connell and it is being associated with traditional masculinity ideals along with emotional stoicism, independence, physical strength, dominance, ambition, aggression, being a breadwinner and other key characteristics. Essentially, traditional masculinity in the scientific literature is being associated with stereotypical ideals of what it means to be a man.

In advertising, however, there are mixed results of how much consumers appreciate this traditional depiction of men to sell masculinity ideals. While some studies show results that consumers approve more progressive or modern depictions of men, others, for instance, Orth and Holancova (2003) have found that consumers tend to approve more stereotypical role illustrations in advertising, which translates into a more positive ad and brand attitudes (De Meulenaer et al., 2018). Researchers also note that the use of stereotypes has come under increased scrutiny, due to the fact that gender roles in society are changing, thus marketers are running the risk of alienating people by using traditional gender stereotypes (Hupfer 2002; De Meulenaer et al., 2018). However, the results from the scientific literature are inconclusive and demand further research into this issue.

Design/ Methodology/ Approach:

Considering that masculinity is a construction that emerges in the meeting of a variety of discourses and ideologies (Knudsen, Andersen, 2020, 64), it is crucial to discover what exactly these discourses are all about from a consumer perspective. It is argued that discourse analysis helps the researcher to pinpoint the key characteristics, behaviours and opinions of consumers (Tannen et al., 2015). Therefore, the authors of this research decided to choose discourse analysis as the fundamental way of analysing data gathered through YouTube comments from the consumers. Discourse is best viewed not as an abstract system but as 'situated' language use in the contexts in which it takes place (Jorgensen et al., 2002, 129), in this case the context will be specific advertisements posted on YouTube where consumers express their approval or disapproval for advertisements focused on masculinity. Discourse analysis is the analysis of patterns in the text, but taking into consideration the context.

The reason for choosing YouTube comments is that it provides a certain level of authenticity (Tolson, 2010). Many researchers argue for YouTube as the platform where to get insightful idea about what consumers care about and appreciate. The authors has selected several advertisements where traditional masculinity is at the core of the sales message and where there is large consumer engagement, expressed in large amount of YouTube comments. YouTube is a key site where the discourses of par-ticipatory culture and the emergence of the creative, empowered consumer have been played out (Benson, 2016). The three advertisements selected

that matched the criteria for traditional masculinity and consumer enaggement are Old Spice's "The man your man could smell like"; Barbasol's "Shave like a man" and Dos Equis "The most interesting man in the world".

(Expected) Findings/Results:

The authors is expecting to find answers to the research questions and make a determination if traditional masculinity ideals are appreciated by the consumers in the current social climate. Therefore, understanding if marketers and brands should depict men in their advertising in a stereotypical way as aggressive, ambitious, dominating and as being breadwinners or in a more inclusive and broader way, distancing themselves from typically associated characteristics of masculinity. Many advertisers depict men in their advertising but a few of them if any have understanding on this vital issue. Due to the cultural shift that is taking place in Western society, where gender roles are less defiant and there is conversation about male dominance and equality, this research will give an idea to advertisers what way of depicting men can be most effective for their bottom line.

Research limitations/ Implications:

This research will provide an insightful look into today's consumer and their ideals of masculinity, which is a product that a lot of brands are selling in their advertising. However, since masculinity is a socially and culturally constructed concept, this research is focusing on Western culture and the masculine ideals of the current social climate in Western culture. This is done so, due to the fact that the idea of masculinity differs from one part of the globe to another and the advertisements that will be selected in the analysis part are developed in the Western countries for their customers.

Keywords: traditional masculinity, gender, brand, advertising, marketing.

References

1) Scheibling, C., Lafrance, M. (2019). Man Up but Stay Smooth: Hybrid Masculinities in Advertising for Men's Grooming Products. Journal of Men's Studies Volume 27, Issue 2, 1 June 2019, Pages 222-239

2) Zayer, L.T., McGrath, M.A., Castro-González, P. (2020). Men and masculinities in a changing world: (de)legitimizing gender ideals in advertising. European Journal of Marketing Volume 54, Issue 1, 6 January 2020, Pages 238-260

3) Berke, D.S., Reidy, D., Zeichner, A. Masculinity, emotion regulation, and psychopathology: A critical review and integrated model. Clinical Psychology Review Volume 66, December 2018, Pages 106-116

4) Modlinska, K., Adamczyk, D., Maison, D., Pisula, W. (2020). Gender Diferences in Attitudes to Vegans/Vegetarians and Their Food Preferences, and Their Implications for Promoting Sustainable Dietary Patterns–A Systematic Review. Sustainability 2020, 12(16), 6292; 05 Aug 2020

5) Thongkham, M., Srivarapongse, T. (2019). Improved Diferential Evolution Algorithm to Solve the Advertising Method Selection Problem. J. Open Innov. Technol. Mark. Complex. 2019, 5(3), 61; 22 Aug 2019

6) Franz-Balsen, A. (2014). Gender and (Un)Sustainability—Can Communication Solve a Conflict of Norms? Sustainability 2014, 6(4), 1973-1991; 10 Apr 2014

7) Orth, U.R., and D. Holancova. 2003. Consumer response to sex role portrayals in advertisements: Effects of incongruity and prejudices on emotions and attitudes. Journal of Advertising 32: 77–89.

8) De Meulenaer, S., Dens, N., De Pelsmacker, P., Eisend, M. (2019). How consumers' values influence responses to male and female gender role stereotyping in advertising. International Journal of Advertising, Volume 37, Issue

6, 2 November 2018, Pages 893-913
9) Hupfer, M. 2002. Communicating with the agentic woman and the communal man: Are stereotypic advertising appeals still relevant? Academy of Marketing Science Review 3: 1–15.
10) Knudsen, G. H., & Andersen, L. P. (2020). Changing Masculinity, One Ad at a Time. Westminster Papers in Communication and Culture, 15(2), 63–78.
11) Tannen, D., Hamilton, H.E., Schiffrin, D. (2015). The Handbook of Discourse Analysis (Second edition). Wiley Blackwell Publication. 983 pages
12) Jorgensen, M., Phillips, L.J. (2002). Discourse analysis as theory and methods. London: Sage publications. 240 pages.
13) Tolson, A. (2010). A new authenticity? Communicative practices on YouTube, Critical Discourse Studies, 7:4, 277-289
14) Benson, P. (2016). The Discourse of YouTube : Multimodal Text in a Global Context. New York: Routledge

9.

Technology-Rich Study Process: Quality Evaluation and Challenges of Innovativeness

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Abstract

Purpose/ Research Question: According to the concept of *quality* [12], it refers to the perception of fulfilment of the needs, expectations and satisfaction of all stakeholders of the university. Especially both teachers and students should perceive the educational processes as valuable [1]. Students are the most important stakeholders. Students' needs and expectations have to be identified and used for assurance and improvement the quality of higher education. There are many factors that affect students' understanding of the quality of higher education. Some factors are used for quality assessment and control, others – for quality assurance and improvement, and other reasons. Stakeholders' understanding of quality is not constant, it changes under the influence of many external factors. Students' understanding of quality in 2020 is not the same as it was in 2019. The current research investigates factors and criteria that affect students' understanding of the quality of higher education due to the changes that occurred in 2020, comparing them with the results of previous research.

Key Literature Reviews: Higher education institutions (HEIs) play a decisive role in shaping the national intellectual potential. There are two concepts of higher education: as a public good and as a commercial service. It is argued that such concepts connect two main quality views about higher education: one emphasizes the social aspect and the other focuses on the economic aspect. Finally, a 'middle way' is proposed as a desirable alternative to these views [2].

For Latvia, regaining its independence in 1991 was the starting point of a new stage in higher education and understanding of the notion of quality. Quality is one of the most strategic drivers of higher education [11]. Modern managers, incl. management of HEIs, are actively analyzing directions of industry development and looking for solutions to ensure that the organization meets the requirements of the industry, the stakeholders, and education policies [4], [6], [7], [9], [13] [14].

In the last decades, quality criteria and assessment procedures have changed both at the national and European levels. More attention is paid to change rather than control, to development rather than evaluation, to innovation rather than conformity [8].

A lot of the contemporary quality descriptions originate from the concept that quality is the degree up to which customer expectations are met [10]. The best that can be achieved is defining as clearly as possible the criteria that each stakeholder uses when judging quality and to take into consideration these competing views when assessments of quality are undertaken [3]. Different groups of stakeholders have different goals, needs and priorities and use different criteria. The results of the majority of studies show that students are the most important stakeholders. Students define, use and assess the quality of higher education.

Students have always wanted a modern learning environment and achieve high level of professional competence. Rapidly changing world places difficult demands on universities – simultaneously to provide high quality of higher education based on fundamental traditions and values, as well as to meet the changing expectations and needs of students.

Design/ Methodology/ Approach: Literature review, qualitative content analysis and QFD methodology were applied in this research. Literature review highlights the actual reforms and shared tools in the higher education area, as well as the contemporary concept of the quality of higher education. Qualitative content analysis was used to identify factors of the quality of higher education used in the Bologna process, university strategies and scientific articles in 2015-2020. NVivo11 computer software package was used for qualitative data analysis. The QFD methodology provided an opportunity to determine the students' high priority needs, requirements and the significance of those study program components that create students' opinion about the quality of higher education according to the professional competence they need and expect. Results of the students' survey and QFD developed in 2015-2019 were compared with the results obtained in 2020.

(Expected) Findings/Results: According to the literature review and qualitative content analysis, five groups of factors of the quality of higher education were identified. Some of the factors are strongly related to the study program components, others are related to the external factors and results. Students' survey conducted in 2015-2019 shows that student expectations are exceeded in those skills that are developed evenly in all or almost all courses, in comparison to the skills that are developed in a concentrated way in one or some of the courses. The accumulation of skills in small doses but steadily and constantly, in the students' perception, cumulatively forms the greatest added value [5]. No significant differences between factors identified theoretically by using qualitative content analysis and factors used by students for assessment of the quality of the study program were identified.

Students' survey conducted in 2020 shows new trends in students' understanding of quality. Technology, innovativeness and flexibility as new criteria for the assessment of the quality of study content and methods, professors' competence, university infrastructure, mobility opportunities and

others components of the study program were mentioned. This situation creates new challenges to ensure the quality of higher education. Universities need to use appropriate methods and instruments to identify students' needs and expectations, analyze factors that affect the quality of higher education, including students' understanding of them, and further improve quality. Since 2020 the quality of higher education includes technology-rich, innovative and flexible studies.

Research limitations/ Implications: Literature review based on the materials and previous research findings developed in 2015-2020. The survey was conducted and QFD methodology was used at the Faculty of Engineering Economics and Management of Riga Technical University.

Keywords: factors, quality criteria, quality of higher education.

Reference

1. Anttila, J., Jussila, K. Universities and smart cities: the challenges to high quality, *Total Quality Management*, Volume 29, Issue 9, **2018**, pp. 1058-1073.

2. Bertolin, J. Ideologies and perceptions of quality in higher education: From the dichotomy between social and economic aspects to the 'middle way', *Policy Futures in Education*, Volume 14, Issue 7, **2016**.

3. Burrows, A., Harvey, L., Green, D. Concepts of quality in higher education: a review of the literature, *Quality in Higher Education*, **1992**, p. 8, available at: https://www.scribd.com/document/140128992/Burrows-Harvey-and-Green-Concepts-of-Quality-in-Higher-Education-a-Review-of-the-Literature# (accessed 22 December 2018).

4. Dahlgaard-Park, S.M. Reviewing the European excellence model from a management control view, *The TQM Journal*, Volume 20, Issue 2, **2008**, pp. 98-119, available at: https://doi.org/10.1108/17542730810857345

5. Degtjarjova, I., Janauska, J., Lapiņa, I., Mazais, J., Pildavs, J. Quality Assessment of Study Program: Application of Quality Function Deployment Methodology. *22nd QMOD Conference Proceedings*, Krakow, **2019**, pp. 12.

6. Iljins, J., Skvarciany, V., Gaile-Sarkane, E. Impact of organizational culture on organizational climate during the process of change. *Social and Behavioural Sciences*, Volume 213, Issue 1, **2015**, pp. 944-950, available at: https://doi.org/10.1016/j.sbspro.2015.11.509

7. Iljins, J., Zeps, A., Ribickis, L. RTU approach to pursuing excellence: sustainable integration of internal quality system in the strategy development. Pilot project review, *Education Excellence for Sustainability 2017 proceedings of the 45th SEFI Annual Conference in Azores*, **2017**, pp. 661-668.

8. Lentjušenkova, O., Lapiņa, I. The transformation of the organizations' intellectual capital: from resource to capital, *Journal of Intellectual Capital*, Volume 17, Issue 4, **2016**, pp. 610-631.

9. Ozoliņš, M., Stensaker, B., Gaile-Sarkane, E., Ivanova, L., Lapiņa, I., Ozoliņa-Ozola, I., Straujuma, A. Institutional attention to European policy agendas: exploring the relevance of instrumental and neo-institutional explanations, *Tertiary Education and Management*, Volume 24, Issue 4, **2018**, pp. 338-350, available at: https://www.tandfonline.com/doi/full/10.1080/13583883.2018.1459820 (accessed 9 February 2019).

10. Parasuraman, A., Zeithaml, V. A., Berry, L. L. SERVQUAL: a multiple item scale for measuring consumer perceptions of services quality, *Journal of Retailing*, Volume 64, Issue 1, **1988**, pp. 12-40.

11. Rossouw, D., Goldman, G. A. Strategic drivers for higher education, *Contemporary Management in Theory and Practice 2014 proceedings of the 26th Annual SAIMS Conference in Vanderbijlpark*, **2014**, pp. 568-579, available at: https://studylib.net/doc/8256176/contemporary-management-in-theory-and-practice (accessed 9 February 2019).

12. *Standards and Guidelines for Quality Assurance in the European Higher Education Area* (ESG), **2015**, Brussels, Belgium, available at: http://bit.ly/2G3D134 (accessed 05/07/2019).

13. Straujuma, A., Lapina, I., Gaile-Sarkane, E., Ozolins, M. Policies, legislation and regulatory compliance governance impact on strategic management of higher education and research institutions in Latvia, *WMSCI 2017 proceedings of the 21st World Multi-Conference on Systemics, Cybernetics and Informatics in Orlando,* Volume 2, **2017**, pp. 69-74.

14. Medne, A.; Lapina, I. Sustainability and Continuous Improvement of Organization: Review of Process-Oriented Performance Indicators. *J. Open Innov. Technol. Mark. Complex.* **2019**, *5*, 49.

10.

Standardization as a Catalyst for Open and Responsible Innovation

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Abstract

Purpose/ Research Question: Standardization, based on scientific and technological development, provides solutions for optimal level of accordance in a wide range of industrial, societal and environmental fields. Analogically to the process of open innovation, the development of standards brings together the knowledge and experience of different stakeholders, resulting in solutions that are relevant and accessible to the general public. Similarly, the concept of responsible innovation requires a variety stakeholders to be involved in innovation development. In the study, the authors identify the links and similarities between standardization and the concepts of open, responsible innovation. The interaction between standards development and the creation of open, responsible innovation is analyzed and as a result a set of characteristics that identify how standardization contributes to open and responsible innovation is provided.

Key Literature Reviews (About 3~5 papers): Although standardization can be described as a set of activities that to some extent unifies products, processes and systems, it is also identified as a driver of innovation and development based on considerations of conformity, safety, quality and ensuring common good of society [1]. The systematization of relevant knowledge of stakeholders through standards development contributes to the fostering of innovation and the growth of economy as it results in the diffusion of technical innovation and best practice [2]. The standards development activities on the international level reveal that standardization coincides with the global industrial development and complements the introduction of innovations on specific areas of the Industry 4.0 such as artificial intelligence, additive manufacturing, unmanned aircraft systems, etc.

Standards are developed following a set of stages including drafting, enquiry and review which can be compared to the innovation process as it also sequential and includes stages of the creation of an outlined concept, detailed design, performing testing, and launch [3]. It is increasingly important to consider the concepts of openness and responsibility in the innovation process as sustainable performance and openness to innovation are important requirements for continuous development [4]. Standards are developed through the cooperation of relevant stakeholders. Analogically, in the concept of responsible innovation it is considered crucial to ensure early stakeholder involvement to increase transparency as well as alignment with societal needs, however, various obstacles for successful engagement of a variety of stakeholders is often identified both in innovation creation and standardization [5]. The concept of open innovation process can be characterized by three archetypes – the outside-in process, the inside-out process and the coupled process, which can also be compared to the process of standards development as it requires the collection of knowledge of interested parties, sharing the outcomes for wider use and coupling these processes to create new deliverables [6] [7]. In the past two years, the deliverables of the technical committee ISO/TC 279 "Innovation management" have introduced standardized vocabulary, guidance on innovation management system implementation and innovation management assessment, as well as tools and methods for innovation partnership and intellectual property management. Through these activities standardization also contributes to the achievement of the United Nations Sustainable Development Goals. The findings of the study demonstrate that both the standardization process itself and its outcomes can be compared to the processes of open and responsible innovation and can also be characterized as a contributor for the achievement of sustainable development and fostering open an responsible innovation.

Design/ Methodology/ Approach: A literature review of scientific publications is performed focusing on the concepts of standardization, open innovation and responsible innovation. The literature review reveals the links, similarities and interrelation between these concepts and their practical implementation. Logical analysis is applied to create groups of common characteristics focusing on different aspects of standardization and the concepts of open, responsible innovation. A model that reveals how the process of standards development correlates with open innovation process archetypes is created.

(Expected) Findings/Results: The study results in a literature review on the concepts of open, responsible innovation and standardization from which a set of aspects that characterize the links and similarities between the concepts is derived. Also, barriers for successful practical implementation of these concepts are identified. As a result, the answer to the research question – how standardization can foster open and responsible innovation – is provided through a set of characterizing factors and a creation of a model which illustrates the correlation between standards development and open innovation process archetypes.

Research limitations/ Implications: Standardization activities are implemented on different levels

regarding various fields of interest. In this study, the authors focus on formal standardization and the general standards development process performed on the international level (i.e. the development of ISO, ISO/IEC standards). The study identifies barriers for stakeholder engagement in the processes of standards development and open, responsible innovation which can be further explored in a practical environment, focusing on specific stakeholder groups.

Keywords: standardization, open innovation, responsible innovation, stakeholder involvement.

Reference

1. Liepiņa, R.; Lapiņa, I.; Mazais, J.; Janauska, J. Innovations, Standards and Quality Management Systems: Analysis of Interrelation. *Proceedings of the 8th European Conference on Innovation and Entrepreneurship, Belgium, Brussels, 19-20 September, 2013. Brussels: Academic Conferences and Publishing International Limited*, **2013**, pp. 723-730.

2. Riillo, C. A. F. Profiles and Motivation of Standardization Players. *International Journal of IT Standards and Standardization Research, 11(2)*, **2013**, pp. 17-33.

3. Silva, L., Bitencourt, C., Faccin, K. and Iakovleva, T. The Role of Stakeholders in the Context of Responsible Innovation to Achieve Sustainable Development Goals: A Meta-Synthesis, *Sustainability 11(6), 1766*, **2019**, pp. 1-25.

4. Medne, A.; Lapiņa, I. Sustainability and Continuous Improvement of Organization: Review of Process-Oriented Performance Indicators, *Journal of Open Innovation: Technology, Market, and Complexity, Vol. 5, No. 3*, **2019,** pp.1-14.

5. van de Poel, I.; Asveld, L.; Flipse, S.; Klaassen, P.; Kwee, Z.; Maia, M.; Mantovani, E.; Nathan, C.; Porcari, A.; Yaghmaei, E. Learning to do responsible innovation in industry: six lessons, *Journal of Responsible Innovation,* **2020**, pp. 1-11.

6. Gassmann, O.; Enkel, E. Towards a Theory of Open Innovation: Three Core Process Archetypes. *R&D management Conference, Lisabon, 21-24 June, 2004,* **2004**, pp. 1-18.

7. Medne, A.; Lapina, I. Sustainability and Continuous Improvement of Organization: Review of Process-Oriented Performance Indicators. *J. Open Innov. Technol. Mark. Complex.* **2019**, *5*, 49.

11.

The role of open innovation in the world of hospitality industry

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Abstract

Purpose/ Research Question: Many scholars highlight the importance of innovation in the hotel Industry with reference to customers, entrepreneurs and human resources (Campo, Díaz, & Yagüe, 2014). Particularly, this paper aims to explore important aspects of innovations and how Italian Hotel industry applies the variables of innovation.

Key Literature Reviews (About 3~5 papers): Many scholars (Schmidt, Cantallops, & Dos Santos, 2008) identify innovation as the effective implantation of information technologies, exploring the link between ICT and the potential benefits for hotels (Hwang et al., 2018; Bea et al., 2017). They find that hotels do not efficiently use ICT since, in the era of social networks, companies exploit the technological tools to be in touch with the network (many-to-many marketing), rather than the single guest (one-to-one marketing).

Other scholars (Sparks, So, & Bradley, 2016; Hua, Morosan, & DeFranco, 2015; Koseoglu, Rahimi, Okumus, & Liu, 2016; Della Corte, 2018) study the role of ICT not only to catch new customers but also for customer retention strategies, since ICT tools can support the managers during and after customer experience. For examples, managers have the opportunity to respond to both positive and negative reviews, giving the right voice to the company vision.

"Innovation, then, is not necessarily the creation of a new technology and can arise more frequently in the expression of entrepreneurial behavior that manifests itself in unexpected ways and unexpected but welcome from the market" (Valdani, 1996). Innovation, and creativity, in this optic, are bound to and require knowledge: this aspect is often misunderstood or skipped in the literature. However, knowledge is important since it helps the euristic process of exploration beside exploitation in innovation and dynamic capabilities can help this process.

This vision requires the adoption of open innovation in the hotel industry, that explains the transition from closed systems to open systems (that are the systems that interact dynamically between them and with the external environment) and that has changed firms‟ strategic paths, more and more based on relationships with other companies in the context of creative management, through the development of common ideas, strategies and policies in processes and services‟ implementation. Moreover, creative ideas and creativity in general are the basis for innovation and can be considered its initial source. The innovation process consists of four phases: research, development, production, marketing where also the creativity is transversal to these phases.

Design/ Methodology/ Approach: The analysis is focused on multiple case studies analysis. Hence, the paper explores three case studies, examining the different strategies of innovation management.

(Expected) Findings/Results: This study gives a relevant contribution both to the theory on the new perspectives on open innovation in hotel industry and to the managerial practice. Firstly, it comes out that open innovation is important in this sector and it cab be the result of interactions with different actors of the industry, customer, local community, etc. This exists not only in operational activities but mainly in the most creative process of product construction.

Research limitations/ Implications: Finally, this paper offers both theoretical and managerial insights that are useful for the strategic planning of hotel industry, underlying the importance of innovation in the creation of highly experiential and customized product.

Keywords: open innovation, hotel industry, Italy.

References

Bae, E. S., Chang, M., Park, E. S., & Kim, D. C. (2017). The effect of Hallyu on tourism in Korea. Journal of Open Innovation: Technology, Market, and Complexity, 3(4), 22.

Campo, S., M. Díaz, A., & J. Yagüe, M. (2014). Hotel innovation and performance in times of crisis. International Journal of Contemporary Hospitality Management, 26(8), 1292-1311.

Della Corte, V. (2018). Innovation through coopetition: Future directions and new challenges. Journal of Open Innovation: Technology, Market, and Complexity, 4(4), 47.

Hua, N., Morosan, C., & DeFranco, A. (2015). The other side of technology adoption: examining the relationships between e-commerce expenses and hotel performance. International Journal of Hospitality Management, 45, 109-120.

Hwang, B., Jun, H., Chang, M., & Kim, D. (2018). Efficiency Analysis of the Royalty System from the Perspective of Open Innovation. Journal of Open Innovation: Technology, Market, and Complexity, 4(3), 22.

Koseoglu, M. A., Rahimi, R., Okumus, F., & Liu, J. (2016). Bibliometric studies in tourism. Annals of Tourism Research, 61, 180-198.

Schmidt, S., Cantallops, A. S., & dos Santos, C. P. (2008). The characteristics of hotel websites and their implications for website effectiveness. International Journal of hospitality management, 27(4), 504-516.

Sparks, B. A., So, K. K. F., & Bradley, G. L. (2016). Responding to negative online reviews: The effects of hotel responses on customer inferences of trust and concern. Tourism Management, 53, 74-85.

Valdani, E. (1996), Strategic marketing: an ability to develop proactive, market and driving value. Etas.

12.

The comedy of commons: Democratization, Participation, and OI with sustainability -Comparative analysis of 3 economies: Jeju Korea, Sorento or Amalpi Italy, and St. Petersburg Russia

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1. Introduction

The venture ecosystems which are treated as successful examples such as Silicon Valley in US, JungKwan Chon in China, Cambridge area in UK et al., have similar characteristics. The members of successful venture ecosystem or regional innovation system treat new technologies, business models, or patents as a kind of commons, and agents in the systems communicate each other with democratic, and mutual participant ways, and arrive at creative open innovations. In addition, platform firms such as Uber, Airbnb etc. which are based on two-side network effects of sharing economy or social economy, that are a kind of common goods, let us think about not the tragedy of common but the comedy of common.

We want to know the success conditions and factors of the common good from diverse capitalist economy for us to apply these at the venture ecosystems, regional innovation ecosystem, or sharing & social platforms which tread new technologies or business models as common goods when people collaborate to commercialize them.

Are there any common or non-common success conditions and factors which can be applied to produce common goods in different economy conditions economy?

If then, what are they?

2. Literature reviews and research framework

2.1. Literature reviews

There are a lot of examples of common goods in capitalist economy for long time from Alpine Switzerland, Traditional common lands Iriaichi in Japan, to Huerta irrigating farm of in Spain (McC, 1972; McKean & Cox, 1982; Robert McC Netting, 1996; R. M. J. B. Netting & resource, 1982; Ostrom, 1990). The theories of collective action, and the commons that developed in the middle of the twentieth century emphasized the difficulty of collective action, and suggested that overexploitation of shard natural resources inevitable(Poteete, Janssen, & Ostrom, 2010; Sandler, 1992). The tragedy of the commons deals explicitly with the challenges of avoiding overexploitation and degradation of a shared natural resources from Hardin's logic to deep-sea fisheries(Gordon, 1954; Hardin, 1968; Scott, 1955).

But, in the specialized conditions such as enough common goods, non-central control, or enough participants of related agents etc., common goods can be new clues as the comedy of commons according to cases from USA, Japan, and Switzerland (Ostrom, 1990). In fact, helping and supporting each other in the history of human has been contributed for the evolution of social institutions and the culture of mankind(Kropotkin, 1914). According to recent researches such as humans' helping each other in a repeated prisoner's dilemma game, and the coevolution of parochial altruism and war in human history etc., human can have the possibilities to use common goods for now usage and future together without the tragedy of common(J.-K. Choi, 2009; J.-K. Choi & Bowles, 2007; J.-K. J. J. o. E. B. Choi & Organization, 2007).

In some case, if market tries to pay price for some value in common goods, or social value, the price could drive out the social value of common goods or public goods(Sandel, 2012, p. 130). New economy with high network externality, incomplete contracts etc., traditional 3 factors of economy such as land, labor, and capital, can be substituted by brain calculation, information, reputation, with the expansion of common goods economy(Bowles, Edwards, & Roosevelt, 2005, p. 477). As the appearance of capitalism without capital, intangible investments such as software, databases, R&D, creating entertainment, design, training, market research and branding, business process reengineering etc. are appearing with new issues such as intangible scalability, intangible

sunk cost, intangible spillovers which have relations or similarities with common goods, collaboration, or open innovation(Haskel & Westlake, 2018). In fact, the commercialization bias of the new commodity fetishism produces social limits to growth specially in the traditional common goods, and new common goods which are from information and networking (Hirsch, 2005).

By the way, the area of common goods are from non-excludable and rival in consumption. But the appearance of new economy, so to say capitalism without capital, new common good area are appearing (Figure 1).

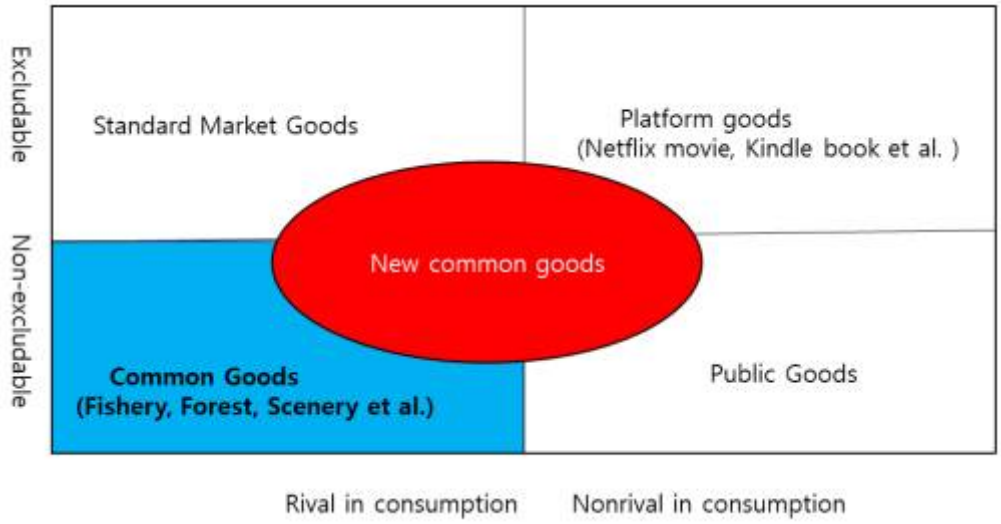

Figure 1. Research Framework

Source (Krugman & Wells, 2012, p. 461) based developed by authors

A Need for Co-Evolution between Technological Innovations and Social Innovations(P. K. J. J. o. O. I. T. Choi, Market, & Complexity, 2020)

An Investigation on Responsible Innovation in the Emerging Shared Bicycle Industry: Case Study of a Chinese Firm(Liu, Ma, Zhu, Ji, & Complexity, 2019)

Basic Income with High Open Innovation Dynamics: The Way to the Entrepreneurial State(Yun, Park, Hahm, Kim, & Complexity, 2019)

2.2. Research Framework

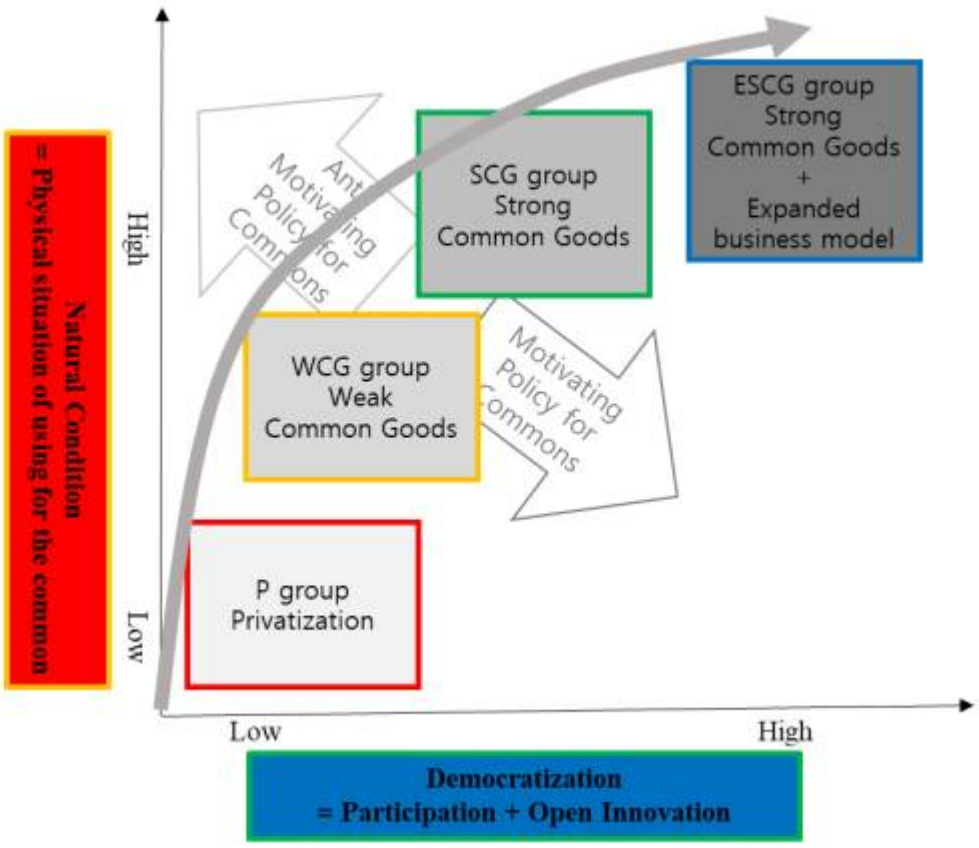

Figure 2. Research framework; diverse evolution direction of common goods

The directions of commons goods can have several candidates such as; Privatization; Maintaining weak common goods; Maintaining strong common goods; or Maintaining strong common goods and expanding business models (Figure 2) according to several cases; common good meadow and forest of Japan, and Switzerland; watering institutions and systems of Huerta areas, Spain; watering community of Ilocanos, Philippine; the logic of the water-right game of Metropolitan water district case of USA. etc.(Coward, 1985; Maass & Anderson, 1978; McKean & Cox, 1982; Robert M Netting & Netting, 1981; Ostrom, 1990, p. 202).

Natural conditions of common goods for the original usage for example, fishing, sea farming, cattle breeding, watering or irrigating etc. decides the evolution direction of common goods even though the detail of natural conditions of common goods are very diverse, and changeable according to social-economical context(Berkes, 1986; Blomquist, 1989).

And, the participating volume, and democratization of the participating for the usage of common goods are deciding the maintenance of the value of common goods, and the expansion of the usage value of the common goods, so to say open innovation and expanding business models. Autonomous organization for autonomous management of common goods will be the best example of participation, democratization, and open innovation of common goods(Ostrom & Walker, 1991). From collective action theory for public goods such as orthodox theories of pressure groups, orthodox theories of state and class etc. to autonomous management theory of common goods by Ostrom, a lot of theories are appearing about the participation of management of common goods(Olson, 2009; Ostrom, 1990). Maybe there are diverse details of participation, democratization, and open innovation according to situations and belonging economy conditions.

In several cases, the intentional or non-intentional policies of governments are giving effects to the direction of common goods such as California State' watering intervention, Turkey government's intervention in the near fish farm etc.

2.3. Research Scope and Method

2.3.1. Research Scope

- Kora Jesu island; 10 common good near sea fish farms, 10 common good farms (KwonHoo & Kwon SangCheul, 2016)

- Landscapes of Amalfi, or Sorento which are interpreted as 'common goods' in natural, environmental, human, social, infrastructural, cultural, and financial aspects(Fusco Girard, 2013; L. F. J. B. B. D. C. C. B. Girard, 2013; L. F. J. B. E. Girard, 2014).

- Najing common good fish farms, farms, watering institutions, or forestry (Shen & Shen, 2019; Tian & Liu, 2019; Zhang, Zheng, Zhang, Hu, & Health, 2020)

2.3.2. Research Method

- Semi structured questionnaire based deep interview

- Participant observation

- Main Questionnaire: Process of decision making, Participation of people in decision, Maintain and distribution of the property of the common goods, et al.

<Appendix 1> Semi Structured questionnaire

<Appendix 2> Focal points of Participant observation

<Reference>

Berkes, F. J. M. p. (1986). Local-level management and the commons problem: A comparative study of Turkish

coastal fisheries. 10(3), 215-229.

Blomquist, W. (1989). The performance of groundwater management: volume 8, the Mojave River Basin. Paper

presented at the Workshop in Political Theory and Policy Analysis. Bloomington: Indiana University. Bowles, S., Edwards, R., & Roosevelt, F. (2005). Understanding capitalism: Harper Collins New York.

Choi, J.-K. (2009). The Appearance of Altruistic Human: PURIWA IPARI(In Korean Language).

Choi, J.-K., & Bowles, S. J. s. (2007). The coevolution of parochial altruism and war. 318(5850), 636-640.

Choi, J.-K. J. J. o. E. B., & Organization. (2007). Trembles may support cooperation in a repeated prisoner's dilemma game. 63(3), 384-393.

Choi, P. K. J. J. o. O. I. T., Market,, & Complexity. (2020). A Need for Co-Evolution between Technological Innovations and Social Innovations. 6(3), 54.

Coward, E. W. J. P. p. f. s. v. i. r. d. (1985). Technical and social change in currently irrigated regions: rules, roles and rehabilitation. 27-51.

Fusco Girard, L. J. S. (2013). Toward a smart sustainable development of port cities/areas: The role of the “Historic Urban Landscape” approach. 5(10), 4329-4348.

Girard, L. F. J. B. B. D. C. C. B. (2013). Creative cities: the challenge of “humanization” in the city development.

13(1), 9-33.

Girard, L. F. J. B. E. (2014). Creative initiatives in small cities management: The landscape as

an engine for local

development. 40(4), 475-496.

Gordon, H. S. (1954). The economic theory of a common-property resource: the fishery. In Classic papers in natural resource economics (pp. 178-203): Springer.

Hardin, G. J. S. (1968). Garrett Hardin: The Tragedy of the Commons. 162, 1243-1248.

Haskel, J., & Westlake, S. (2018). Capitalism without capital: The rise of the intangible economy: Princeton

University Press.

Hirsch, F. (2005). Social limits to growth: Routledge.

Kropotkin, P. (1914). Mutual aid: A factor of evolution: Courier Corporation.

Krugman, P., & Wells, R. (2012). Microeconomics. In: Worth Publishers.

KwonHoo, K., & Kwon SangCheul, K. R. a. G. A. J. (2016). Community based Natural Environment Sustainaility Usage Method: Jenu Island Woman Diver's Common Good Management Case(In Korean) 22(1), 49-63.

Liu, Z., Ma, L., Zhu, Y., Ji, W. J. J. o. O. I. T., Market,, & Complexity. (2019). An investigation on responsible

innovation in the emerging shared bicycle industry: Case study of a Chinese firm. 5(3), 42.

Maass, A., & Anderson, R. L. (1978). ... and the desert shall rejoice: conflict, growth, and justice in arid environments: MIT press.

McC, R. J. A. Q. (1972). Of men and meadows: strategies of alpine land use. 132-144.

McKean, M. A., & Cox, T. R. J. E. R. E. (1982). The Japanese experience with scarcity: Management of traditional common lands. 6(2), 63-91.

Netting, R. M. (1996). What Alpine peasants have in common: Observations on communal tenure in a Swiss

village. In Case studies in human ecology (pp. 219-231): Springer.

Netting, R. M., & Netting, R. M. (1981). Balancing on an Alp: ecological change and continuity in a Swiss

mountain community: CUP Archive.

Netting, R. M. J. B., & resource, s. s. r. A. n. (1982). Territory, property, and tenure. 446-502.

Olson, M. (2009). The Logic of Collective Action: Public Goods and the Theory of Groups, Second Printing with a New Preface and Appendix (Vol. 124): Harvard University Press.

Ostrom, E. (1990). Governing the commons: The evolution of institutions for collective action: Cambridge university press.

Ostrom, E., & Walker, J. J. L. r. i. p. e. (1991). Communication in a commons: cooperation without external enforcement. 287-322.

Poteete, A. R., Janssen, M. A., & Ostrom, E. (2010). Working together: collective action, the commons, and

multiple methods in practice: Princeton University Press.

Sandel, M. J. (2012). What money can't buy: the moral limits of markets: Macmillan.

Sandler, T. (1992). Collective action: Theory and applications: University of Michigan Press.

Scott, A. J. J. o. p. E. (1955). The fishery: the objectives of sole ownership. 63(2), 116-124.

Shen, M., & Shen, J. J. J. o. R. S. (2019). State-led commodification of rural China and the sustainable provision

of public goods in question: a case study of Tangjiajia, Nanjing.

Tian, L., & Liu, N. C. J. H. E. (2019). Rethinking higher education in China as a common good. 77(4), 623-640. Yun, J. J., Park, K., Hahm, S. D., Kim, D. J. J. o. O. I. T., Market,, & Complexity. (2019). Basic income with high

open innovation dynamics: The way to the entrepreneurial state. 5(3), 41.

Zhang, R., Zheng, H., Zhang, H., Hu, F. J. I. J. o. E. R., & Health, P. (2020). Study on the Influence of Social Capital on Farmers' Participation in Rural Domestic Sewage Treatment in Nanjing, China. 17(7), 2479.

13.

Two-stage cluster model for analysis of innovation factors

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Abstract

Purpose/ Research Question: This article aims to highlight various methods and approaches to grouping countries, according to the behavior of their innovation factors: GDP, inflation and unemployment are the most important indicators of the economic and social policies of states, allowing them to be evaluated and models built.

The search for interrelationships of the main innovation metrics is one of the important tasks of many branches of economics and political sciences. In view of the obvious and, perhaps, the greatest significance, models and studies on the relationship between GDP, inflation and unemployment are traditionally of particular interest. Despite the high social significance of the phenomenon under study and many works on this topic, researchers have not yet come to a general conclusion either about the ranking of the significance of the relationship, or about the universality of models for temporal and country differences. Typically, research involves 2 factors: So, the following became classical for many works: the Phillips model - assumes an inverse relationship between inflation and unemployment, and the Okun model - revealing the relationship between GDP and unemployment; there are many other views, some of which will be considered in the literature review part.

Key Literature Reviews (About 3~5 papers): The theoretical ideas laid the foundation for this work. The pattern was found in their works by Paul Samuelson [1]. Their revision was to assess the impact not of changes in wages, but of inflation in general, on the unemployment rate, the ratio of which also turned out to be inversely proportional. These studies became the basis for searching for stable relationships between inflation and unemployment in different countries, and for conducting a policy based on the results of this connection, which is especially characteristic of politics.

In fact, his observation cannot be called a strict economic law due to many statistical errors. Despite this, in general, the idea that the change in actual GDP compared to the expected one is strongly correlated with the change in inflation, has gained widespread use in simple models of economic analysis. So, with a decrease in unemployment, the multiplier effect caused by the circulation of workers' money decreases, the unemployed can affect the type of unemployment (stop looking for work), labor productivity can fall [2-4].

GDP and inflation are linked only in the short term, without significant correlation over long periods of time [4]. For European countries, inflation and economic growth are also linked in the medium term. Prior to this study, a similar trend in the behavior of innovation indicators in OECD countries.

Some authors have argued the existence of a relationship between the indicators under consideration, regardless of the time interval.

Design/ Methodology/ Approach: This article will offer a two-stage solution to the problem of grouping countries with similar patterns of behavior of these innovation factors. For this, it is supposed to classify countries step by step using several algorithms and visually depict the similarity of the behavior patterns of their indicators. The central hypothesis in this approach is the assumption that GDP, inflation and unemployment reflect different aspects of the life of society, state policy and economic processes, therefore finding their relationship can become a new predictive innovation tool or the basis for identifying blocks of countries according to fundamentally new parameters.

(Expected) Findings/Results: The key prerequisite for explaining this statement is the high significance and complex nature of the borrowed factors of the model. In particular, the origin of inflation has no clear concept. Monetarists associate it with monetary policy and other monetary factors. Various studies have found that inflation is associated with changes in government spending / revenues, changes in the money supply in circulation, structural changes in the market (actions of monopolies and trade unions), changes in production processes, political factors and many other phenomena. In view of this, we can conclude that inflation in sufficient depth for modeling reflects many political aspects of the actions of government regulators and individual firms, as well as many other processes. In a similar way, unemployment was chosen for the analysis, the level of which indicates a huge variety of all kinds of social, socio-economic and technological processes. For example, it reflects the following: structural changes in the economy, the state of the current economic cycle, the level of education and technology development, public sentiment, and much more. GDP as a concluding feature of the model was selected due to the economic and statistical features of this indicator. Its importance in reflecting economic processes cannot be overstated, since it shows the production of all goods and services for a certain period of time, and statistically, the choice of this parameter is due to its fundamental nature and relative stability among other indicators, all other things being equal.

The key stages in the primary data processing were: defining the type of the studied indicators and reducing the number of features. To solve the first problem, we had to resort to the definitions of indicators. To reflect precisely the relationship of changes, it was necessary to translate the unemployment and GDP indicators into indicators of their annual change (increase / decrease). For this, the base year was calculated as a moving average of the increments:

$$\Delta_0 = \frac{\Delta_1 + \Delta_2}{2} \qquad (1)$$

The rest of the years are calculated as absolute growth:

$$\Delta = y_n - y_{n-1} \qquad (2)$$

Where Δ_n is the increase in the indicator in the n-th year, and y_n is the value of the characteristic in the year n.

The task was also to reduce the number of features, since 115 countries were selected to compile the model, which are observations for the algorithm. Each of the countries initially had 90 signs: indicators of GDP, inflation and unemployment for 30 years from 1990 to 2019 inclusive. The ratio of the number of features to observations was excessive (90/115 is not suitable for the correct operation of machine learning algorithms without a teacher). Hence, after a rough estimate and calculating the required number of samples, 9 features were compiled for each observation. For this, according to Juglar's observations, a table of the average level of indicators was formed with a step of 10 years for each of the countries for the period 1990-2019. In general, this and subsequent stages of data processing and model creation can be displayed graphically:

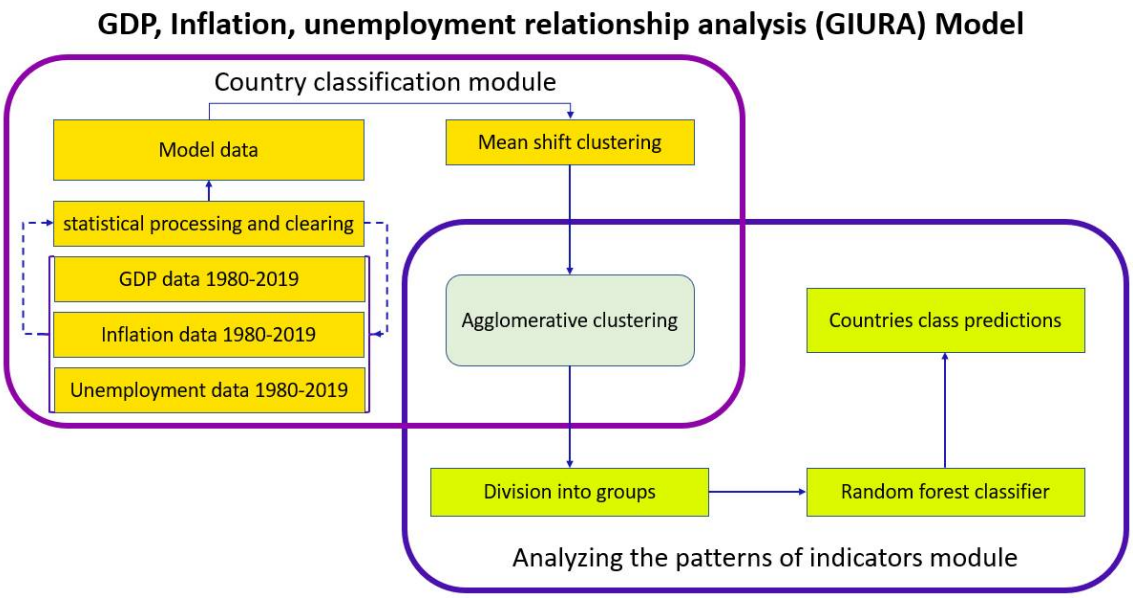

Fig. 1. GUIRA model

Source: author

As can be seen from the image, after the described processing processes, the first stage of applying machine learning follows, in particular, the clustering algorithm for shifting to the mean. The advantage of this approach is that it does not require the input of a certain set of classes or their form, that is, it independently determines the number of formed groups, which is why it was chosen for the primary grouping.

The principle of operation of this algorithm is to estimate the kernel density. For explanation, assume that there is a dataset n of data from points {ui} in d-dimensional space. Let the kernel K

with the bandwidth h be selected. Then, together with the kernel function, they form an estimate of the kernel density distribution:

$$f_k(u) = \frac{1}{nh^d} \sum_{i=1}^{n} k\left(\frac{u-u_i}{h}\right) \qquad (3)$$

The designations described in the previous paragraph remain the same for the subsequent formulas of this section.

Directly, the shift-to-mean algorithm uses this estimate to shift the suspended particles in the direction of higher density. The kernel function must meet the conditions:

$$\int k(u)\,\mathrm{d}(u) = 1 \qquad (4)$$

$$k(u) = k(|u|) \quad (5)$$

Of course, having obtained such a result, one could refer to the exceptional fidelity of the Friedman-Phelps concept, which assumes the absence of long-term strength in the Phillips curve. In addition, their conclusion is quite consistent with historical logic and a departure from Keynesian ideas, but even in this case, everything is not completely clear. They tried to question Phillips' concept, but used methods similar to him, which did not allow to overcome the fundamental discrepancy between the object and research methods. In addition, the result achieved by them can be refuted even by empirical methods, for example, by looking again at the data of the 7th group from the previous section, where Phillips' ideas remain partially true in the long run. Economist Robert Lucas also developed the idea of the final determination of the relationship of the factors under consideration. He has already changed some methodological approaches, and began to study inflation expectations in the economy, as a result of which he came to the conclusion of a sufficiently high explanatory power of the Phillips model in the short term, but the need for significant refinement and customization for the purpose of the study when trying to apply it over a long period of time.

This work agrees with the last conclusion to a greater extent. The key differences of this work from the existing ones are approaches to data preprocessing and variability of methods. This has been described in greater detail in the Methods section, but when compared with other studies it is worth clarifying this again. Thus, the novelty of the methodology consists in combining different economic doctrines. In this case, classical macroeconomic views were checked, and to assess the set goal, the data were processed according to some methods of marginalists, in particular, to analyze the behavior of data in dynamics, the idea of assessing the absolute change in indicators over periods of time was used. This makes it possible to accurately take into account the behavior of factors in the model and not discriminate in scale.

The disadvantage of the techniques used in this article may be the complexity of interpretation for

practical purposes. For further studies using similar methods, it will be useful to compare the methods used and the results obtained with those already implemented. There may also arise the problem of the absence of a vector of goals necessary for the vast majority of machine learning models, so you can use combinations of algorithms implemented in other studies, for example, the model proposed in this work, or other others consistent with the study.

Research limitations/ Implications: Thus, this paper argues that GDP, inflation and unemployment have several different communication models, and these models are suitable for some blocks of countries. To test this assumption, the article used clustering algorithms based on machine learning, and for further practical classification and predictive model, models were compiled using the algorithm of random decision trees. For future more accurate models and classifications, researchers are expected to select consistent metrics that encompass fundamental patterns explored by the social sciences. This approach slightly complicates the models and concepts themselves, but allows to significantly improve the quality of analytical groups and the accuracy of predictive calculations for different blocks of states.

In this article, based on mathematical approaches in economic modeling with elements of machine learning in the python language, a country clustering model is proposed. This allows us to state at least three areas of the contribution of work to the development of the body of available knowledge in the social sciences. Firstly, for the analysis it is supposed to use changes, that is, increments over equal periods of time, data, and not directly their levels. This allows you to find non-obvious similarities, regardless of the size and current development of the country. Secondly, the created econometric model allows building regression models and forecasts for groups of countries on its basis, or using similar ideas to create other classifications. Thirdly, the main achievement of the work can be considered the proposal to change the established ideas of groupings of countries by blocs.

Keywords: GDP; inflation; unemployment; clustering algorithms; random forest; country classification.

References

1. Garciga, C and Knotek, E. S. (2019). Forecasting GDP growth with NIPA aggregates: In search of core GDP. International Journal of Forecasting, 35(4), 1814-1828, https://doi.org/10.1016/j.ijforecast.2019.03.024

2. Kim, Y.; Lee, M. Typology and Unified Model of the Sharing Economy in Open Innovation Dynamics. J. Open Innov. Technol. Mark. Complex. 2019, 5, 102.

3. Tajudeen, F.P.; Jaafar, N.I.; Sulaiman, A. External Technology Acquisition and External Technology Exploitation: The Difference of Open Innovation Effects. J. Open Innov. Technol. Mark. Complex. 2019, 5, 97.

4. Choi, B.-G.; Jeong, E.; Kim, S.-W. Multiple Security Certification System between Blockchain Based Terminal and Internet of Things Device: Implication for Open Innovation. J. Open Innov. Technol. Mark. Complex. 2019, 5, 87.

14.

Blockchain innovation in stock exchanges: Evidence from Russia

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Abstract

Purpose/ Research Question: Commercial startups in Russia in the sphere of financial services technologies they are developing digital apps for various purposes goals for which used public infrastructure of the block chain, basically it Bitcoin and Ethereum;
In present time formed industry standards consortia for research purposes research and development private, allowed blockchain for industry-specific corporate clients solutions.
Especially great interest to distributed ones user reports in the financial sector: for example, R3 CEV, one of the largest consortia from new York, who is engaged in R & d for financial institutions with the blockchain, includes more than 100 members, including banks, regulators and trading platforms associations, and the consortium with an open window source code Hyperledger includes more than 170 varieties organizations.
Key Literature Reviews (About 3~5 papers): First of all, cross-border area payments and transfers. The small and medium enterprise in developing countries face with uncertainty, high costs and long delays in the implementation interbank cross-border payments now time usually are through the network correspondent banks or suppliers remittances without Central clearing system.
Cross-border payments for correspondent services Bank account channels are restricted working hours banks and are taxed Commission for transactions in three different ways points of the process: fees charged sending company by an organization [5].
Non-Bank accounts players like as operators money transfers, for example, Western Union and others developed own data structures, providing for preliminary financing in Agency offices institutions, to ensure faster expenditures funds and periodic maintenance calculation of aggregate amounts. Connections between financial institutions, non-Bank account payment services and operators promoted efficiency implemented payments. Topics however, in this case sector

innovations developed by not so active, and, in particular, fees in a foreign currency the currency is still the same make up significant part of commissions for cash payments transfers-about 20% of the total cost.

Creating distributed network for cross-currency calculations, which replaces correspondent Bank network technology distributed registers can to eliminate disadvantages in the existing system and will give the opportunity for significant reduction costs, especially to cross-border interbank transaction. Reducing the estimated costs spending and boosting efficiency interbank payments and cross-border ones transfers, technology distributed registries can potentially help more information the price of cash transfers. Technology distributed registries also can provide new approaches to maintain Bank accounts operations with correspondents, which potentially they may be part of the structure solutions for Troubleshooting risk factors.

Second, digital systems identifications. Worldwide 18% of persons who do not have banking services that link on the absence of documentation, related to ID card personality, in as one of the reasons why which wasn't there implemented banking maintenance. Technology distributed registries can to be used for recording and document storage, related to ID card personality, such as evidence birth certificate and evidence about marriage, as well as operation history, ownership rights on the ground or medical services entries are as follows in such a way that it was safe and it worked verification. One among the advantages distributed registries are the fact that this one technology makes it possible creating a system, where personal data the data may belong separate individuals, and not appropriate state owned bodies. In some cases variations individuals they can decide, what parts its digital features personal information they may be available for transfers to third parties individuals.

Third, the asset registers. Incomplete structure secured transactions and the absence of reliable reports assets (including among the reports movable assets) they mean that absence confirmations security features it can become serious an obstacle to get eligibility to receive credit rating of the company in many countries. Only two billion man in the world have a legitimate, effective and public status in relation to its own control over the asset. Some economists evaluate the cost of this "dead capital" b 9.3 trillion dollars per month worldwide settlement.

Design/ Methodology/ Approach:

It's connected with the fact that the nodes in a distributed system ad networks have possibility forced perform contract by way of execution options the code. Execution smart contract implemented for the following the algorithm:

1. Buyer: together with by the issuing Bank create an email account letter of credit, guaranteeing agent payment if the order was completed.
2. Seller: together with by a consulting Bank collect documents with an indication specific features shipments and make up invoice number.
3. Cargo: loaded to the ship.

4. Inspector (customs office): checks it quality and quantity product and service certificates that are being added to the smart contract.
5. Vessel: Agent on the ship issues a bill of lading, which details cargo and used as a receipt, and the certificate origin.
6. Shipment: oil is being sent to your destination. Documents checked smart contract for compliance and reliability.
7. Status and payment: if the documents will be recognized appropriate, that name the product is passed to the buyer, and payment is made to the seller. All documents and legal records ownership added to the smart contract in immutable files "blocks".

(Expected) Findings/Results:

For the decade technology distributed accounting system books and blockchain significantly expanded in functionality and difficulties, to offer solutions for various industries, including financial sector. Originally understanding technologies distributed accounting system books were limited computer scientists and a few curious by people because of their complexities. However, with apps in the field of Finance and other areas, exists widespread interest in the technology distributed books. Some Central offices banks in cooperation with others institutions they did experimental data projects for studying and understanding technologies distributed accounting system books and studies potential customers benefits for them operations and financial institutions systems. Until now most of the time these projects they wore an experimental one character, so that explore viability carrying out interbank payments settlements, settlements digital assets and tokens and cross-border payments via technological features platforms distributed accounting system books with functional features existing one systems. Important note that most of them these Central ones no banks yet expressed an intention to expand into production applications, based on technology distributed accounting system books. Even in the in the case of a digital one currency of the Central Bank Riksbank, in particular, stated that technology distributed accounting system books in her current collection this is not an option immature for usage e-the crown. However less than, such projects with them resulting advantages expand features Central banks and regulatory authorities management bodies development infrastructure financial the market based on technology distributed accounting system books. It is also allows you to Central banks should provide productive guide for startups and institutions, because they are they are starting to implement it new technologies to ensure effective ones and effective ones problem solutions business. In Indian context growing support from the side Reserve Bank of India and governments India in relation to innovation and new technologies using regulatory information sandbox games and various other schemes will pave the way for the new economy, enriched technologically oriented by pulse growth.

On figures 1-2 reflected the dynamics of change specific gravity profitable and losing credit associations the analysis of which allows to conclude on a trend the growth in the number losing credit organizations – even when it is enlarged Bank account sectors.

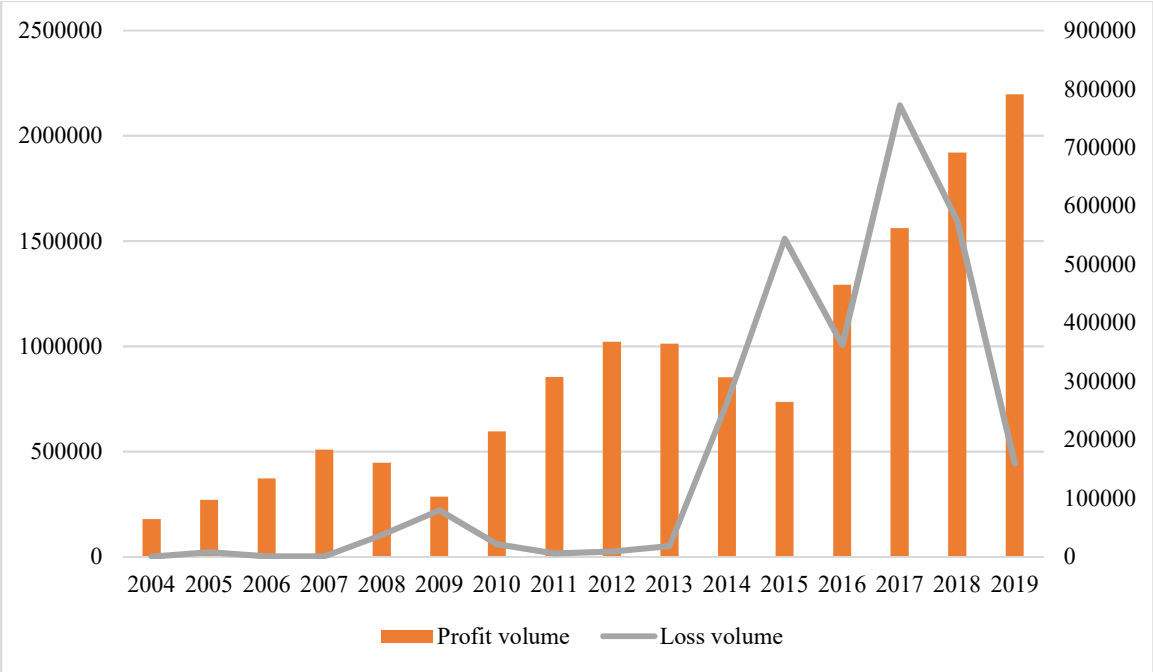

Figure 1. Banks profits and losses in 2004-2019 years, mln RUR.

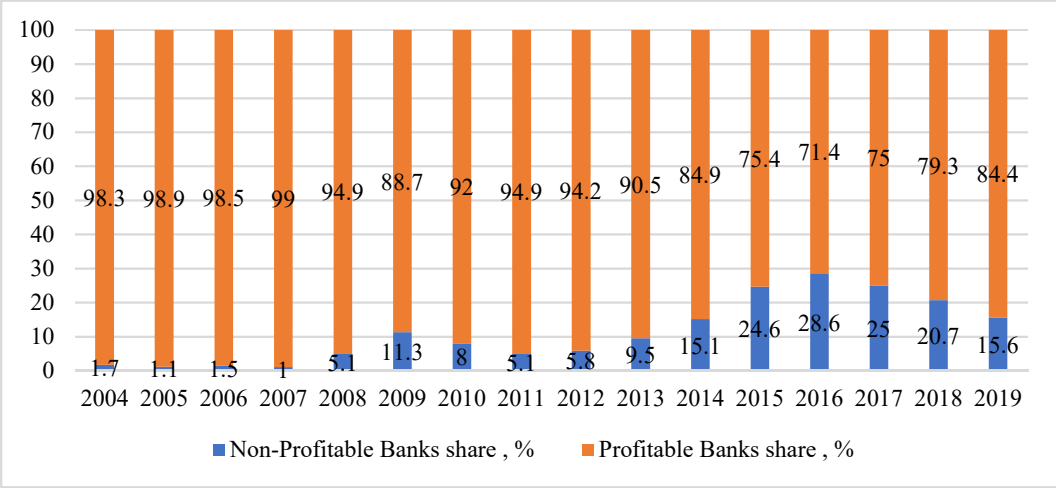

Figure 2. Banks, who had a profit and loss in 2004-2019.

So, we see that in 2004, the share of loss-making companies credit cards organizations why 1.7 of the total quantities – if available foreign companies banks, banks, controlled entities large industrial enterprises businesses, while cleared market since 2014, it has been demonstrating share of loss-making companies credit cards organizations at a level greater than 15%.

On figure 3 shows the dynamics efficiency activities insurance companies organizations for 2005-2018 Noted size growth insurance bonuses per person population slightly more than double

that – from 4 to 10 thousand rubles on average, at that time as of capital return insurance companies organizations growing, but the attitude the amount of data collected insurance companies premiums to GDP abbreviated (short tempo). At the same time coefficient payments to insurance companies premiums are unstable - increases in 2010-2011 and is going on the decline by 2019, what characterizes market as a whole relative stable.

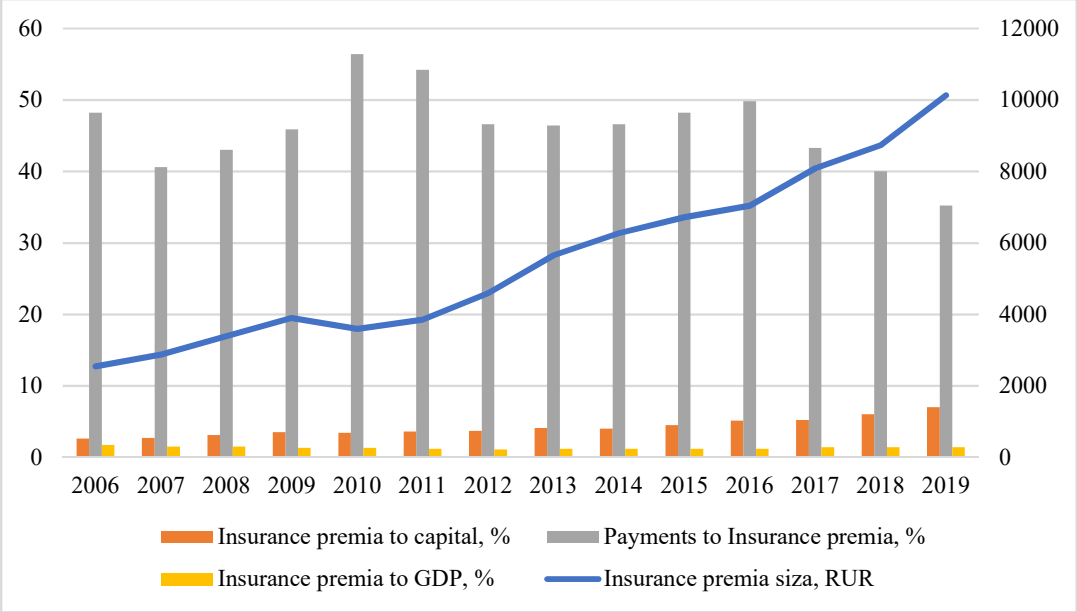

Figure 3. Main features results activities insurance organizations in 2006-2019

On figure 4 shows the information on bankruptcy cases credit cards organizations by procedures bankruptcy cases. Noted long-term growth of the number credit cards organizations, passing students procedure forced liquidation, abbreviation credit cards organizations, passing students procedure bankruptcy cases in 2016-2019, and stable low quantity organizations, passing students procedure voluntary liquidation.

The decision on forced the elimination of accepted in relation to credit organization which are observed signs of bankruptcy (i.e., if the credit the organization unable meet requirements creditors for fourteen days and cost its assets insufficient for performance of its liabilities, there are signs of conformity organization to review it license).

Bankruptcy can be implemented in relation to credit card organizations, if it is not in the state satisfy requirements creditors during the fourteen years old days and cost its assets insufficient for execution its obligations.

Research limitations/ Implications: Thus, this paper argues transactions in digital form currencies on the site based on distributed data registries, such as usually irreversible, what causes it questions

about mechanisms monitoring and resolution disputes. Deposits, stored data in non-Fiat currencies digital currencies. Currently time also not covered insurance deposits, for example Federal Corporation on insurance deposits in USA and law enforcement agencies authorities don't track fraud cases with the use of digital currencies systematically.

Cost digital currencies defined by demand and offer and so it can demonstrate significant fluctuations that does such things currencies are unusable for accumulation cost, in rubles the difference from paper currencies. Discussions about digital currencies assume existence complete ecosystem, in which this digital currency already wide accepted, and, therefore, no need convert digital currency to a Fiat currency. This, however, it doesn't reflect yet reality for large companies population groups in most cases countries today.

Keywords: banks; insurance; financial innovation, financial markets, capitalization.

References

1. Kim, Y.; Lee, M. Typology and Unified Model of the Sharing Economy in Open Innovation Dynamics. J. Open Innov. Technol. Mark. Complex. 2019, 5, 102.
2. Tajudeen, F.P.; Jaafar, N.I.; Sulaiman, A. External Technology Acquisition and External Technology Exploitation: The Difference of Open Innovation Effects. J. Open Innov. Technol. Mark. Complex. 2019, 5, 97.
3. Choi, B.-G.; Jeong, E.; Kim, S.-W. Multiple Security Certification System between Blockchain Based Terminal and Internet of Things Device: Implication for Open Innovation. J. Open Innov. Technol. Mark. Complex. 2019, 5, 87.4.
4. Geurts, P. (2001). Pattern extraction for time series classification. Principles of data mining and know ledge discovery. Springer. 115-127.
5. Gavin Tsang, Jingjing Deng, Xianghua Xie, (2018). Recurrent Neural Networks for Financial Time-Series Modelling. 892-897. 10.1109/ICPR.2018.8545666.

15.

Will robots take your job? The workers' point of view

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Currently, we are experiencing various trends: climate change, demographic contraction, globalization and the spread of digitalization and among them the spread of Corona virus has altered the traditional work organization raising question on the role of technology and the place of work. Indeed, in times of Covid-19, the opportunity to work from home (hereinafter called WFH) became of great importance since it allows employees to continue working and thus receiving wages, employers to keep producing services and revenues, and overall limits infection spread risk and pandemic recessive impacts.

Thus, the aim of the paper is first to understand to what extent perceived (affective and cognitive) job insecurity is affected by the technological change represented by innovation (the introduction of technological innovation for the production and for the process) and automation (the introduction of robots specifically able to perform human tasks; secondly, to understand the impact of the attitude towards working from home on Job Insecurity vis-à-vis technologies. We fill the gap of the current sociological literature, merging the 2018 Survey on Participation, Labour, Unemployment (PLUS) with the 2013 wave of the Italian Sample Survey on Professions (ICP), managed by the National Institute for the Analysis of Public Policies (Inapp). To the best of our knowledge our article is the first attempt to estimate, within the Italian workforce, the association between workers' perceived job insecurity and technological change, as well the first research that investigate the intermediate effect of WFH on the relation between technologies and job insecurity.

Three questions are relevant here: Are workers afraid of losing their jobs due to the introduction of innovations? Is job insecurity linked to the introduction of any technology or only to innovations explicitly aimed at carrying out tasks that were previously carried out by human beings? Is there any difference between affective and cognitive job insecurity?

Then, the second part is addressed to answering the question whether the attitude towards working from home influence the relationship between job insecurity and the introduction of technologies.

For checking the robustness of the results: first, we employ several specifications of the model, by including individual characteristic, job characteristics and firm characteristics. Then, we apply the specification both for 'affective' and 'cognitive' job insecurity. We also control for routinary tasks and working from home attitude.

The result of the robustness checks is that the link between job insecurity and innovation and automation remains significant and it holds for both affective and cognitive job insecurity. Thus, we consider results from our models strong and consistent. In particular, job insecurity is negatively correlated to the introduction of technological innovations, this is due to the fact that companies that innovate usually are the most competitive and the ones that invest more on workers training and on welfare benefits. On the other hand, job insecurity increased among workers when companies introduce robots specifically introduced for substituting human tasks. Moreover, when we control by attitude towards working from home, the level of job insecurity vis-à-vis automation decreases when workers are less likely to work from home and increases for workers who are more likely to work from home.

16.

Productivity-enhancing technologies, artificial intelligence and jobs: A Bayesian multilevel model for Portugal

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Abstract

Purpose:

The average growth rate of the Portuguese economy has been steadily decreasing during the twenty-first century. This deceleration is essentially the consequence of the stagnation of aggregate productivity. Artificial intelligence (AI), with its many applications, is seen as a solution to the productivity slowdown and the means to increase potential GDP. But rapid technological progress associated with AI has promoted the automation of many different types of tasks. The current prospects for the automation of tasks indicate that automation will affect many sectors of the economy, including those where non-manual workers are predominant. The fear that workers will be deprived of jobs because of automation has thus returned. In this study we examine the possible impact of AI, through productivity, on sectoral employment in Portugal, taking into account the role of demand.

Key Literature Reviews:

The accelerated automation of tasks previously performed by workers has been raising concerns that new technologies will replace labour – a phenomenon designated by Autor (2014) as automation anxiety. The advent of AI enables automation to extend from routine and easily codifiable tasks to more complex tasks, namely tasks requiring prediction capabilities. Trajtenberg (2019) classifies AI as the new General Purpose Technology (GPT) and expects AI to have a

substantial negative impact on employment. But advances in automation do not necessarily lead to job losses because of macroeconomic feedback mechanisms that may contribute to the stabilization of, or even to increases in, employment (Arntz et al., 2016; Autor and Salomons (2018), Gregory et al. (2018), Gries and Naudé (2018)). Bessen (2019; 2020) argues that the impact of AI on an industry's employment will be positive if the demand for the industry's good is elastic with respect to the price. Jobs in mature industries (where demand is inelastic) should therefore be at a greater risk of destruction by AI.

Methodology:

We present a theoretical framework that predicts that the impact of AI will depend on the response of labour demand to two opposing forces: less labour is required to produce the same output, and more output is demanded because of lower production costs brought about by higher productivity. We take this model to the data, on a sample containing 32 industries in the Portuguese economy over the period 1995-2018. We adopt a Bayesian approach, through a multilevel model of the elasticity of employment with respect to productivity.

Results:

Our estimates of the industry-level elasticities are all negative and similar across sectors (around -0.23), suggesting, somewhat surprisingly, that the results apply to both traditional sectors where demand is satiated and that employ less skilled workers involved in routine tasks, such as agriculture, construction, food or textile industries, and to modern sectors that employ skilled workers and where the potential for complementarities with AI technologies is higher, such as financial services, education, and health.

Research limitations:

The analysis carried out does not allow for a direct estimate of the impact of AI on jobs. Furthermore, the diffusion of AI technologies through the economy may involve complex processes of restructuration that may take considerable time. Therefore, a lapse of time may exist between the introduction of AI technologies and its effects on productivity and employment and these effects may not be reflected in our estimates.

Keywords: artificial intelligence, automation, productivity, demand, employment, Portugal, Bayesian econometrics, multilevel modelling.

References

Arntz M, Gregory T and Zierahn U (2016) The Risk of Automation for Jobs in OECD Countries. OECD

Social, Employment and Migration Working Papers No. 189.

Autor D (2014) Polanyi's Paradox and the Shape of Employment Growth. NBER Working Paper No. 20485.

Autor D and Salomons A (2018) Is Automation Labor Share–Displacing? Productivity Growth, Employment, and the Labor Share. Brookings Papers on Economic Activity SPRING: 1-63

Bessen J (2019) Artificial Intelligence and Jobs: The Role of Demand. In: Agrawal A, Gans J and Goldfarb A (eds) The Economics of Artificial Intelligence: An Agenda. University of Chicago Press, pp.291 - 307.

Bessen J (2020) Automation and jobs: when technology boosts employment. Economic Policy 34(100): 589-626.

Gregory T, Salomons A and Zierahn U (2018) Racing with or Against the Machine? Evidence from Europe. CESifo Working Paper No. 7247.

Gries T and Naudé W (2018) Artificial Intelligence, Jobs, Inequality and Productivity: Does Aggregate Demand Matter? IZA Discussion Paper No. 12005.

Trajtenberg M (2019) AI as the next GPT: a Political-Economy Perspective. In: Agrawal A, Gans J and Goldfarb A (eds) The Economics of Artificial Intelligence: An Agenda. University of Chicago Press, pp.175-186.

17.

Research on Emergency Governance Strategies of Multinational Companies to Deal with the Deterioration of International Relations—Based on the Empirical Analysis of Chinese Manufacturing

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Abstract: With With the continuous rise of emerging economies and the global economic fluctuations caused by the Covid-19, the pattern of global value chains in the past is facing the impact of some countries' anti-globalization policies. Multinational companies embedded in global value chains often face the suddenly deteriorated relationship between countries represented by trade frictions, which inevitably trigger all-round risks from strategy to operation. Based on China's management scenario, this paper effectively identifies the transmission and diffusion mechanism of the impact of international relations deterioration on business operation through cross-case analysis: it is divided into five stages, namely market fluctuations, trade restrictions, resource control, industrial containment and complete blockade, and forms a collection of emergency governance strategies ranging from economic governance to government-enterprise collaborative governance according to the evolution process. Besides, by fully coordinating internal and external stakeholders, the enterprise value proposition of effective response and sustainable development is finally realized. On the other hand, based on the data of listed companies of Chinese manufacturing enterprises, this paper also analyzes the effectiveness of internal and external governance factors in dealing with the uncertainty of the external environment, and then empirically tests the conclusion of qualitative analysis. In a word, this paper has a certain theoretical value and practical significance for enterprises to cope with the changes of international complex environment and build a systematic emergency governance strategy under the background of counter globalization.

Key words: international relation, deterioration, emergency management, multinational company, transmission and diffusion

Reference:

[1] Ding, L., et al.. Promoting the development of enterprise niche: Case study on China's organizational ambidexterity. *Sustainability*,2018; 10(10): 3806.
[2]Kim, J. and J. Yoo. Platform Growth Model: The Four Stages of Growth Model. *Sustainability* ,2019; 11(20): 5562.
[3]Yoo, H. S., et al.. The Characteristics of SMEs Preferring Cooperative Research and Development Support from the Government: The Case of Korea. *Sustainability,* 2018;10(9): 3048.

18.

Evolution of COVID-19 governance behaviors and Governance effect in typical regions of China——multi-case study

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Abstract: This research select typical areas such as Shanghai, Beijing, Shenzhen, Hangzhou, Heilongjiang, Tianjin, Hong Kong and so on (space), and search multi-source data like Anti-COVID-19 special topic in typical websites, national and local special websites and other news report data, and epidemic data in relevant database. We divide the epidemic development into three stages, the early development stage (before the establishment of the Central Leading Group for COVID-19 Prevention and Control), the rapid development stage, and epidemic prevention and control with the resumption of work coordination stage (after the meeting to coordinate efforts to curb the COVID-19 outbreak and promote economic and social development). We compare these areas for differences in Governance focus, governance implementation, and precise policy implementation during the development stages of COVID-19, to explore the behavior evolution and cognitive changes of government, organization and social masses. We will focus on the sensitivity of different areas in the early stage of the epidemic; mid-term prevention and control performance, governance behaviors and specific event governance; and resumption of work and production ability. The impact of these factors on epidemic governance can help to refine epidemic governance model, and to clarify epidemic governance improvement logic. The conclusions will provide guidance for the follow-up improvement of emergency governance capabilities.

Key words: COVID-19; Emergency governance; Event System Theory; Epidemic prevention and control；Public health emergencies

Reference:

[1] Park J, Son M, Park C. Natural disasters and deterrence of economic innovation: a case of temporary job losses by Hurricane Sandy. *Journal of Open Innovation: Technology, Market, and Complexity*. 2017; 3(1):5
[2] Min-Ren Yan, Hui-Lan Chi, Jui-Ying Yang & Kuo-Ming Chien. Towards a City-Based Cultural Ecosystem Service Innovation Framework as Improved Public-Private-Partnership Model—A Case Study of Kaohsiung Dome. *Journal of Open Innovation: Technology, Market, and Complexity*. 2019; 5(4), 85.
[3] Ponsiglione C, Quinto I, Zollo G. Regional Innovation Systems as Complex Adaptive Systems: The Case of Lagging European Regions. *Sustainability*. 2018; 10(8):2862.

19.

Research on the Path of Citizen Participation in Community Epidemic Prevention and Control: Taking X Street in Jiangsu, China as an Example

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Abstract:

Research Question: Taking citizens' active participation in epidemic prevention and control in X Street, Jiangsu, China as an example, the aim is to explore how citizens participate in epidemic prevention and control and the results produced.

Key Literature Reviews: Civic participation has formed a relatively mature theoretical system and participation model in western countries. As an integral part of modern public management, civic participation became a new civic participation movement in the 1960s. Beierle believes that the purpose of civic participation is to make better public policies and thus bring more benefits to the society. Generally speaking, civic participation mainly involves the following aspects: first, participation in political elections; The second is legislative participation and public policy participation, and the third is citizens' participation in the management of public affairs. The word "community" was originally used by German scholar Tennis in the field of sociology, with the meaning of community. "A community is seen as a community of life with common connections and social interactions within a given area". Influenced by western governance theories and civil society theories, community masses are emphasized as "community citizens", and community citizen participation is considered as one of the core characteristics of community governance. Therefore, there are many discussions about "what is citizen participation in community governance". Some scholars believe that civic participation refers to the extensive participation of urban citizens in various public affairs from the bottom up. For citizens, information transparency and civic participation should be guaranteed, rather than fancy slogans. This helps ensure a positive correlation between policy literacy and policy support. The research results on community governance mainly focus on the level, path and concrete effect of citizen participation in community governance. Community civic participation limits the scope of civic participation to the

scope of the community. Combined with China's actual situation: since the reform and opening up, with the continuous change of social structure and the continuous stratification of interest subjects, the demands of urban community residents are increasing day by day, gradually showing the trend of diversification, complexity and differentiation. As the basic unit of urban governance, community has increasingly become an important carrier of social governance and the key to social innovation. Therefore, the role of citizen participation in community governance has become increasingly prominent. In China, scholars have done a lot of research on academic theories. Combined with the investigation of Chinese citizens' participation in social management, various attempts have been made to form a series of analytical frameworks with regional characteristics. For example, he Xuefeng's "Village memory framework and semi-acquaintance society", Xiao Lou, Wang Xiaojun's "Mutual construction village" and so on. Some scholars also try to use governance and good governance as theoretical resources to deduce a new analytical framework and analyze the prospect and concrete measures of citizen participation in community governance.

Design: Citizens' participation in epidemic prevention and control in X Street, Jiangsu province, China provides us with a typical case of citizen participation in social governance in a risk society. This article adopts the method of case study, therefore, citizen participation situation in jiangsu China X street as the research object, use interview method to master data, secondary data collect relevant literature to get at the same time, based on the theory of citizen participation ladder built in this paper, the analysis framework, aims to study the epidemic prevention and control in the process of citizen participation in community practice and produce results. Then explore the effective path of citizen participation in community governance to promote the improvement of citizen participation ability and participation level.

Findings: n the prevention and control of COVID-19, civic participation in community governance, as a public spirit and action aimed at community development, has become a new driving force for community epidemic prevention and control. Therefore, this paper draws the following conclusions through case study: First, citizen participation in community epidemic prevention and control is conducive to the realization of self-organization and self-management organizational model, and the construction of people-centered community space. Secondly, citizens' participation in community epidemic prevention and control contributes to community residents' sense of identity and trust, and enhances the legitimacy and effectiveness of community governance. Thirdly, the participation of citizens in community epidemic prevention and control is conducive to the construction of community space with people's satisfaction based on the actual needs of community residents, and to the improvement of the quality and vitality of community governance. Finally, the participation of citizens in epidemic prevention and control in communities can help improve the sense of ownership of community citizens, cultivate the sense of participation of citizens, and promote the improvement of urban governance ability and level. Therefore, in the context of risk society, the ways to enhance citizen participation in community governance are mainly as follows: First, encourage citizens to participate in activities related to their interests and enhance their sense of participation effectiveness; Secondly, keep up with the characteristics of The Times, use big data technology to optimize the way of citizen participation, and build the electronic path of citizen participation in community governance. Finally, timely feedback to improve the enthusiasm of citizens' participation .

Research limitations: Domestic study of community governance and citizen participation is mostly in the context of the norm, so this article according to the development of the society, combination of COVID at the end of 2019-19, the citizen participation in the research field of localization in the social background, the risk will takes the case of China jiangsu X street at the same time, with the actual situation shows the necessity of citizen participation in community governance and effectiveness, and

puts forward an effective way for citizens to participate in the community prevention and control of epidemic. However, the limitations of this paper may lie in the fact that the universality of the conclusions of the single case study remains to be investigated. Therefore, this paper will make further research on this basis in the future to explore the effective path of citizen participation and promote the improvement of national governance capacity and governance level.

Key words: citizen participation; Community governance; Governance capabilities

References:

[1]Thomas，J.C. Public Participation in Public Decisions：New Skills and Strategies for Public Managers. SanFrancisco，CA：Jossey-Bass，1995.p3.

[2] Beierle，T.C. Using Social Goals to Evaluate PublicParticipation in Environmental Decision. Policy Studies Review，1999，16（3/4）.

[3]Deng Xiujun,Peng Shuang.Trust, Norms and Networks in Social Media Environmental Mobilization: a Social Capital Analysis of Under the Dome in China[J].Asian Journal of Communication,2018,28(05):526-540.

[4]Ma, L., Qian, C., Liu, Z., Zhu. Y. "Exploring the Innovation System of the Animation Industry: Case Study of a Chinese Company"，Sustainability,2018,09.

[5] Yun, Y.; Lee, M. Smart City 4.0 from the Perspective of Open Innovation. J. Open Innov. Technol. Mark. Complex. 2019, 5, 92.

[6] Cha, N.; Hwang, J.; Kim, E. How to Improve Performance and Diversity of Government-Funded Research Institute Ecosystem? Focus on Result Sharing and Feedback Policy. J. Open Innov. Technol. Mark. Complex. 2019, 5, 66.

[7] Rey-Pérez, J.; Domínguez-Ruiz, V. Multidisciplinarity, Citizen Participation and Geographic Information System, Cross-Cutting Strategies for Sustainable Development in Rural Heritage. The Case Study of Valverde de Burguillos (Spain). Sustainability 2020, 12, 9628.

[8] Liu, L.; Chen, J.; Cai, Q.; Huang, Y.; Lang, W. System Building and Multistakeholder Involvement in Public Participatory Community Planning through Both Collaborative- and Micro-Regeneration. Sustainability 2020, 12, 8808.

[9] Uribe-Echeberria, R.; Igartua, J.I.; Lizarralde, R. Implementing Open Innovation in Research and Technology Organisations: Approaches and Impact. J. Open Innov. Technol. Mark. Complex. 2019, 5, 91.

[10] Yin Haodong, Huo Peng, Wang Sangui. Digital Transformation of Agriculture and Rural Areas: Realistic Representation, Influence Mechanism and Promotion Strategy [J/OL]. Reform: 1 to 9.

20.

Research on the digital transformation of local government services in China -- A case study of Shanghai, China

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Purpose: This paper studies how local governments improve the level of government services through digital transformation under the background of global government digital transformation, and puts forward reference countermeasures for the digital transformation of government affairs services in other regions.

Key literature reviews: the research on digital transformation involves many aspects. This paper summarizes the research status of digital transformation from three aspects. The first is the research on the subject of digital transformation. From the existing research, some scholars focus on the subject of digital transformation, and think that the main body of digital transformation is the government and enterprises. Xu Feng (2020) [1] takes the government as the main body of digital transformation, and takes Zhejiang, one of the leading provinces in the government reform, as an entity to investigate. It analyzes the exploration process and governance performance of local government digital transformation, analyzes the obstacles and obstacles of current local government digital transformation, and explores its internal mechanism and implementation process. Zhang Pei and Zhang Miaomiao (2020) [2] taking manufacturing enterprises as the main body of digital transformation, from two dimensions of internal value driving force and external technology driving force, the logical analysis framework of digital transformation of manufacturing enterprises is constructed, which helps manufacturing enterprises identify the key trigger scenarios and trigger mechanisms of their

digital transformation, and provides theoretical support for the digital strategic transformation of manufacturing enterprises. The second is the research on the problems in the process of digital transformation. Digital transformation is the trend of the times under the background of "Internet of things", but the process of its development will inevitably produce corresponding problems, which have aroused the attention and thinking of some scholars. Yin Haodong (2020) [3] and others found that the development of digital technology is backward in rural areas by comparing the level of urban and rural digital economy, and analyzed the problems in the process of rural digital transformation, such as poor network facilities, low service level and industrial digitization process, and put forward countermeasures and suggestions to reduce the inequality of opportunity and ability of sharing digital dividend between urban and rural areas. Liu Qi (2020) [4] through the analysis of the obstacles faced by the Chinese government in the process of digital transformation and digital government construction, such as imprecise business planning, inconsistent item standards, difficult sharing of data resources, unbalanced regional development, and inadequate government enterprise cooperation, and based on the experience of digital construction in Shanghai, Zhejiang and other places, this paper puts forward an overall collaborative government digital transformation path. Finally, it is about the research of foreign digital transformation experience. As a late developing country of digital transformation, China's research results and theories lag behind foreign scholars. Therefore, some scholars pay attention to the Enlightenment of foreign digital transformation experience to China. Zhang Yanhua and Wang Liping (2020) [5] through analyzing the relevant strategic texts of the governments of the United Kingdom, Australia, the United States and Canada and tracking the progress of the transformation practice, they studied the government digital transformation strategies of developed countries from the perspectives of vision, challenges and tasks, and provided useful experience for the digital transformation of Chinese government. Based on the perspective of policy system analysis, Lin Mengyao (2019) [6] and others discussed in detail the changes and progress of the policy system of digital government in the UK in the past 25 years from the perspective of "strategy tool structure", and emphasized the advantages and reference significance of digital transformation in the UK from the strategic and instrumental levels.

Design: This paper mainly adopts two research methods: case study method and field investigation method. In the case study, this paper takes Shanghai municipal government of

China as the research object, analyzes the reform of "all in one network" adopted by Shanghai municipal government to promote the digital transformation of government services. Meanwhile, with the help of field investigation, it specifically expounds the cause, process, operation status and role of the "one network through one office" reform of Shanghai municipal government.

Findings: at present, Shanghai takes "one network and all in one office" as the starting point for deepening government governance and building digital government, forming a digital government architecture system and digital governance environment with a full chain service platform, two engines running side by side, all media communication and feedback, and multi-agent collaborative cooperation, which has reference significance for other regions to promote the digital transformation of government services. Therefore, based on the in-depth analysis of Shanghai's "all in one network" reform, this paper summarizes the following countermeasures: first, we should strengthen the "standardization" construction of government departments. Deepening the standardization and standardization of government services is conducive to simplifying the procedures, strengthening the cooperation between departments and promoting government process reengineering; second, it is to promote the construction of digital service platform. The digital transformation of government services is inseparable from the reasonable operation of the portal website and the corresponding platform support, so we should pay attention to the development and maintenance of digital service platform; third, the establishment of big data processing center and control center. In the process of promoting "all in one network", the Shanghai municipal government has formed a dual engine mode of "data platform" and "business platform" to drive the construction of digital government, which is the key to the success of the digital transformation of Shanghai's government services; fourthly, promoting multi-agent cooperation. Encourage enterprises and citizens to actively participate in the process of digital transformation of government services, promote government enterprise cooperation, improve citizen participation, and build a service-oriented government.

Research limitations: the research deficiency of this paper is mainly on the practical level. This paper takes the reform of "all in one network" in Shanghai as the case study object.

Although it has certain advantages in case typicality, it is still a case study. In the future, we will choose other cities' digital cases and carry out multi case studies to make the conclusion more universal.

Keywords: digital government; digital governance; digital transformation; government service

Reference:

Ma, L., Li, T., Wu, J. and Yan,D."The Impact of E-Hailing Competition on the Urban Taxi Ecosystem and Governance Strategy from a Rent-Seeking Perspective: The China E-Hailing Platform",journal of open innovation: Technology,Market,and Complexity,2018,04.

Ma, L., Liu, Z., Huang, X., Li, T. "The Impact of Local Government Policy on Innovation Ecosystem in Knowledge Resource Scarce Region: Case Study of Changzhou, China", Science, Technology & Society, 2019, 24(1): 29-52.

Jeffrey J.Pittaway,Ali Reza Montazemi. Know-how to lead digital transformation: The case of local governments. 2020.

Ioannis Nanos, Eugenia Papaioannou, Efthymia Androutsou, et al. The role of cloud computing and citizens relationship management in digital government transformation. 2019, 13(2):120-136.

Liu, Z., Ma, L., Zhu, Y., Ji, W." An Investigation on Responsible Innovation in the Emerging Shared Bicycle Industry: Case Study of a Chinese Firm",journal of open innovation:Technology,Market,and Complexity,2019,05.

Gardanova, Z.; Ponkratov, V.; Kuznetsov, N.; Nikitina, N.; Dudnik, O.; Latypova, E.; Shcherbatykh, S. A Model for Optimizing the Structure of Teaching Techniques for Distance Learning in the Russian Higher Education System. J. Open Innov. Technol. Mark. Complex.2020,6,147.

Priyono, A.; Moin, A.; Putri, V.N.A.O. Identifying Digital Transformation Paths in the Business Model of SMEs during the COVID-19 Pandemic. J. Open Innov. Technol. Mark. Complex.2020,6,104.

21.

Consortium-type collaboration in semiconductor industry: application to new product technology and new product development

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Abstract

Purpose/ Research Question:

Based on past examples of consortiums of semiconductor technology development, we will examine whether the application of project-type innovation processes, which are difficult to achieve in single company or single industry, is applicable to ADAS(Advanced Driver-Assistance Systems), whose development is expected to accelerate in the future.

Key Literature Reviews and Background:

Overview of the Semiconductor Consortium

The semiconductor industry has been working on the miniaturization of circuit line width in order to realize "Moore's law" (Semiconductor integration rate doubles in 18 months) announced in the mid-1960s

A consortium of semiconductor manufacturers, semiconductor production equipment manufacturers, and material manufacturers was the driving force behind this

Background of the Consortium

Cases where huge amounts of money are needed for future new product development

Manufacturing and technology development processes cannot be completed by single company

Background:

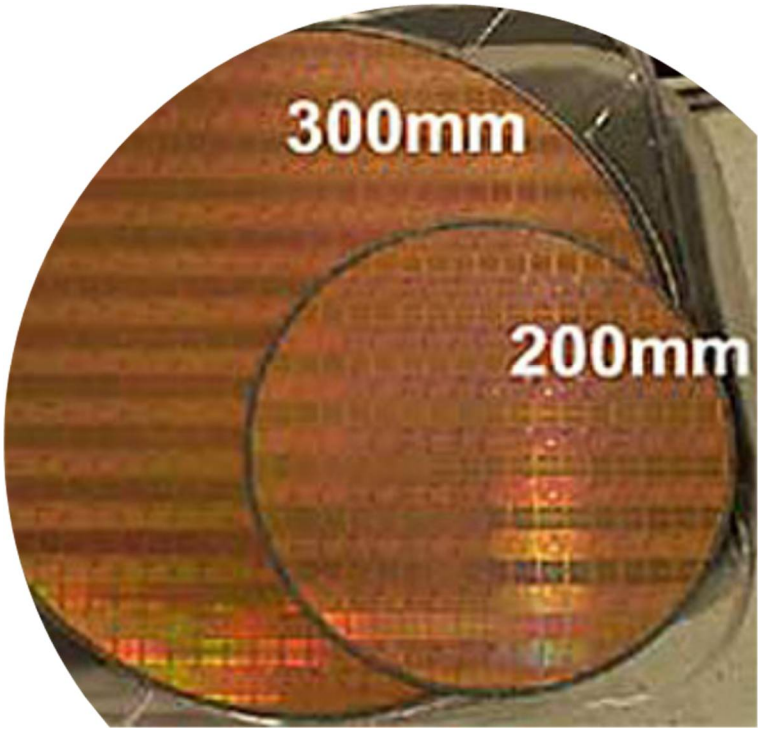
In case of semiconductors, it costs huge amount of money to develop them, manufacturing processes range from exposure and etching to film formation and cleaning

As a result, it becomes a consortium of dozens of companies

This is how industry-wide innovation happened 300 mm silicon wafer development

The history of the semiconductor is the history of the refinement and the large diameter silicon wafer.

The purpose of this consortium is to improve productivity by expanding the size of wafer and standardizing manufacturing equipment and processes.



Background:

As a result, it has greatly contributed to the progress of miniaturization to date, and has also had a great impact on the advancement of the semiconductor industry worldwide

On the other hand, it is also true that the number of companies engaged in semiconductor-related work has decreased significantly due to the large investment costs of participating companies

Application to ADAS

Currently, ADAS is speeding up its development with individual automakers partnering with third parties

As with the consortiums mentioned above, development and evaluation costs are expected to be enormous

ADAS development requires not only automakers but also telecommunications, semiconductor(CPUs, sensors, memory), software development companies, etc.

Background:

In the semiconductor consortium, not only the miniaturization but also the standardization of the manufacturing process contributes to the reduction of the manufacturing cost of the whole industry.

With this in mind, the case of ADAS should be promoted consortium-like project for standardization?

Design/ Methodology/ Approach: Contents

Benefits and costs inferred from the results of the semiconductor consortium

In the case of ADAS as a consortium project, verification of key factors from the viewpoint of technology development difficulty

Verification of environmental impact

Formulation of expected outcome based on the above

(Expected) Findings/Results:

Environmental impact of ADAS development and commercialization (In comparison with current internal combustion automobile) increase or decrease in the number of traffic accidents

Cost savings from manufacturing standardization compared to individual development

Research limitations/ Implications:

Keywords:

Future Technology Development of Semiconductors(Logic, Memories)

COVID-19's uncertainty

Potential deterioration in the performance of the automakers that will be at the center of ADAS development over the next year or so.

22.

Impact of Covid-19 and Diversity Management in Japan: Open Innovation Attempts

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Abstract

Diversity management, especially gender diversity, is said to be a main bottleneck for the Japanese economy to grow. Concerning gender diversity management, we conducted survey to major companies in Japan, which are signatories of UN Global Compact and UN Women. More than 70 best practices were reported and we interviewed in detail of those cases. Among them, some are considered as open innovation approaches. Generally speaking, Covid-19 has negatively impacted women in the world, including Japan. This paper examines how diversity management measures relate to the pandemic and how open innovation approach be effective to cope with the pandemic among big businesses in Japan.

Purpose/ Research Question:

What are the diversity management measures taken among Japanese large corporations.

How those diversity management measures relate to open innovation approach?

How pandemic affected women workers and diversity management measures, in general, and in relation to the open innovation in particular?

Key Literature Reviews:

Open Innovation and Social Change

- Liu, Z.; Stephens, V. Exploring Innovation Ecosystem from the Perspective of Sustainability: Towards a Conceptual Framework. J. Open Innov. Technol. Mark. Complex. 2019, 5, 48.
- Rasiah, R. Building Networks to Harness Innovation Synergies: Towards an Open Systems Approach to Sustainable Development. J. Open Innov. Technol. Mark. Complex. 2019, 5, 70.
- Lee, M.; Yun, J.J.; Pyka, A.; Won, D.; Kodama, F.; Schiuma, G.; Park, H.; Jeon, J.; Park, K.; Jung, K.; Yan, M.-R.; Lee, S.; Zhao, X. How to Respond to the Fourth Industrial Revolution, or the

Second Information Technology Revolution? Dynamic New Combinations between Technology, Market, and Society through Open Innovation. J. Open Innov. Technol. Mark. Complex. 2018, 4, 21.

Open Innovation and Covid-19

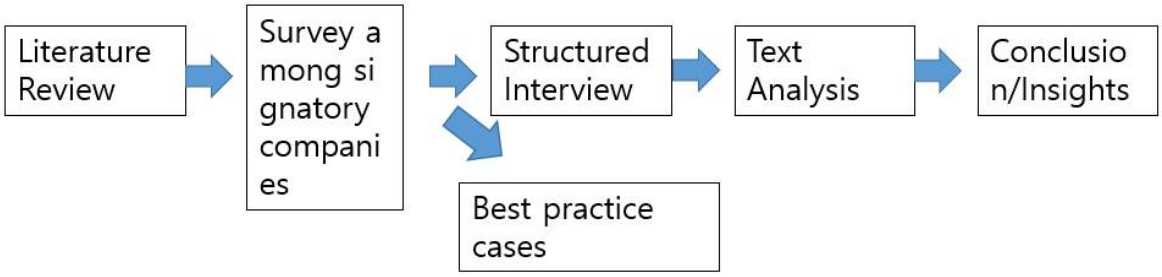
- Chesbrough, H.: To recover faster from Covid-19, open up: Managerial implications from an open innovation perspective. Industrial Marketing Management, 88, July 2020, 410-413
- Anita M. McGahan, Marcel L. A. M. Bogers, Henry Chesbrough, Marcus Holgersson; Tackling Societal Challenges with Open Innovation. California Management Review, October 2020, 0(0), 1-13.

Gender Diversity / Diversity Management

- Mung, E; Jung, J.: Change above the Glass Ceiling: Corporate Social Responsibility and Gender Diversity in Japanese Firms, Administrative Science Quarterly, July 2018, Volume: 63 issue: 2, page(s): 409-440

Design/ Methodology/ Approach:

Research takes following steps: 1) literature review; 2) Survey among signatories; 3) in-depth interviews of gender diversity best cases; 4) text analysis of interviews, if applicable; and 5) conclusion/insights.



This research is going to be conducted with the Global Compact Network Japan.

The initial survey was conducted with the Global Compact Network Japan and UN Women Japan chapter.

(Expected) Findings/Results:

1. Variety of cases concerning gender diversity management
2. Possible attempts of gender diversity, in relation to open management

3. Impact of Covid-19 at workplace in relation to gender diversity, both positive and negative.
4. Emergence of new tactics, responding to Covid-19 situation, in terms of gender diversity management.

Research limitations:

Interviews only

Covid-19 situations are still evolving and new measures are yet to be institutionalized

Research Implications

In terms of impact of Covid-19 to the open innovation in Japan, provide the important insights, focusing around diversity management (cultural diversity in its relate to open innovation).

Contribution to consider gender diversity and Covid-19.

Keywords:

Open innovation, Covid-19, diversity management, gender diversity

Reference (selected ones only):

- Anita M. McGahan, Marcel L. A. M. Bogers, Henry Chesbrough, Marcus Holgersson; Tackling Societal Challenges with Open Innovation. California Management Review, October 2020, 0(0), 1-13.
- Chesbrough, H.: To recover faster from Covid-19, open up: Managerial implications from an open innovation perspective. Industrial Marketing Management, 88, July 2020, 410-413
- Lee, M.; Yun, J.J.; Pyka, A.; Won, D.; Kodama, F.; Schiuma, G.; Park, H.; Jeon, J.; Park, K.; Jung, K.; Yan, M.-R.; Lee, S.; Zhao, X. How to Respond to the Fourth Industrial Revolution, or the Second Information Technology Revolution? Dynamic New Combinations between Technology, Market, and Society through Open Innovation. J. Open Innov. Technol. Mark. Complex. 2018, 4, 21.
- Liu, Z.; Stephens, V. Exploring Innovation Ecosystem from the Perspective of Sustainability: Towards a Conceptual Framework. J. Open Innov. Technol. Mark. Complex. 2019, 5, 48
- Rasiah, R. Building Networks to Harness Innovation Synergies: Towards an Open Systems Approach to Sustainable Development. J. Open Innov. Technol. Mark. Complex. 2019, 5, 70.

23.

Collaborative opportunity identification of Artificial Intelligence: An empirical analysis based on the patent network

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Abstract

Purpose/ Research Question: The construction of collaborative innovation mechanism has always been a hot research topic. To explore the collaborative innovation structure and evolution drivers under the internal organization framework of industry clusters, this paper carried out corresponding empirical research based on the collaborative network of patent inventors for the artificial intelligence clusters.

Key Literature Reviews (About 3~5 papers):

For most of the prior research, knowledge transfer of multi-national enterprise (MNE) is usually the focus of attention (Patra et al., 2015). The network is based on the complex innovation system framework with local triple helix (Laitinen et al., 2016). Knowledge sharing system and strategic guidance for knowledge learning are the important factors that have a positive effect on the learning transfer (Sung et al., 2016).

Design/ Methodology/ Approach: By collecting patent data from the artificial intelligence industry clusters worldwide, this study applied the multiple quadratic assignment procedures (QAP) regression method to investigate the mechanism that the local structure has influence on the overall structure in the technology coupling relationship network.

(Expected) Findings/Results: The research results show that three characteristics shown by the local technology coupling relationship, tendency, hierarchical convergence and hierarchical heterogeneity, have significant influence on the overall technology coupling relationship. These three characteristics play an important role in the collaborative innovation structure, and establish the foundation of sustainable technological innovation for the industry clusters. Furthermore, the management implications indicate that the majority technology coupling relationships distributed to the innovation entities that are at middle-level of enterprise group can promote stability and sustainability of the collaborative innovation structure.

Research limitations/ Implications: There are also some limitations that need to be considered in further studies. In this paper, it is not enough to discuss the periodical characteristic in the collaborative innovation structure. The research questions proposed determine that the empirical analysis focuses more on the mechanism which local structures have influence on the whole structure rather than the time-based evolution trend of collaborative innovation network. The understanding on the driving effect of technology coupling relationship will be much more profound if the periodical characteristic can be clearly identified.

Keywords: Collaborative Innovation, Technology Coupling, Innovation Network Structure, QAP

Reference:

Yu, X., Lu, L., Liu, J. and Zhou, Z., (2014), Knowledge diffusion path analysis of data quality literature: A main path analysis. Journal of Informetrics, 8(3), 594–605.

Leydesdorff, L., (2018), Synergy in Knowledge-Based Innovation Systems at National and Regional Levels: The Triple-Helix Model and the Fourth Industrial Revolution. Journal of Open Innovation: Technology, Market, and Complexity, 4(2), 16.

Patra, S.; Krishna, V. Globalization of R&D and open innovation: linkages of foreign R&D centers in India. Journal of Open Innovation: Technology, Market, and Complexity, 2015, 1(7): 1-24.

Laitinen, I.; Osborne, M.; Stenvall, J. Complex regional innovation networks and HEI engagement - the case of Chicago. International Journal of Knowledge-Based Development, 2016, 7(2): 184-201.

Sung, S.; Rhee, J.; Yoon, J. Learning Organisation Activities and Innovativeness of Tech-based SMEs within Korean Technoparks: The Mediating Role of Learning Transfer. Science Technology and Society, 2016, 21(3): 410-434.

24.

Construction and application of enterprise technology innovation risk early-warning system based on patent mining

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Abstract

Purpose/ Research Question: Various kinds of risks exist in the whole process of enterprise technology innovation, and the patent right that protects technology innovation has regional characteristic. Focus on the patent infringement risk in China in the commercialization stage of technology innovation process, this paper aims to construct an enterprise technology innovation risk early-warning system based on patent mining. This paper also makes an empirical study on the core patent infringement risk early-warning system of China's major high-speed railway enterprises, in order to provide reference for the risk management and investment decision-making of enterprises' patented technology in China.

Key Literature Reviews (About 3~5 papers): Intellectual property management capability affects technology innovation of enterprises [1], and a good patent infringement risk early-warning system is very important for enterprises to manage and control their technology innovation risks.

In the early research of risk early warning, expert evaluation method such as analytic hierarchy process (AHP) evaluation is often used. Later, econometric methods became more widely used, for example, econometric model and principal component analysis (PCA) are used to construct and apply anti-dumping early warning system [3]. Recently, the construction of risk early-warning system based on data mining has become a new research trend. However, the research objects are mainly enterprise financial risks, which do not match with the characteristics and requirements of technology innovation risk early warning.

Fuzzy set theory was first proposed in 1965, using membership degree and membership function to express uncertain information [8]. Based on the fuzzy set theory, intuitionistic fuzzy sets were proposed, which have better flexibility and more powerful functions in dealing with uncertain information because of the consideration of non-membership degree and hesitancy degree besides membership degree [9]. Based on the Hamming distance and the Euclidean distance, which are most widely used distances for fuzzy sets, distances for two intuitionistic fuzzy sets was proposed

[10], and later widely used in Risk Assessment. However, as one of the methods of data mining, intuitionistic fuzzy set has seldom been applied in the field of enterprise technology innovation risk especially patent infringement risk early warning.

Design/ Methodology/ Approach: At first, from the perspective of the whole process of enterprise technology innovation, this paper summarizes the core risks in each stage of technology innovation. Further, focus on the patent infringement risk in China in the commercialization stage of technology innovation process, an early-warning system of enterprise technological innovation risk in China is constructed: Firstly, in accordance with The Patent Law of the People's Republic of China and other relevant laws and regulations, the judging criteria for patent infringement in China are established, and based on the method of patent text mining, the type of patent infringement risk is evaluated from the technical dimension; Secondly, based on the method of intuitionistic fuzzy sets in patent data mining, the enterprise patent infringement risk early-warning index system is constructed from three dimensions of technology, law and policy, the weights of each index are calculated by intuitionistic fuzzy entropy, and by using intuitionistic fuzzy weighted geometric operator and distances between intuitionistic fuzzy sets, the infringement risk level of enterprise patent and patent combination is finally determined.

(Expected) Findings/Results: An empirical study was conducted on the core patent infringement risk early-warning system of China's major high-speed railway enterprises to demonstrate the feasibility and superiority of the system, in the hope of providing reference for the risk management and investment decision-making of enterprises' patented technology in China.

Research limitations/ Implications: The evaluation of patent value is closely related to the patent portfolio, and is dynamic and confidential. Therefore, it is difficult to consider the economic dimension in the risk early-warning index system, and specific analysis should be made on the core patents of enterprises. In addition, considering the regional characteristic of patent protection, the risk early-warning system constructed in this paper is only applicable to Chinese patents of technological innovation of enterprises. In the future, the risk early warning-system of technological innovation in the United States and other countries will be studied.

Keywords: enterprise technology innovation risk; patent infringement risk in China; risk early-warning; patent mining; intuitionistic fuzzy set

Reference:

[1] So, Y.K.; Eungdo, K. How Intellectual Property Management Capability and Network Strategy Affect Open Technological Innovation in the Korean New Information Communications Technology

Industry. *Sustainability* **2018**, 10(8), 2600.

[2] Intarakumnerd, P.; Charoenporn, P. Impact of stronger patent regimes on technology transfer: The case study of Thai automotive industry. *Research Policy* **2015**, 44: 1314-1326.

[3] Ye, H.; Wang, L. Construction and application of anti-dumping early-warning system: Case study on Sino-US steel trade. 2012 International Conference on Management Science and Engineering (ICMSE), 2012: 909-915.

[4] Jeong, H.J.; Sung, K.K.; Jin, H.K. Historical review on the patterns of open innovation at the national level: the case of the roman period. *J. Open Innov. Technol. Mark. Complex.* **2015**, 1(2), 20.

[5] Byung, Y.H.; Hee, J.J.; Mee, H.C.; Dae, C.K. A case study on the improvement of institution of "High-Risk High-Return R&D" in Korea. *J. Open Innov. Technol. Mark. Complex.* **2017**, 3(3), 19.

[6] Moehrle, M.G.; Gerken, J.M. A new instrument for technology monitoring: Novelty in patents measured by semantic patent analysis. *Scientometrics* **2012**, 91: 645-670.

[7] Yu, X.; Zhang, B. Obtaining advantages from technology revolution: A patent roadmap for competition analysis and strategy planning. *Technological Forecasting and Social Change* **2019**, 145: 273-283.

[8] Zadeh, L.A. Fuzzy sets. *Information & Control* **1965**, 8(3): 338-353.

[9] Intanssov, K.T. Intuitionistic fuzzy sets. *Fuzzy Sets & Systems* **1986**, 20(1): 87-96.

[10] Szmidt, E.; Kacprzyk, J. Distances between Intuitionistic fuzzy sets. *Fuzzy Sets & Systems* **2000**, 114(3): 505-518.

[11] Ghorabaee, M.K.; Amiri, M.; Zavadskas, E.K.; et al. Fuzzy extension of the CODAS method for multi-criteria market segment evaluation. *Journal of Business Economics & Management* **2018**, 18(1): 1-19.

25.

Zig-Zag Growth Patterns of Open Innovation Dynamics

-The Diversity in OI cost amount, OI benefit size, and OI time lag & span

JinHyo Joseph Yun(Corr.)

DooSeuk Lee(DGIST)

HeungJu Ahn(DGIST)

Xiaofei Zhao(DGIST)

KyungBae Park

1. Research Question

How about the difference of growing pattern of firms from open innovation dynamics according to belonging sectors, or the orientation of business models?

What are the differences of growing patterns of firms from open innovation dynamics according to belonging sectors, or the orientation of business models?

- Are there any differences in causal loops for growing of firms from open innovation dynamics, and the location of policy(strategy) lever at the causal loop according to belonging sectors, or the orientation of business models?

2. Literature reviews and research framework

2.1. Literature reviews

Open innovation networks and the role of intermediaries: an agent-based simulation(Secchi, 2016)

Exploring open innovation strategies: a simulation approach(Savitskaya & Ihrig, 2012).

How small system dynamics models can help the public process(Ghaffarzadegan, Lyneis, & Richardson, 2011) Open Innovation in a dynamic Cournot duopoly (Hasnas, Lambertini, & Palestini, 2014)

Open innovation model: enabling the market uptake of innovation(Silviana, 2018)

Brokerage, Boundary Spanning , and Leadership in Open Innovation Communities(Fleming & Waguespack, 2007) Bikes3s: A tool for bike sharing systems simulation(Wheeler, 2019)

Innovation as an Emerging System Property: An Agent Based Simulation Model(Antonelli, Ferraris, & Simulation, 2011)

A framework for evaluating the dynamic impacts of the Brazilian Urban mobility policy for transportation socioeconomic systems: A case study in Ro de Janeiro (Fontoura, Ribeiro, & Chaves, 2019)

Economic Granularity Interval in Decision Tree Algorithm Standardization from an Open Innovation Perspective: Towards a Platform for Sustainable Matching(Li, Ma, Liu, Liang, & Complexity, 2020)

Artificial Intelligence Modelling Framework for Financial Automated Advising in the Copper Market(Méndez- Suárez, García-Fernández, Gallardo, & Complexity, 2019)

Model Development of Innovative Wood Substitutes for the Sustainable Growth of the Thai Wood Substitution Industry(Anuntaruttana, Roopsing, & Complexity, 2020).

2.2. Research Framework

- 3 Dimension Simulation model

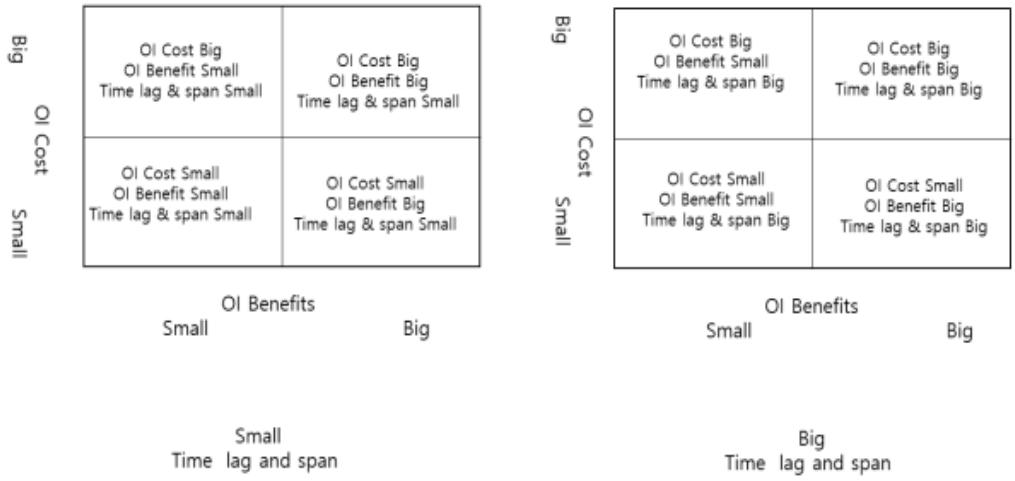

Figure 1. 3 Dimension Simulation model

- 8 Categories of Sectors or BM orientations

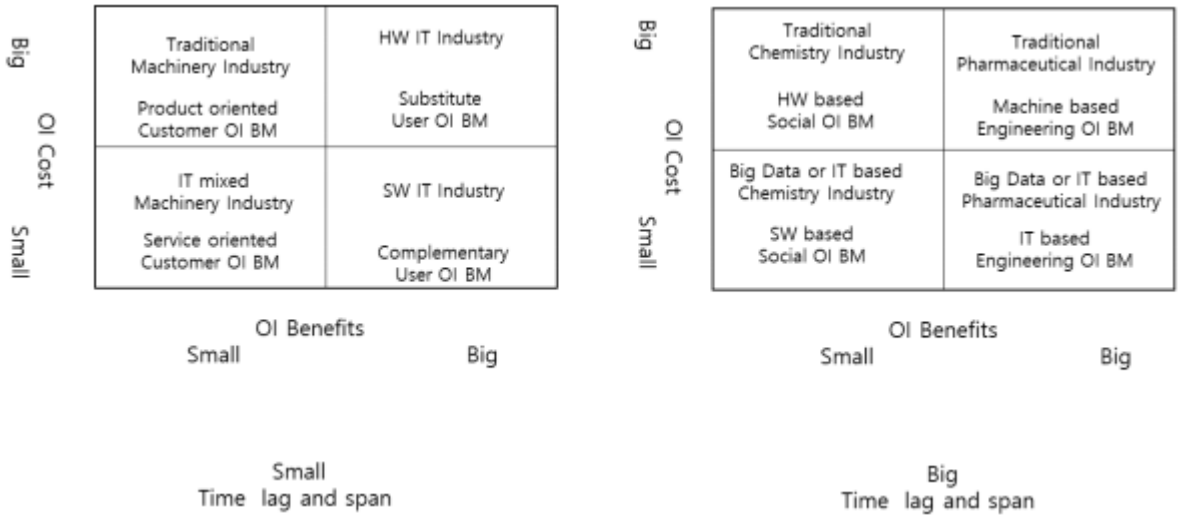

Figure 2. 8 Categories of Sectors or BM orientations

- 8 Different Policy(Strategy) leverage in Causal loops

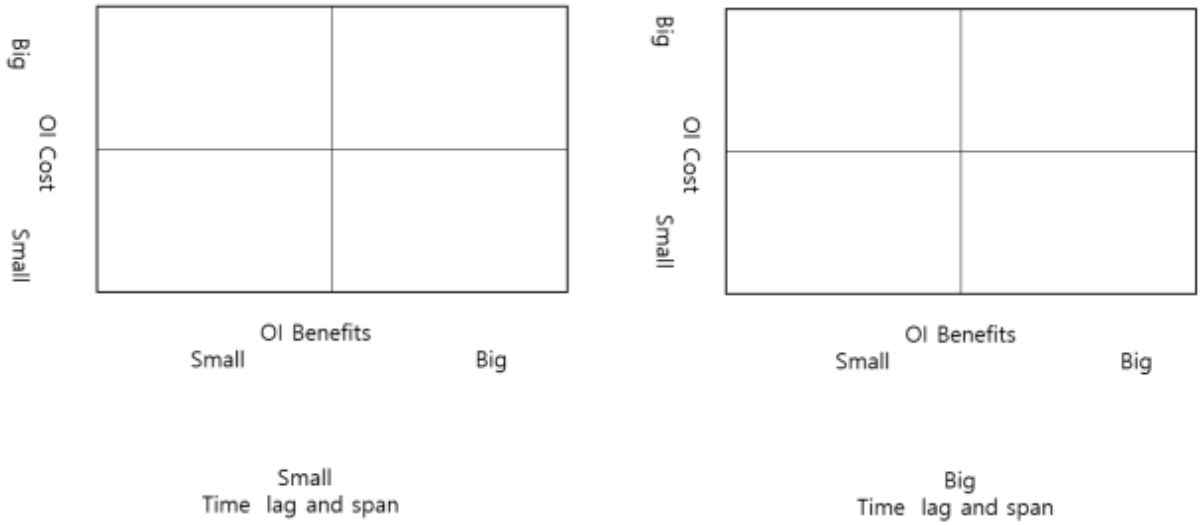

Figure 3. 8 Different Policy Leverage in Causal loops

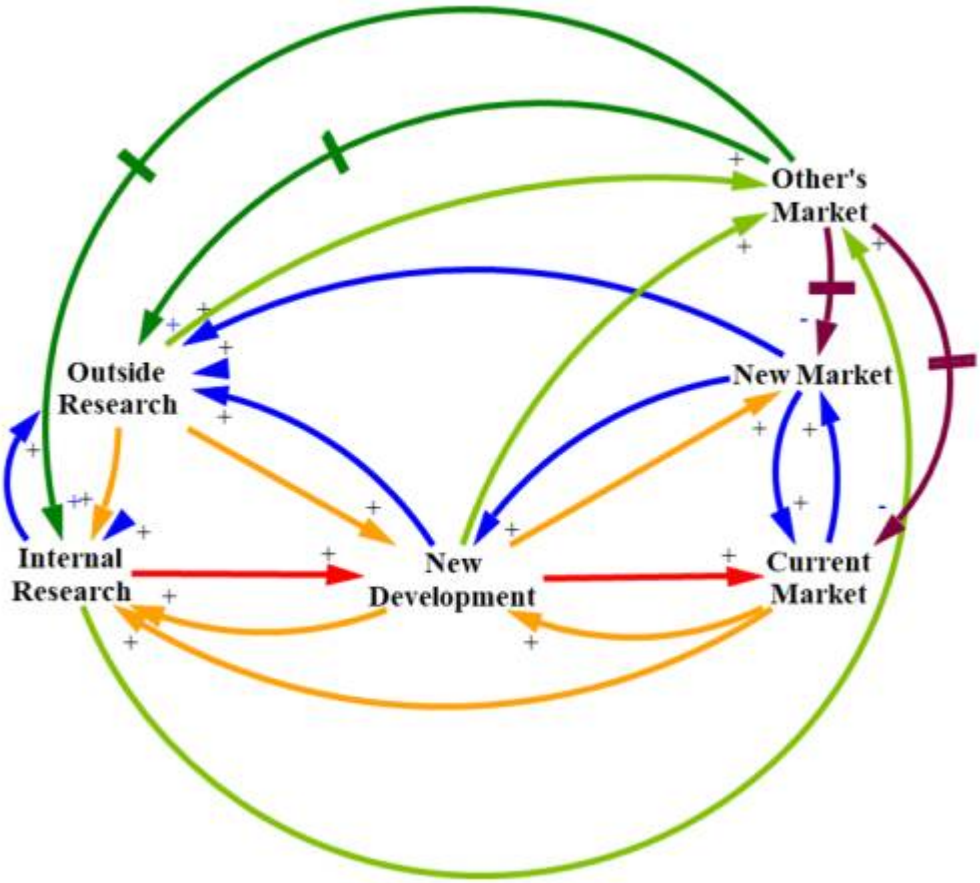

Figure 4. Causal Loop Modeling

<Reference>

Antonelli, C., Ferraris, G. J. J. o. A. S., & Simulation, S. (2011). Innovation as an emerging system property: an agent based simulation model. 14(2), 1.

Anuntaruttana, T., Roopsing, T. J. J. o. O. I. T., Market,, & Complexity. (2020). Model Development of Innovative Wood Substitutes for the Sustainable Growth of the Thai Wood Substitution Industry. 6(1), 17. Fleming, L., & Waguespack, D. M. J. O. s. (2007). Brokerage, boundary spanning, and

leadership in open innovation communities. 18(2), 165-180.

Fontoura, W. B., Ribeiro, G. M., & Chaves, G. D. L. J. J. o. S. (2019). A framework for evaluating the dynamic impacts of the Brazilian Urban Mobility Policy for transportation socioeconomic systems: A case study in Rio de Janeiro. 1-16.

Ghaffarzadegan, N., Lyneis, J., & Richardson, G. P. J. S. D. R. (2011). How small system dynamics models can help the public policy process. 27(1), 22-44.

Hasnas, I., Lambertini, L., & Palestini, A. J. E. M. (2014). Open Innovation in a dynamic Cournot duopoly. 36, 79-87.

Li, T., Ma, L., Liu, Z., Liang, K. J. J. o. O. I. T., Market,, & Complexity. (2020). Economic Granularity Interval in Decision Tree Algorithm Standardization from an Open Innovation Perspective: Towards a Platform for Sustainable Matching. 6(4), 149.

Méndez-Suárez, M., García-Fernández, F., Gallardo, F. J. J. o. O. I. T., Market,, & Complexity. (2019). Artificial Intelligence Modelling Framework for Financial Automated Advising in the Copper Market. 5(4), 81. Savitskaya, I., & Ihrig, M. (2012). Exploring Open Innovation Strategies: A Simulation Approach. Paper presented at the ECMS.

Secchi, E. (2016). Open Innovation Networks and the Role of Intermediaries: An Agent-Based Simulation. In Agent-Based Simulation of Organizational Behavior (pp. 329-344): Springer.

Silviana, B. G. J. P. M. (2018). Open innovation model: enabling the market uptake of innovation. 22, 893-899. Wheeler, S. (2019). Digital Learning in Organizations: Help Your Workforce Capitalize on Technology: Kogan Page Publishers.

26.

Building financial literacy during the COVID-19 pandemic

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Konstantins Kozlovskis
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Abstract

Purpose: Today COVID-19 pandemic changes the daily lives people in many countries. The importance of financial literacy is growing in such economically and socially difficult situations. The aim of the study was to find out how a pandemic affects people's decisions regarding personal financial management. Can they pay for housing and other necessities, manage their debt after a loss income family in Latvia? The pandemic calls for a review of very important areas of personal financial planning: revenue, expenditure and goals. In turn, the achievement of goals depends significantly on savings.

Key Literature Reviews: The Covid-19 pandemic is still spreading, affecting countries and their populations. To date, many studies have shown the negative effects of a pandemic on a country's GDP growth rate. For example, country imposing restrictions on movement and other measures aimed at curbing the epidemic (Vasiljeva et.al.2020). Each country develops its own compensatory mechanisms according to the degree of threat, to maintain the viability enterprises. If a company is unable to provide jobs for its employees, then has affected a people's income. Lower income of households then influenced quality of life, caused disruption mental health, and social problems (Sujadi et al. 2020). The results suggest that financial knowledge may reinforce the influence of personality traits that tend to be associated with positive financial behaviors (Cude et al.2020) and this is very important because economic fallout of the pandemic has exacerbated the financial fragility (Lusardi et al. 2020). In a modern society, people often struggle with financial problems and face various crises of their own (Kadoya 2020).

Methodology: The research is based on the analysis of the theoretical literature and the impact of the pandemic on savings and consumption of the Latvian household. Quantitative analysis is based on structured questionnaire which was used to obtain empirical data. The survey was conducted from 11 to 22 September 2020, surveying 1,011 respondents aged 18 to 75 using the live interview method. The survey consisted of two sections: demographics and measurement items, using a five-point Likert scale. Empirical data processing and analysis were performed with the help of SPSS

software.

Findings: Government in Latvia has announced coverage of 75% of the costs of outbreak-induced sick leaves or workers' downtime, or up to 700 euros per month. Of the surveyed respondents, 8 percent had received state emergency support, most in the age group from 45 to 54 years - 13.5 percent. For many consumers, their incomes are falling and they not optimistic about their country's economic future outlook. The impact of the pandemic on people's purchasing habits and financial literacy was also examined and compared to the situation before the Covid-19 pandemic. People's shopping habits have changed. Among those who indicated that their shopping habits had changed, 38.5 percent visited stores less often without using online shopping, and 9.3 percent preferred online shopping. 26.1 percent of respondents indicated that they have experienced a decrease in income during the pandemic, while 17.3 percent - as well as a decrease in expenses. Due to the experience of the Covid-19 pandemic, part of the population has decided to save money for greater security in the future.

Research limitations: The limitations of the study are the time period and the sample size available.

Keywords: Covid-19, savings, consumption, Latvians' personal finance.

Reference

Vasiljeva, M., Neskorodieva, I., Ponkratov, V., Kuznetsov, N., Ivlev, V., Ivleva, M., ... & Zekiy, A. (2020). A Predictive Model for Assessing the Impact of the COVID-19 Pandemic on the Economies of Some Eastern European Countries. *Journal of Open Innovation: Technology, Market, and Complexity*, *6*(3), 92.

Sujadi, E., Kamil, D., DS, M. R., Yandri, H., Juliawati, D., Fadhli, M., & Indra, S. Does COVID-19 Significantly Affect the Quality of Life? The Impact Analysis of COVID-19 on Work, Financial, Quality of Worship, Emotional and Social Aspects.

Cude, B. J., Chatterjee, S., & Tavosi, J. (2020). Financial Knowledge, Personality Traits, and Risky Borrowing Behaviors in Iranian Households. *Sustainability*, *12*(18), 7608.

Lusardi, A., Hasler, A., & Yakoboski, P. J. (2020). Building up financial literacy and financial resilience. *Mind & Society*, 1-7.

Kadoya, Y.; Khan, M.S.R. Financial Literacy in Japan: New Evidence Using Financial Knowledge, Behavior, and Attitude. *Sustainability* 2020, *12*, 3683.

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27.

Comparison of value added in dependence with investments in transport in selected EU countries

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Abstract:
Purpose/ Research Question: The article considers the impact of investment on value added in the transport sector. In the current crisis, transport is still a frequently used industry. The reasons for transport may differ for transportation of goods, services, and people. The article analyses data on the largest transport companies in EU28. Factors such as the quality of transport services provided, the inflow of investment to create jobs, and innovation in science and research will also be taken into account. Our research question was: What is the ideal ratio of added value and investments in the transport sector?

Key Literature Reviews (About 3-5 papers):
Today, transport sector is an important link in people's lives when ensuring the operation of businesses and the overall economic cycle of countries. One of the important factors for the proper and efficient functioning of transport in countries is the amount of funding provided and at the same time, the creation of added value in the industry. However, the government plays a key role here. Park [1] confirms that government's policy plays a crucial role in ensuring the transport infrastructure, as its policies towards transport infrastructure contribute to creating and sustaining competitive advantage. Research by Minelgaite, Dagiliute, Liobikiene [2], which analysed urban transport usage, customer satisfaction levels and the impact of satisfaction on using public transport in the European Union (EU) countries revealed that the use of public transport in all countries is rather low and significantly depends on the level of the economic development.

It shall be noted that quality is an important determinant of competitive advantage. This affects the quality of the service and therefore each mode of transportation has a significant and independent impact on competitive advantage. This could encourage policymakers to propose infrastructure policy to acquire and enhance comparative advantage in industries in which specific modes of transportation are intensively required. [1]

Another factor necessary to ensure effectiveness is innovation. It is not very obvious to consider innovations in maritime transport, but if so, interest is in developing an integrated approach, mainly connected to environmental innovations. [3] There have been other innovations integrated as well, one of them being the Value Ramp, which describes how actors involved in Intelligent Transport System development can create added value, especially in innovation platforms such as Living Lab Bus. But again it is especially necessary to justify subsidies and investments in innovation platforms. [4]

It follows from the above that it is important to realize there are more factors that may contribute to or influence the creation of added value. Quality, innovations, proper policy decisions are vital for effective operation of industries as well as transport systems. The objective of this paper is to analyse complex added value for transport in EU countries.

Design/ Methodology/ Approach. The objective of the paper was the analysis of added value and investments in research and development. A research question was used to determine the ideal ratio of the added value and investments. For the purposes of the analysis, a regression model was selected, which enables to avoid extreme values. For the given paper, there were used data on investments in research and development in transport from 28 EU countries, as well as the data on added value generated by these countries. The data was obtained from the publicly available statistics of the European Committee for the period of 2013-2017:

1) The data on investments in research and development in the countries of EU28 in the transport sector was obtained from Eurostat (2020).
2) The data on added value generated by EU countries was obtained from the Eurostat-OECD Entrepreneurship Indicators Programme (Eurostat, 2020).

The research sample included 57,967 from the whole European Union operating in transport sector. The Statistica software, version 13.0, was used for statistical calculations. The tool used to analyse the dependence between added value and investments in R&D in the EU were artificial neural networks.

The given method is used for predicting and controlling the processes of adapting linear and non-linear functions (Didych, et al., 2018). The method of artificial neural networks contains a set of neurons (Russell and Norvig, 2020) interconnected within the network by means of weights

(Ledesma, et al., 2020). In this case, the input data for the training of the neural networks was information about investments of EU28. During the training, the weights are modified so that each input after the training is assigned an input with the closest target value (Masters, 2018). Here, multilayer perceptron networks (hereinafter referred to as MLP) will be used, which are the basic type of neural networks, and the radial basis function (RBF) based on logic. The output of the training of these networks are the predictions for investments in R&D in the transport sector.

To analyse the input data in the Statistica software, there will be used Data mining – neural networks, specifically General regression. When selecting the data, investments in R&D are an independent variable, and added value is dependent variable. The data are divided in the ratio 85:15 – the share of training to validation datasets. Using the performed analysis, it will be possible to obtain the basic statistics of the input data, i.e. the statistical data on the investment in research and development and added value. The following step consists of determining the neural network which would best describe the relationship between the dependent and independent variable. Out of 10,000 neural structures, 5 best neural networks in terms of the performance will be retained. In the case of MLP, the hidden layer contains 2 – 20 neurons, and 11 – 30 neurons in the case of RBF networks. For the activation of the input neural layer, the following functions will be considered: Logistic, Gaussian, Tanh; for the activation of the output layer of neurons, Identity and Sine will be used.

(Expected) Findings/Results: In the introductory part of the paper, the objective was to determine how investments in research and development participate in the creation of added value in the transport sector in the member states of the European Union. The objective can be achieved by means of regression analysis; neural networks are planned to be used for determining the optimal radio of the amount of investments in R&D in transport and the added value of the EU countries. A scatter plot will be used to represent which states achieved the required optimum of the funds invested in R&D. This optimum can be reached in the case the investment in the sector is lower than the generated added value.

Using this research, the authors aim to obtain the data about the EU28 countries which achieve the optimal values in the transport sector within the monitored period of 2013-2017, and to verify whether the methods of neural networks and regression analysis are suitable for predicting the optimal share of investment to added value. There should also be considered the possibility that no prediction method would be able to predict events such as ecological disaster, pandemic, or financial crisis.

The research can be applied in practice as well by entrepreneurs in the transport sector, scientists specializing in economics, added value, and investments, and individual national economies to

compare their competitiveness in terms of creating added value in the transport sector in the global market.

Research limitations/ Implications: In this part of the paper, it is important to point to the limitations of the research, which consist in the selection of research sample taken from the available Eurostat statistics. When using the input data from this source, it is necessary to consider data that was not provided by some of the EU member countries. Another limitation is the assumption that the methodology for calculating data such as added value can differ across the EU member states.

Keywords: added value, investments in research and development, transport sector.

References

1. PARK, S. Quality of transport infrastructure and logistics as source of comparative advantage. *Transport Policy 2020,*99, pp. 54-62. ISSN 0967-070X.
2. MINELGAITĖ, A.; Dagiliūtė, R.; Liobikienė, G. The Usage of Public Transport and Impact of Satisfaction in the European Union. *Sustainability* 2020, *12*, 9154.
3. KOUKAKI, T; Tei, A. Innovation and maritime transport: A systematic review. *Case Studies on Transport Policy* 2020, 8(3), pp. 700-710. ISSN 2213-624X.
4. LUSIKKA,T.; Kinnunen,T. K.; Kostiainen,J. Public transport innovation platform boosting Intelligent Transport System value chains. *Utilities Policy,*2020, 62, 100998. ISSN 0957-1787.

28.

PROBABILITY-STATISTICAL MODELS FOR ESTIMATING THE EFFICIENCY OF INVESTMENT PROJECTS

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Abstract

Purpose/ Research Question: The study investigates the main justification criteria to assess the information.

Design/ Methodology/ Approach: Profit is determined by the difference between revenue and costs. For planning, you need to know the total amount of revenue (the amount of the company's income received from the sale of products across all assortment items) TR, here you can find yourself in various situations that correspond to their own original solutions. Let us suggest one of the algorithms for solving similar problems.

Stochastic income averaging

From a mathematical point of view, the dependence of income per unit of time is determined as follows

$$TR = \int_0^\infty P(Q)dQ, \tag{1}$$

where $P(Q)$ – demand price function; Q – volume of current demand for a product.

In a competitive and dynamic market, the price and volume of demand manifest themselves as random variables, therefore, it is necessary to determine the probability of receiving revenue TR (for the given values, in general, no less). If the law of distribution of price and volume of demand is known, this probability can be estimated as a result of averaging the law of distribution of the price of demand, taking into account the distribution density (volume of demand)

$$P = \int_\Omega G(p)\varphi(p)dp, \tag{2}$$

where $G(p)$ – demand volume distribution law; $\varphi(p)$ – density of distribution of demand volume in the price of goods; Ω - domain of a random variable p .

On the other hand, based on the results of the analysis of the equilibrium state of the market, it is possible to determine the average values of the demand price m_p and demand volume m_Q.

Obviously, using demand (2), it is necessary to first select the model of the law and (or) $\int_0^p \varphi(p)dp$.

When choosing $G(p)$ it is advisable to use the principle of maximum uncertainty [1]. To describe the distribution law for the volume of the demand, we use Rayleigh distribution

$$\varphi(p) = \frac{p}{\sigma^2}\exp\left[-\frac{p^2}{2\sigma^2}\right], \tag{3}$$

where σ - is a distribution parameter uniquely determined from a sample in terms of the mean or variance.

As a measure of uncertainty, we choose Shannon's entropy (in differential form) [2].

$$\mathrm{H}_\varepsilon = -\int_0^\infty \frac{\varphi(p)G(p)}{\int_0^\infty \varphi(p)G(p)dp} \ln\left(\frac{\varphi(p)G(p)}{\int_0^\infty \varphi(p)G(p)dp}\right)dp \tag{4}$$

and solve the variational problem that provides the maximum functional (4) under additional conditions:

$$\int_0^\infty [1-G(p)]' dp = \int_0^\infty g(p)dp = 1; \tag{5}$$

$$\int_0^\infty [1-G(p)]' p\, dp = \int_0^\infty g(p)p\, dp = m_p. \tag{6}$$

And, therefore, the probability (2) with the corresponding initial data can be estimated by calculating an integral of the form

$$P = \frac{1}{c_1^*}\int_0^\infty \exp\left[\frac{\nu_2}{c_1\varphi(p)} - 1\right]dp. \tag{7}$$

The static setting is of little use for forecasting; for this, the economic characteristics must be fixed in time.

Taking into account the dynamics of supply and demand

The formalization of the process of dynamic interaction of demand and supply can be carried out in terms of the theory of queuing systems (TQS) [3]. One of the features of TQS is the probability of its being in a free state and the analytical solution for this probability can be written in the form (8). The probability of TQS being in a free state will mean the probability of the existence of unmet demand

for products of this type. Then, when servicing «with failures», the analytical solution for a given probability can be written in the form [3]

$$P(t) = \frac{\mu}{\lambda + \mu}\left\{1 + \frac{\lambda}{\mu}\exp\left[-(\lambda + \mu)t\right]\right\}, \tag{8}$$

where λ – intensity of demand for a product; μ – intensity of its satisfaction.

Dependence (8) is exponential in time and reaches a stationary solution in a steady state. To assess the effectiveness of investments, we are interested in predictive problems, therefore, of interest is the non-stationary solution domain as a function of time.

Statistical setting

Making statistical decisions is accompanied by some risks that are traditional for statistics, but specific from the point of view of the investment process (and, as a result, little studied), so having made an investment, an investor risks incurring losses due to underinvestment or due to non-consideration of part of the demand.

In accordance with the well-known provisions of the theory of statistical decision-making, making an investment of V, the investor runs the risk of incurring losses due to underinvestment with a probability

$$\alpha = \int_V^{\infty} q(x)dx \tag{9}$$

Or due to neglect of a part of demand with the probability

$$\beta = \int_V^{\infty} f(x)dx. \tag{10}$$

In statistical decisions, it is often necessary to compromise between the acceptable level of errors of the first (11) and second (10) kind, which means an equilibrium state for investments. The theory of statistical decision making on a small number of observations, at present, still needs scientific substantiation and development. At present, an approach is being developed based on the use of nonparametric statistics and elements of the theory of stochastic indication [5]. Thus, the outlined approaches to the construction of models for evaluating the effectiveness of investment projects cover a wide range of informational situations and make it possible to obtain acceptable solutions in conditions of high uncertainty with very limited information.

Reference

1. Herrera, J.; de las Heras-Rosas, C. Economic, Non-Economic and Critical Factors for the Sustainability of Family Firms. *J. Open Innov. Technol. Mark. Complex.* **2020**, *6*, 119.
2. Ivchenko B., Martyschenko L., Monastyrsky M. Theoretical foundations of information and statistical analysis of complex systems. – Saint-Petersburg, publishing house «Лань», 1997. – 320 p.

3. Ivchenko B., Martyschenko L., Ivantsov I. Informational microeconomics. Part 1. Methods of analysis and forecasting – Saint-Petersburg, publishing house «Нордмед-Издат», 1997. – 160 p.
4. Kim, D.-J.; Ji, Y.-S. The Evaluation Model on an Application of SROI for Sustainable Social Enterprises. *J. Open Innov. Technol. Mark. Complex.* **2020**, *6*, 7.
5. Mirza, N.I.; Malik, Q.A.; Mahmood, C.K. The Value of Board Diversity in the Relationship of Corporate Governance and Investment Decisions of Pakistani Firms. *J. Open Innov. Technol. Mark. Complex.* **2020**, *6*, 146.
6. Ventsel E., Ovcharov L. Probability theory and its engineering applications. – Moscow, publishing house «Наука», 1988. – 480 p.
7. Ivchenko B., Martyschenko L., Tabukhov M. Management in economic and social systems – Saint-Petersburg, publishing house «Нордмед-Издат», 2001. – 248 p.
8. Klavdiyev A., Pasevich V. Adaptive technologies of information-probabilistic analysis of transport systems. Saint-Petersburg, publishing house СЗТУ, 2009, p.305.

29.

Non-linear behavior modeling in the financial technology industry

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Abstract

Purpose/ Research Question: Measuring company performance has been one of the major issues of management theory and practice throughout the period of its development, which lead to diverse studies of approaches, methods and instruments aiming to reduce uncertainty in evaluation of companies' performance and thus provide higher quality of decision making. At the same time the origins of uncertainty in socio-economic systems still remain unclear: some of the authors claim that uncertainty is the result of financial and real sectors misbalance (Cecchetti, Kharroubi, 2015), difference in institutional development level (de Soto, 2000), irrational behavior and decision making (Ariely, 2008), and a number of other reasons. The situation is relevant not only to macrolevel, but for micro- and meso level as well: hence estimating company efficiency for a forthcoming period becomes a challenge since efficacy and efficiency of certain resources remains unclear.

One of the problems that lead to increased uncertainty of future company performance is the difference in predicting efficacy of different resources – the range of possible efficiency of these varies from a relatively small one normal for tangible assets, and a wide one that appears in case of intangible assets, especially human, organizational or cultural capital. Hence the purpose of this research is to suggest a tool to reduce uncertainty in measuring company performance by implementing instruments from natural sciences that are used to measure discrete performance of elements. To achieve this goal we check the possibility of using Heisenberg principle to evaluate uncertainty of fintech company performance to assess multilevel uncertainty present in the financial and IT-technology markets.

Key Literature Reviews (About 3~5 papers): Estimation of uncertainty level to improve quality of economic and managerial predicting models had for a long while been one of the major problems of business research. Though fintech industry is a bit of an exception, where one can find a number of justified statistical models, still their level of robustness and quality of prediction is not high enough. Analysis of existing literature reveals that the main tools used to reduce uncertainty in measuring company performance include, but are not limited to: use of factor analysis and definition of the main factors affecting the result variable (Lorsch, Allen, 1973), defining predictors of economic agents' behavior (Downey, Slocum, 1975), estimation of shocks to define probable uncertainties (Jurado, Ludvigson, 2013), use of appropriate statistical distribution (Sweeney et al., 1987) or external forecasters (Cecchetti, Kharroubi, 2015). Still, the suggested instruments, as it is proven by mentioned authors, can be used only in certain cases – while in the other situations they don't provide any effect in reducing uncertainty. Latter years studies had focused on financial industry from the different perspectives, and still existing studies are limited to application of the above-mentioned instruments; moreover, they tend to ignore such limitations of the developed models, as a fact that they don't consider irrational behavior or existence of taxes.

To solve this problem, the authors suggest to question classical economic laws, starting with the analysis of global economic system development in last 40 years shows that a number of fundamental principles of classical political economy, such as, for example, deterministic laws of supply and

demand (Goncaves, 2012) do not explain facts provided by empirical evidence. This was outlined by a number of researches, who tried to develop an alternative model of economic growth on the basis of quantum principles (Cencini, 2011; Orrell, 2018); and on the basis of their research we make the following proposal: classical political economy is based on deterministic principles, while modern economy has a quantum nature – therefore main principles of classical theory are proven in modern world only with a certain probability. As all the above mentioned statements are considered for macroeconomic level of study, we assume the same situation occurs, in our opinion, on microlevel as well, but the origins of uncertainty at this point of measurement are different. The fintech sector om this case is somewhat an extreme example – volatility of startup profitability differs significantly from company to company, indicating the need to pursue an alternative modeling approach to predict performance.

(Expected) Findings/Results: The main factor of uncertainty on a firm level is possible efficiency and efficacy of resource use – the range of their efficiency, as indicated by scholars, can be the result of resource allocation (Levinthal&Wu, 2013), quality of resource management (Atkison et al., 2007), or ensuring productivity (Swartz, 2010). However, though these finding shed lights onto possible predictors of the fintech company performance, the instruments used does not allow to define an approach to reduce uncertainty in the majority of cases – thus in this paper we evaluate the possibility of using quantum tools to evaluate resources' performance to reduce uncertainty.

Heisenberg principle states that "the position and the velocity of an object cannot both be measured exactly, at the same time, even in theory" (Heisenberg, 21927), and is considered by physicists to be a consequence of wave/particle duality that appears on microlevel of physical world.

In physics this principle applies to estimation of position and velocity of electron, and an analogue can be found in socio-economic systems when we try to measure potential (an analogue of energy/velocity) and efficiency (actual position) of companies' intangible assets. In this paper we assume that at a certain moment of time we can either measure efficiency of intangibles, or their potential. This can be formalized in the following way (see Eq. 1):

$$\Delta p * \Delta e \geq c \qquad (1)$$

p – potential of fintech company resource (per unit), points; e – fintech company resource, currency units; c – constant.

Potential of fintech company resource is measured in points as a result of expert estimation, unless theory suggests certain units to measure intangible's potential. Definition of the constant requires evaluation of big amount of data that had not been done up to date, so for the purpose of the study we assume that it is a constant, and do not aim to define its value. Thus, we propose that in a certain time one can either define the potential of intangible in terms of influencing company performance, or its efficiency; and this becomes the main reason for high uncertainty of intangibles' performance which leads to low quality of predicting models defining company performance. The core of the study is to define the method of behavior modeling by using quantum principles applied to the field of fintech companies performance modeling.

References

Ariely, D. 2008. **Predictably irrational: the hidden forces that shape our decisions**. NY: Harper Collins.

Atkinson E., Banker R., Kaplan R., Young M. 2007. **Managerial Accounting**. 3rd edition. Moscow, "Williams

Cecchetti, S., Kharroubi E. 2015. **Why does financial sector growth crowd out real economic growth?** Retrived from https://www.bis.org/publ/work490.pdf

Cencini A. 2001. **Monetary Macroeconomics**. A New Approach. New York: Routledge. pp. 63-84

de Soto, H. 2000. **The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else**. New York: Harper Collins

Downey, K., Slocum, J. 1975. **Uncertainty: Measures, Research, and Sources of Variation**. Academy of Management Journal. No 18. pp. 562-578

Goncaves, C. 2012. **Chaos and Nonlinear Dynamics in Quantum Artificial Economy**. 2012. arXiv:1202.6647v1 29Feb2012

Heisenberg, W. 1927. **"Über den anschaulichen Inhalt der quantentheoretischen Kinematik und Mechanik"**, Zeitschrift für Physik (in German) 43 (3–4): 172–198

Jurado, K., Ludvigson, S., Ng, S. 2013. **Measuring Uncertaint**y. Retrieved from http://www.econ.nyu.edu/user/ludvigsons/vol.pdf

Ighodalo Ehikioya, B.; Omankhanlen, A.E.; Osagie Osuma, G.; Iwiyisi Inua, O. Dynamic Relations Between Public External Debt and Economic Growth in African Countries: A Curse or Blessing? *J. Open Innov. Technol. Mark. Complex.* **2020**, *6*, 88.

Levinthal, D., Wu, B. 2013. Resource Allocation from Multiple Lenses: Capabilities, Incentives, and Opportunities**. . Academy of Management Proceedings**

Lorsch J., Allen S. 1973. **Managing Diversity and Interdependence: An Organizational Study of Multidivisional Firms** *(*Boston*:* Harvard University Graduate School of Business Administration, Division of Research

Orrell, D. 2018. The New Science of Money. London: Omnibus Business Center.

Tengeh, R.K.; Gahapa Talom, F.S. Mobile Money as a Sustainable Alternative for SMEs in Less Developed Financial Markets. *J. Open Innov. Technol. Mark. Complex.* **2020**, *6*, 163.

Schwarts T. 2010. **The Productivity Paradox: How Sony Pictures Gets More Out of People by Demanding Less**. Harvard Business Review, June

Sweeney, W., Kenyon, D., Kramer, R. 1987. **Toward an Appropriate Measure of Uncertainty in a Risk Programming Model***.* American Journal of Agricultural Economics, Vol. 69, No. 1, pp. 87-96

30.

An Analysis on the Effects of S&T Manpower Developing Program using System Dynamics

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Abstract

Purpose/ Research Question:
Unlike previous studies that analyze the effects of the government's human resource development (HRD) programs by using the single-linear statistical methods, this study develops a causal-based system dynamics model that explains the ripple process of policy programs by utilizing analysis and data on the characteristics of each program of major science and technology (S&T) manpower development programs. In addition, this study also differ from previous studies by analyzing system dynamics models to derive policy leverage.

Key Literature Reviews (About 3~5 papers):
The most important factor in building the ability to innovate is the excellent human resource. In recent years, the endogenous growth theory (Lucas, 1988), which emphasizes the accumulation of human capital, has been in the spotlight. However, in order to establish a system that produces manpower suitable for demand, the government should establish a manpower policy direction in various fields of science and technology by identifying the relationship between supply and demand in terms of quantity and quality of labor markets in each field of science and technology (Go & Jang, 1995). With the use of policies and an enabling environment, the government is promoting innovative activities within the economy (Egbetokun et al., 2017).
National human resource development (NHRD) is fragmented across several research streams such as HRD, public policy, and labor economics. Although there is consensus regarding the analysis of macrolevel factors such as national-level economic, political, and cultural systems, identification of micro-level factors at the organizational and individual levels can yield rich insights into the selection

of certain NHRD strategies. Alagaraja and Githens (2016) explained how countries value and build financial, industrial or manpower capabilities at the national, organizational and individual levels, and their multi-level framework can be referenced in the design, formulation and implementation of the science and technology manpower development program.

Many policy makers have discussed many issues, ways to improve and alternatives to society and have proposed many policies. However, most of the policies have met only short-term effects, resulting in unforeseen long-term problems in the system. Modern society is characterized by the complexities of functions performed by an organization and the interrelation and interdependence of the subsystems that make it difficult to solve problems in modern society. System Dynamics has been widely used to analyze industrial, economic, social and environmental systems since it was first developed by Forrester (1961). Yun et al. (2019) presented the direction of the government's policymaking to conquer the growth limits through system dynamics. We can estimate the changes through policy intervention at various levels in S&T manpower development program, and to that end, we would like to organize various policy scenarios based on systems thinking.

Design/ Methodology/ Approach:

System Dynamics is a suitable method of analysis to explain the feedback impact relationship in which the qualitative and quantitative factors, such as S&T manpower development program, are combined, and explain the evolution process of the system due to their mutual impact relationship. In this study, we would like to select representative projects to analyze within ''Plan for the intensive training of leading human resources in the 4th Industrial Revolution' and discuss how to intervene major policy variables through the exploration of various feedback loops that view the business as a system and constitute the system. Therefore, we use the systems thinking approach and system dynamics as the research methodology.

(Expected) Findings/Results:

Through this study, we can analyze how each variable affects the performance of the project by viewing the major S&T manpower development programs and the consequent ripple process as a system and drawing up loop diagrams for the major variables inherent in them. We will also be able to identify policy leverage to solve structural problems for each program.

Research limitations/ Implications:

This study has limitation that although the ripple process was derived for each S&T manpower development program and causal relationships were established among variables, the degree of influence of each variable was not quantitatively analyzed. To further our research, we plan utilize a combination of qualitative and quantitative data to further facilitate understanding of the system structure, such as project-specific ripple processes, and to supplement the numerical accuracy of

long-term forecasts.

Keywords: S&T Manpower development program. System dynamics, Feedback loop, Policy leverage

Reference

1. Alagaraja, M., & Githens, R. P. (2016). Capacity and capability building for national HRD: A multi-level conceptual framework. Human Resource Development Review, 15(1), 77-100.

2. Egbetokun, A., Oluwadare, A. J., Ajao, B. F., & Jegede, O. O. (2017). Innovation systems research: An agenda for developing countries. Journal of Open Innovation: Technology, Market, and Complexity, 3(4), 25.

3. Forrester, J. W. (1994). System dynamics, systems thinking, and soft OR. System dynamics review, 10(2-3), 245-256.

4. Go, S. W., & Jang, J. G. (1995). A Schematic Model for the Demand and Supply of Science and Technology Personnel Considering Quality Level and Policy Direction for Science and Technology Personnel. Science & Technology Policy, 5(4), 73-83.

5. Lucas Jr, R. E. (1988). On the mechanics of economic development. Journal of monetary economics, 22(1), 3-42.

6. Yun, J. J., Park, K., Hahm, S. D., & Kim, D. (2019). Basic income with high open innovation dynamics: The way to the entrepreneurial state. Journal of Open Innovation: Technology, Market, and Complexity, 5(3), 41.

31.

Factors affecting the Perception of Innovative Technology: The Role of Digital Literacy

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Introduction

Digital literacy, as a literary ability for digital technology, has attracted attention as a critical variable for measuring and influencing the digital divide(Jung, 2017; van Dijk, 2006).

The underprivileged who are experiencing the information gap face various difficulties.

Economic inequality: inability to use the information productively

Political inequality: difficulty in forming social discourse online

So, reducing the digital divide has become an essential part of policy efforts to reduce social inequality.

The unequal spread of digital devices and the information gap present a risk of deepening and structuring other social inequalities(Chung, 2018).

Also, the information gap has a nature that is difficult to resolve naturally and requires a systematic and institutional response(Haywood, 1998; Wresch, 1996; Perelman, 1998)

In introducing new technologies and innovations to society, there are many cases in which the prospects and attitudes to technologies and innovations determine the success of introducing new technologies and innovations.

As a typical approach to measuring the acceptance of information technology, the Technology Acceptance Model (TAM) is widely used, which provides implications for accepting new technologies(Davis, 1989).

This study notes that the digital literacy approach can further expand in terms of the information gap, affecting attitudes and perceptions of new technology adoption.

Improving digital literacy can have a wide range of effects that can affect not only digital integration but also innovation across society.

This study aimed to recognize digital literacy, which means the literacy ability of digital technology, and the perception of social innovation, which can be the foundation of the stable introduction of innovative technology.

This study highlights the importance of digital literacy as a step-by-step approach to digital literacy.

This study used the 2018 Korea Media Panel Survey conducted by the KISDI(Korea Information Society Development Institute).

Literature Review – Digital Literacy

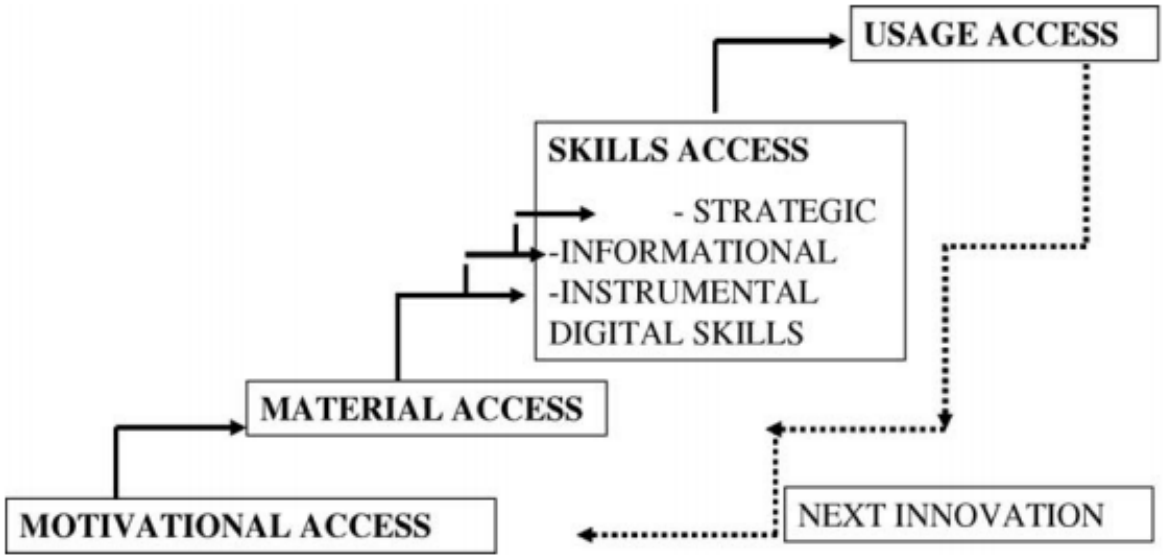
A. Digital Literacy

In the dictionary, literacy means 'an ability to read and write.'

This notion of literacy has evolved into the concept of functional abilities and applications needed in the professional domain by merely expanding the ability to read and write characters(Gottfrdon, 1997; Freire&Macedo, 1987; Sung, 2014).

The concept of digital literacy is being used to use digital technology as when and how to use it(Bailey & Ribble, 2007).

Similar concepts such as information literacy, computer literacy, and e-literacy are used.



*van Dijk (2005)

An increasing number of researchers suggest going 'beyond access' to reframe the digital divide's overly technical concept and pay more attention to social, psychological, and cultural backgrounds(van Dijk, 2006).

This study notes that digital literacy can affect the perception of the introduction of new technologies.

With the advent of the information society, many negative aspects of technology are also emphasized.

A representative example of the negative side resulting from the introduction of information technology recognizes personal information risks such as personal information leakage(Kim&Choi, 2019).

The purpose of this study is to expand the above discussion and examine the influence of digital literacy on how innovative technology affects life and how innovative technology is regarded as a technology for human life.

Hypothesis 1: Digital literacy has a positive (+) effect on the perception of the Innovative technology.

Hypothesis 1-1: Material access to digital technology has a positive (+) effect on the

perception of the Innovative technology.

Hypothesis 1-2: Skills access to digital technology has a positive (+) effect on the perception of the Innovative technology.

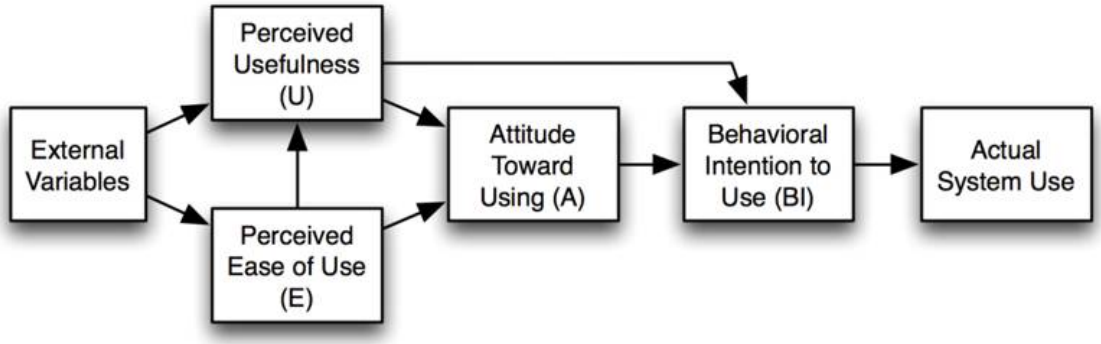
Hypothesis 1-3: Usage access to digital technology has a positive (+) effect on the perception of the Innovative technology.

B. Technology Acceptance

Technology Acceptance Model (TAM; Davis, 1989) is based on the Theory of Reasoned Action (TRM) theoretically and is used in various fields based on theoretical validity and scalability.

It clearly shows the intention and attitude of the individual to use the new technology.

The technical acceptance model describes the behavioral intention to use as a function of perceived ease of use and perceived usefulness.



* Davis, Bagozzi & Warshaw (1989)

The technology acceptance model has been studied as a modified form of model that adds not only the perceived convenience and perceived usefulness aspects but also other resource variables, recognition of innovation, and awareness of risk (Taylor&Todd, 1995; Venkatesh&Davis, 2000).

In this study, we examine the effects of three aspects of digital literacy on the recognition and familiarity with the Innovative Technology

Hypothesis 2: Digital literacy has a positive (+) effect on recognizing innovative technology.

Hypothesis 2-1: Material access to digital technology has a positive (+) effect on recognizing innovative technology.

Hypothesis 2-2: Skills access to digital technology has a positive (+) effect on recognizing innovative technology.

Hypothesis 2-3: Usage access to digital technology has a positive (+) effect on recognizing innovative technology.

Hypothesis 3: Digital literacy has a positive (+) impact on the familiarity with the innovative technology.

Hypothesis 3-1: Material access to digital technology has a positive (+) impact on the familiarity with the innovative technology.

Hypothesis 3-2: Skills access to digital technology has a positive (+) impact on the familiarity with the innovative technology.

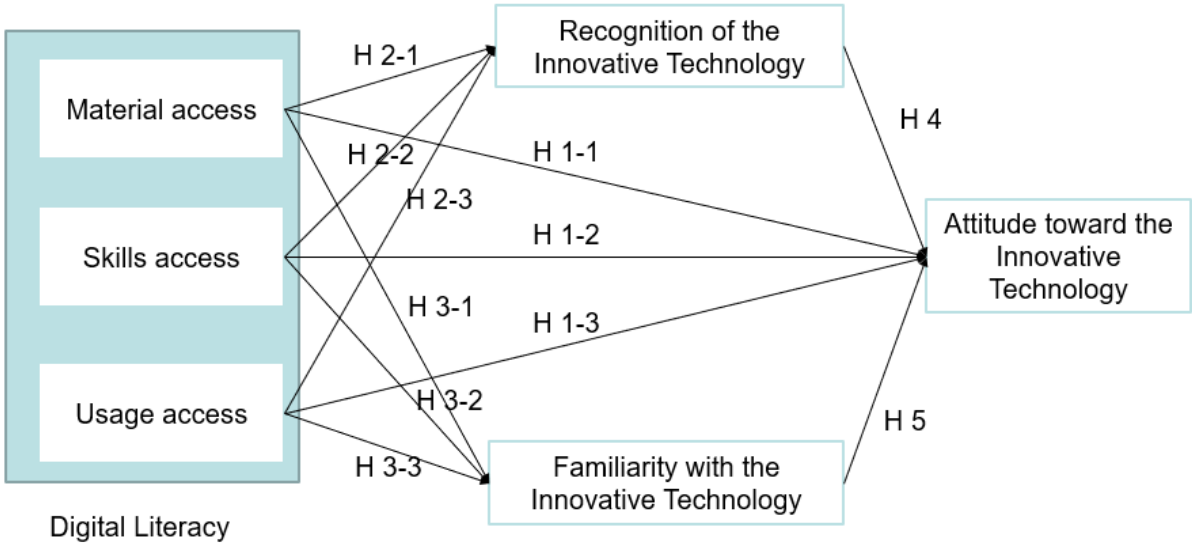
Hypothesis 3-3: Usage access to digital technology has a positive (+) impact on the familiarity with the innovative technology.

This study examines innovative technology's perception and attempts to take a modified approach to the technology acceptance model.

The following research hypothesis is confirmed by looking at the perceived usefulness of the traditional technology acceptance model as recognition with the innovative technology and a familiarity with the innovative technology.

Hypothesis 4: Recognition of innovative technology has a positive (+) effect on the perception of innovative technology.

Hypothesis 5: Familiarity with innovative technology has a positive (+) effect on the perception of innovative technology.



The empirical results of this study will confirm that users with high digital literacy positively perceive innovative technology.

when digital literacy is divided into material access, skills access, and usage access, material access has no significant impact on the innovative technology.

It may imply that digital literacy policies that focus only on digital devices' access are not right.

In conclusion, this study's results will suggest that aspects of utilization capability are more important than the dissemination of digital devices.

REFERENCES

Bailey, G., & Ribble, M. (2007). Digital citizenship in schools. Eugene, OR: International Society for Technology in Education.

Chung, C.S. (2018). 2018 Electronic Government.

Davis, F. D. (1989). "Perceived usefulness, perceived ease of use, and user acceptance of information technology", MIS Quarterly, 13 (3): 319–340.

Dinev, T., & Hart, P. (2006). An extended privacy calculus model for e-commerce transactions. Information systems research, 17(1), 61-80.

Filippini, R., Marescotti, M. E., Demartini, E., & Gaviglio, A. (2020). Social Networks as Drivers

for Technology Adoption: A Study from a Rural Mountain Area in Italy. Sustainability, 12(22), 9392.

Freire, P., & Macedo, D. (2005). Literacy: Reading the word and the world: Routledge.

Gómez-García, G., Hinojo-Lucena, F. J., Cáceres-Reche, M. P., & Ramos Navas-Parejo, M. (2020). The Contribution of the Flipped Classroom Method to the Development of Information Literacy: A Systematic Review. Sustainability, 12(18), 7273.

Gottfredson, L. S. (1997). Why g matters: The complexity of everyday life. Intelligence, 24(1), 79-132.

Haywood, Trevor. (1998). Cyberspace Divide: Equality, Agency and Policy in the Information Society. Routledge : 19 ~ 34.

Huang, X., Ma, L., Li, R., & Liu, Z. (2020). Determinants of Innovation Ecosystem in Underdeveloped Areas—Take Nanning High-Tech Zone in Western China as an Example. Journal of Open Innovation: Technology, Market, and Complexity, 6(4), 135.

Jung, J. (2017). A Study on Influencing Factors on Mobile Internet Usage Level and the Policy Implications to Eliminate the Digital Divide. The Korea Association for Policy Studies, 26(1), 151-176.

Kim, S., & Choi, S., (2019) The Influence of Digital Literacy on Privacy Concern. Korean Society and Public Administration, 30(2), 257-284.

Liao, C., Liu, C.-C., & Chen, K. (2011). Examining the impact of privacy, trust and risk perceptions beyond monetary transactions: An integrated model. Electronic Commerce Research and Applications, 10(6), 702-715.

OFCOM. (2004). Ofcom's strategy and priorities for the promotion of media literacy.

Park, E., & Lee, J. W. (2015). A study on policy literacy and public attitudes toward government innovationfocusing on Government 3.0 in South Korea. Journal of Open Innovation: Technology, Market, and Complexity, 1(2), 23.

Perelman, M. (1998). Class Warfare in the Information Age. St. Martin's Press.

Schwab, K. (2017). The fourth industrial revolution. Currency.

Sung, W. (2014). A Study on Digital Literacy and Digital Divide in the Smart Society. Korean society and public administration, 25(2), 53-75.

Taylor, S., & Todd, P. (1995). Decomposition and crossover effects in the theory of planned behavior: A study of consumer adoption intentions. International journal of research in marketing, 12(2), 137-155.

Valantinaitė, I., & Sederevičiūtė-Pačiauskienė, Ž. (2020). The Change in Students' Attitude towards Favourable and Unfavourable Factors of Online Learning Environments. Sustainability, 12(19), 7960.

van Dijk, J. A. (2006). Digital divide research, achievements and shortcomings. Poetics, 34(4-5), 221-235.

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. Management science, 46(2), 186-204.

Wresch, W. (1996). Disconnected : Haves and Have-Nots in the Information Age. New Brunswick.

32.

Diffusion of Policy Innovations: Militarization of Cyber Security in South Korea and Japan

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Purpose/ Research Question

The purpose of this study is to identify and explain the militarization of cyberspace using the diffusion and innovation theory. This study focuses on the phenomenon of the worldwide diffusion of cyberspace militarization over the last ten years. As mentioned above, one of the main features of cyberspace is uncertainty. Nevertheless, many countries recognize cyberspace as a new territory for the waging of war. Moreover, many countries have begun to adopt similar military policies, all of which converge on the militarization of cyberspace. This study considers the adoption of cyber military organizations by state actors as the diffusion of cyberspace militarization. Therefore, it focuses on verifying the militarization of cyberspace empirically through case studies of the adoption of cyber military organizations at the national level.

The establishment of a new military organization is generally evaluated as a powerful indicator in military diffusion research, because it is regarded as a high-level innovation that is superior to the adoption of technology or other operations (Horowitz 2010, 27). Previous literature has indicated that the change in perceptions of cyberspace has occurred over the last ten years (Klimberg 2012, 20; Cirlig 2014, 3). During that period, countries have defined cyberspace as a territory where war is waged, and cybersecurity has become one of the major

areas of priority in national security strategies. The research unit of this study is the national level.

This paper analyzes the establishment of cyber military organizations in South Korea and Japan. South Korea is classified as an early adopter and Japan is classified as a late adopter of cyber military organizations in this study. We analyze the causal relationship underlying the adoption of cyber military organizations in both countries. We ask and answer a set of research questions:

RQ: Why is cyberspace militarization spreading around the world?

Sub-RQ. What interactions and causal relationships occur in adopting the policy within a country?

Key Literature Reviews

Most studies explain military innovation and diffusion by focusing on international factors. However, internal factors have been underestimated in military innovation studies. It is only more recently that some studies have tried to explore military innovation through internal factors. These studies present the following arguments in support of relying on internal factors.

Term	Definition or Characteristics	Author
Military Innovation	It is defined as major changes in the conducting of warfare, related to leading military organizations. It designed to increase efficiency capabilities.	Horowitz (2010)
Military Diffusion	It is the spread of a technology or behavior from one military to another.	Junio 2012

First, the dynamics of various internal factors lead to changes in society, which, in turn affects military innovation. Second, certain internal factors trigger military innovations more

rapidly than others. These internal factors include domestic politics, economy, society and culture, technology, and military organizations. Military innovation studies in recent times tend to explain military innovation as a result of the combination of international and internal factors. For example, Farrell (2002) analyze how cultural norms, domestic politics, and new technologies affect military innovation. Horowitz (2010) examines the diffusion of military power across the international system and explains how the factors causing military innovation affect international politics. He argues that financial resources and organizational changes affect decisions concerning military innovation in individual countries (Horowitz 2010, 208-210). Goldman (2006) shows how domestic political structures and cultures influence the adoption of military technology and ideas through four regimes, namely the late-Ottoman and Kemalist regimes in Turkey, and the late-Tokugawa and Meiji regimes in Japan.

Design/ Methodology/ Approach

The primary approaches to analyze the qualitative part of this study are the qualitative case study method of structured, focused comparison and process tracing.

The structured, focused comparison method has two characteristics. First, the method suggests a common and standardized question in each case. This method is structured to answer the research questions through the accumulation of comparative analysis. Second, this method focuses on dealing with only a specific part of the historical event adopted as a case.

This study also uses process tracing. Process tracing is one of the most commonly used qualitative methods in policy diffusion research. Process tracing has two characteristics. First, it identifies the causal mechanism that intervenes between the results of independent variables and dependent variables (George and Bennett 2005, 199). Second, it focuses on understanding theoretical hypotheses, study implications and the causal relationship of selected cases through

archival research, historical background, and interviews.

Then how does process tracing support the policy diffusion and innovation analysis? First, it traces the policy decision process and idea spreading through the historical background. Second, it detects traces of theoretical mechanisms. According to Stake, in case of policy diffusion research using process tracing method, decisive evidence and the specification of the mechanism determines the success of the study (Starke 2013, 674).

Based on the qualitative analysis framework, this study collects historical background and archival materials related to the adoption of cyber military organizations in both countries. Through the analysis of the collected data, this study focuses on understanding the mechanisms and the theoretical implications. All of the data sources are based on public information. Initial data collection starts with a review of archived materials such as official documents from online Japanese and South Korean government agencies. This study also used the most common data sources, such as academic papers, media, and the international institute report.

Findings/Results

From the analysis we confirm the results in the context of both the regional influence variable and the other policies variable, and confirm both variables had significant impacts on both countries even in the qualitative analysis. This study can also see that the cyber incident catalyzed South Korea's decision, while Japan's alliance with the US encouraged it to establish a cyber military organization.

Value	South Korea	Japan
Major actor	Lee Myung-bak administration Ministry of National Defense (DOD)	Abe administration Liberal Democratic Party (LDP)
Policy adoption	January 1, 2010	March 26, 2014

Initial condition	As part of the Amendment of Military Reform Plan 2020, it aims to establish Cyber Command until 2012 Frequent cyber attacks in the confrontation with North Korea	Recognizing the Importance of cybersecurity through 7.7 DDoS attack case Increasing cyber attacks Changes in the information security policy direction As a part of foreign policy, beginning to strengthen cyber cooperation with the US
Motivation	7.7 DDoS attack of 2009	Strengthening military alliance with the US
Main contents	The established CWC in size of 350 people in 2010	The established CDU in size of 90 people in 2014
Diffusion mechanism	Institutional environment Cyber incidents Regional environment	Bandwagon effect Cyber incidents Regional environment

Research limitations/ Implications:

This study analyzed the cases of South Korea and Japan to explain the adoption of cyber military organization. The case study of South Korea and Japan have received minimal policy attention, especially in comparison with the reams of outputs devoted to the U.S. and China surrounding cyber conflicts in East Asia.

Comparison analysis and process tracing are used for each case to establish the existence of the innovation and evaluate the extent to which diffusion processes governed the specific strategic choices of critical states.

The data collection of this study is limited by countries available. Recently, several countries announced their long-term plans to combine separate cyber military organizations into a Cyber Command. However, this study did not capture those organizational change processes. Besides, the qualitative research of this study analyzed only the cases of South Korea and Japan. The generalization of the finding is limited.

Keywords: Cyber Security, Militarization, Policy Diffusion and Innovation

Reference

Cirlig, C. C. (2014). *Cyber Defence in the EU: Preparing for Cyber Warfare?*. European Parliamentary Research Service.

Horowitz, M. C. (2010). *The diffusion of military power: Causes and consequences for international politics.* Princeton, NJ: Princeton University Press.

George, A. L., Bennett, A., Lynn-Jones, S. M., & Miller, S. E. (2005). *Case studies and theory development in the social sciences.* Cambridge, MA: MIT Press.

Goldman, E. O. (2006). Cultural foundations of military diffusion. *Review of International Studies, 32*(1), 69-91.

Farrell, T., & Terriff, T. (Eds.). (2002). *The sources of military change: Culture, politics, technology*. Boulder, CO: Lynne Rienner Publishers.

Junio, T. (2016). Marching Across the Cyber Frontier: Explaining the Global Diffusion of Network-centric Warfare. *In Cyberspaces and Global Affairs* (pp. 76-100). New York, NY: Routledge.

Starke, P. (2013). Qualitative methods for the study of policy diffusion: Challenges and available solutions. *Policy Studies Journal, 41*(4), 561-582.

33.

How to Shorten Innovation Lead Time in International Joint Ventures: Assessing the Effects of Ownership Balance

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ABSTRACT

International joint ventures (IJVs) have long been considered an effective means of innovation. Several, if not many, studies have examined the impact of IJVs on innovation but neglected the initial stage of IJV formation and focus merely on innovation output. This study fills this gap by shifting attention to the time needed for R&D efforts to generate the first innovation output since IJV formation or "innovation lead time." Drawing on the literature on the control structure of IJVs, we argue that ownership balance reduces innovation lead time and that foreign managerial control, cultural distance, timezone difference, and lack of organizational slack weaken this negative relationship. Using the panel data of 48 IJVs in Korea during the periods between 2000 and 2016, we find empirical support for these arguments. This study contributes to the literature by showing how IJVs can reduce innovation lead time and weather the liability of newness in the initial period of formation in the high-velocity environments.

KEYWORDS: International Joint Ventures; Innovation Lead Time; Control Structure; Ownership Balance; Liability of Newness

34.

Do strategic alliances really benefit firms? A distinction between successful and failed alliances

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Abstract

Purpose/ Research Question: Given that firms often engage in multiple strategic alliances at the same time, this paper aims to examine the role of alliance portfolio management capability as a determinant of firms' overall likelihood of alliance success of its alliance portfolio and ultimately in enhancing firm performance.

Key Literature Reviews: In the face of increasingly competitive environments, firms are actively adopting strategic alliances as a valuable strategic tool for enhancing firm competitiveness (Schilke & Goerzen, 2010). Since strategic alliances can enhance the competitive advantage of firms only when they are successful in the long run, much of the prior research has focused on measuring the outcomes of individual strategic alliances (Christoffersen, Plenborg, & Robson, 2014). Other scholars have gone on to examine why some firms are able to achieve alliance success better than other competitors (Kale, Dyer, & Singh, 2002; Reuer & Ragozzino, 2006; Schilke & Goerzen, 2010).

At the same time, it is not uncommon for firms to have multiple strategic alliances operating simultaneously (Liang & Shao, 2019). As a result, firms must be able to achieve success in its overall set of strategic alliances. Being able to effectively manage more than one alliance relationships at the same time is a critical ability for firms adopting interfirm cooperative measures (Cabello-Medina, Carmona-Lavado, Cuevas-Rodriguez, 2019). Thus, alliance portfolio management capability is recognized as a key capability that firms should possess in order to be successful in adopting interfirm cooperative strategies (Castro & Roldan, 2015; Han, Chen, & Deng, 2018; Hoffmann, 2007). Defined as a firm's capability to manage its entire set of alliances, alliance portfolio management capability is bathat a firm must be able

to reach its final strategic goal by successfully managing its overall portfolio of alliances rather than focusing on the success or failure of its individual alliances (Hoffman, 2007).

Although the importance of alliance portfolio management capability has begun to attract attention in the literature (Castro & Roldan, 2015; Han, Chen, & Deng, 2018; Hoffmann, 2007), its role in enhancing the firms' overall success in its alliance portfolio and ultimately its performance has not yet been fully explored.

Design/ Methodology/ Approach: Alliance portfolio management capability will be measured using key network indices (e.g., density, brokerage) that are measured from the overall alliance network. Overall likelihood of alliance success will be measured at the level of firms' alliance portfolio. Although the specific measurement of firm performance is still under discussion, we plan to adopt several different measurements of performance in order to increase validity of our results.

(Expected) Findings/Results: We expect to find alliance portfolio management capability to increase the likelihood of alliance portfolio success and eventually lead to an increase in firm performance.

Research limitations/ Implications: By studying firms' strategic alliances at the portfolio level, we aim to go beyond a narrow focus on individual alliances implemented by firms. Instead, this paper explores firms' alliance portfolio in order to determine the key antecedent to alliance portfolio success (i.e., alliance portfolio management capability) and the effect of such alliance portfolio success on firm performance.

Keywords: Strategic alliance, alliance portfolio management capability, alliance success, firm performance

References

Cabello-Medina, C., Carmona-Lavado, A. & Cuevas-Rodriguez, G. (2019). A contingency view of alliance management capabilities for innovation in the biotech industry. *BRQ Business Research Quarterly*, doi: https://doi.org/10.1016/j.brq.2019.01.002.

Castro, I. & Roldan, J. L. (2015). Alliance portfolio management: Dimensions and performance. *European Management Review*, 12(2), 63-81.

Christoffersen, J., Plenborg, T., & Robson, M. J. (2014). Measures of strategic alliance performance, classified and assessed. *International Business Review*, 23(3), 479-489.

Han, W., Chen, F. W., & Deng, Y. (2018). Alliance portfolio management and sustainability of entrepreneurial firms. *Sustainability*, 10, 3815.

Hoffmann, W. H. (2007). Strategies for managing a portfolio of alliances. *Strategic Management Journal 2007*, 28(8), 827-856.

Kale, P., Dyer, J. H., & Singh, H. (2002). Alliance capability, stock market response, and long-term alliance success: the role of the alliance function. *Strategic Management* Journal, 23(8), 747-767.

Liang, J. & Shao, P. (2019). Sequential alliance portfolios, partner reconfiguration and firm performance. *Sustainability*, 11, 5904.

Luvinson, D. & De Man, A. P. (2015). Firm performance and alliance capability: The mediating role of culture, *Management Decision*, 53(7), 1581-1600.

Reuer, J. J. & Ragozzino, R. (2006). Agency hazards and alliance portfolios. *Strategic Management Journal*, 27(1), 27-43.

Schilke, O. & Goerzen, A. (2010). Alliance management capability: An investigation of the construct and its measurement. *Journal of Management*, 36(5), 1192-1219.

35.

Live commerce platform and consumer purchase behavior

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Abstract

As mobile networks and smartphones are in full swing, the live commerce platform, a new form of e-commerce, has experienced explosive growth and is gradually becoming a way of life for people. Live broadcasting has transformed traditional communication in many ways. The format has changed from traditional graphics and recorded audio and video to real-time video, and the types of information that can be conveyed to content through live broadcasting have become more diverse. From a business model point of view, it has changed the way suppliers and consumers communicate. (成也 et. al 2017) Since 2016, e-commerce platforms have begun to evaluate the profitability of live commerce gradually, and simple manipulation of live web pages and shopping pages to facilitate e-commerce and digital economy by leveraging the benefits. Deployed a new "live commerce" model to connect. After Taobao Live started operating and proved its commercial value, other overseas e-commerce platforms also began exploring new live commerce models such as Amazon Live (US) and Bulbul (India), which began operating in 2019.

In recent years, external conditions such as technology, policy and business environment have gradually matured, and the live industry has been steadily developing. According to the '46th China Internet Development Status Statistical Report' released by the China Internet Network Information Center (2020), as of June 2020, the number of Chinese Internet live viewers reached 562 million, more than half of the total number of Internet users. Among them, live commerce platform users accounted for 32.9% of the total Internet users with 391 million users. The ``2020 Taobao Live New Economy Report'' emphasized that 2019 is the year of the explosive growth of Taobao Live. The growth rate of live transaction volume, number of live accounts, the average number of products per day, average number of viewers per day, duration of the average number of viewers per day has exceeded 100%. It is the fastest-growing form of e-commerce in recent years. In early 2020, due to the impact of Corona 19, offline life such as consumption, education, and work is stagnating. Live once again entered the public's view and penetrated all life more comprehensively, including live commerce and live classrooms. Corona 19 has promoted the development of live commerce to some extent and has accelerated the vitality of many traditional industries.

The composition of this study is: First, through consideration of existing studies, variables that can affect the acceptance of the live commerce platform are examined, and second, the structural influence between the construct factors and the corresponding research hypotheses are established. Third, the structural equation model (SEM) was used for factor analysis and reliability verification to verify the research hypothesis and structural model analysis. Finally, through the analysis of the structural equation model, the path between factors influencing the acceptance of the social network game was analyzed and verified to provide an interpretation of the model, practical implications and conclusions, and a future research direction. This study provides a comprehensive understanding of the factors and mechanisms that influence consumers' purchasing behavior in a live commerce platform, and platform providers more comprehensively understand the functional and social factors that are important for consumers to purchase on the platform. It can be used as a basis for helping consumers improve the platform, provide consumers with a good consumption experience, and provide theoretical support for consumers to use related services rationally and efficiently. I would like to do a theoretical study on the operation and management of a live commerce platform.

Keywords: Live commerce, platform, consumer purchase behavior, SEM

Reference

Agarwal, R., & Karahanna, E. (2000). Time flies when you're having fun: Cognitive absorption and beliefs about information technology usage. MIS quarterly, 665-694.

Aghdaie, S. F. A., Piraman, A., & Fathi, S. (2011). An analysis of factors affecting the consumer's attitude of trust and their impact on internet purchasing behavior. International Journal of Business and Social Science, 2(23).

Cai, J., & Wohn, D. Y. (2019, January). Live streaming commerce: Uses and gratifications approach to understanding consumers' motivations. In Proceedings of the 52nd Hawaii International Conference on System Sciences.

Cao, M., Zhang, Q., & Seydel, J. (2005). B2C e-commerce web site quality: an empirical examination. Industrial Management & Data Systems.

Chen, L. D., & Tan, J. (2004). Technology adaptation in e-commerce:: key determinants of virtual stores acceptance. European Management Journal, 22(1), 74-86.

Eisenmann, T., Parker, G., & Van Alstyne, M. W. (2006). Strategies for two-sided markets. Harvard business review, 84(10), 92.

Erkan, I., & Evans, C. (2016). The influence of eWOM in social media on consumers' purchase

intentions: An extended approach to information adoption. Computers in Human Behavior, 61, 47-55.

Fishbein, M. (1975). Ajzen. i.(1975). Belief, attitude, intention and behavior: An introduction to theory and research.

Fishbein, M., & Ajzen, I. (1980). Predicting and understanding consumer behavior: Attitude-behavior correspondence. Understanding attitudes and predicting social behavior, 148-172.

Ganesh, J., Reynolds, K. E., Luckett, M., & Pomirleanu, N. (2010). Online shopper motivations, and e-store attributes: an examination of online patronage behavior and shopper typologies. Journal of retailing, 86(1), 106-115.

Kim, J. (2018). Platform adoption factors in the internet industry. Sustainability, 10(9), 3185.

Koufaris, M., Kambil, A., & LaBarbera, P. A. (2001). Consumer behavior in web-based commerce: an empirical study. International journal of electronic commerce, 6(2), 115-138.

Kuo, Y. F., Wu, C. M., & Deng, W. J. (2009). The relationships among service quality, perceived value, customer satisfaction, and post-purchase intention in mobile value-added services. Computers in human behavior, 25(4), 887-896.

Kyoung, L. (2014). A research on user's acceptance behavior on mobile travel app based on UTAUT model. Fujian, Xiamen University.

Li, C. Y. (2013). Persuasive messages on information system acceptance: A theoretical extension of elaboration likelihood model and social influence theory. Computers in Human Behavior, 29(1), 264-275.

Liébana-Cabanillas, F., Marinković, V., & Kalinić, Z. (2017). A SEM-neural network approach for predicting antecedents of m-commerce acceptance. International Journal of Information Management, 37(2), 14-24.

Limayem, M., & Khalifa, M. (2000, July). Business-to-consumer electronic commerce: A longitudinal study. In Proceedings ISCC 2000. Fifth IEEE Symposium on Computers and Communications (pp. 286-290). IEEE.

Zhou, T., & Li, H. (2014). Understanding mobile SNS continuance usage in China from the perspectives of social influence and privacy concern. Computers in Human Behavior, 37, 283-289.

36.

Institutional pressures and firm performance: Mediating role of ESG and Moderating role of CEO leadership

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Abstract:

1.1 Research Question

1) What is the level of institutional pressure from Chinese society and stakeholders on sustainability management?

2) Is CEO's transformative leadership an effective way to respond to institutional pressure on corporate social responsibility?

3) Does the CEO's response to institutional pressures help strengthen ESG activities and improve financial performance?

1.2 Research motivation

- Sustainable management includes a variety of issues that are getting more and more attention from academia, industry and policy makers, from traditional issues related to labor to cultural issues that reflect regional characteristics, ethics and environmental issues.

- The importance of a company's sustainable management activities has been emphasized on the basis of various theories such as the Transaction Cost Theory (TCE) and the Resource Dependency Theory (RDT), which specifically argues that an organization may face institutional pressure, normative pressure, and imitative pressure, and that these pressures can serve as an incentive to strengthen a

company's specific behavior in order to secure legitimacy from society.(DiMaggio and Powell, 1983, Yigitbasioglu, O. M. 2015).

- Institutional pressures may result in firms adopting specific policies in relation to obtaining legitimacy and securing external resources to improve corporate performance.(Di Maggio & Powell, 1983; Porter & Kramer, 2006; Selznick, 1996).

1.2 Research motivation

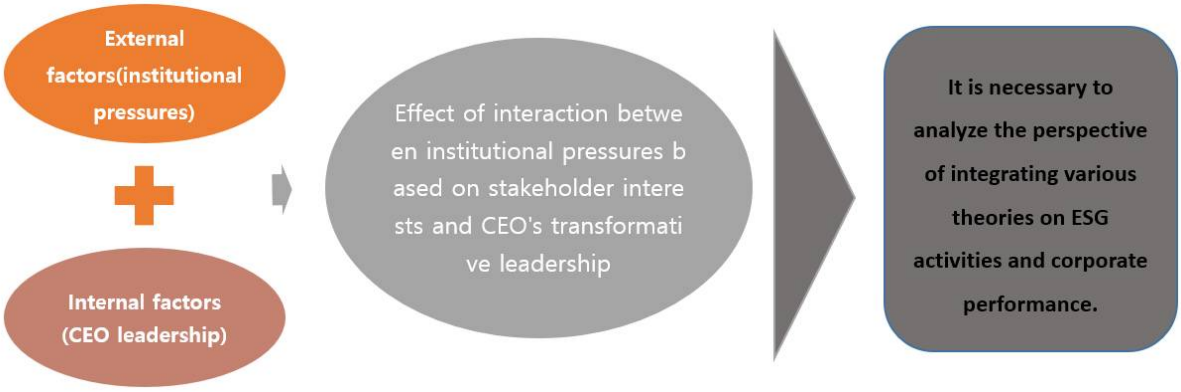
- With the recent increase in institutional, conventional, and imitative pressure on companies to improve their non-financial performance, ESG-related activities have been increasing, which is believed to have a significant impact on their financial performance.
- Under the market system, companies take into account the relative cost and efficiency, and act by reflecting various risks from the institutional environment.(Oliver, 1991; Tan and Wang, 2011, Weick, 1979).
- Chinese companies are facing pressure from various stakeholders due to a unique mix of political elements of the socialist system and economic elements of the market opening system, which raises the importance of an analysis linking ESG activities in relation to Chinese companies' market expansion or performance.
- The Chinese government promoted privatization of enterprises to strengthen industrial competitiveness, but in privatized enterprises, the strategic decision-making of the CEO acts as a factor that can have a significant influence on the improvement of corporate competitiveness.

1.2 Research motivation

- The biggest change in China's social responsibility management in recent years is that the voluntary participation of companies is increasing, not only government initiatives. Behind this change is the change of consciousness of Chinese top executives.
- However, studies on the relationship between institutional pressure and corporate performance for Chinese companies and the impact of managerial leadership on

corporate performance through ESG activities are very insufficient.

- Therefore, we propose a research model that considers the characteristics of managers together with the institutional pressures caused by the unique environment facing Chinese companies and the impact of ESG activities on performance, and conducts an empirical analysis based on the contents of the survey.
- An empirical analysis of the survey data analyzes the research model in which institutional pressures related to corporate social responsibility in the Chinese market take into account the impact of corporate ESG activities on financial performance along with the characteristics of the chief executive officer.



- According to the theory of new institutionalism, companies are influenced by the external environment or other companies by institutional isomorphization(DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Scott, 2007).

* Institutional isomorphization refers to a phenomenon in which the behaviors or related systems between companies become similar to each other due to various external factors.

- In recent studies, it is also used as a meaning of institutional pressure on the impact of organizational change and innovation.
- According to institutional theory, organizations are constantly dependent on external resources because they cannot be self-sufficient with all the resources they need to operate(Pfeffer and Salancik, 2003).

- Therefore, companies need to respond to stakeholder pressure to acquire resources, and carry out sustainability management activities as a means to obtain legitimacy from various stakeholders(Frederick, 1994; Lamin and Zaheer, 2012; Oliver, 1991; Rathert, 2016; Tian, Liu and Fan, 2015).
- Institutional theory emphasizes the influence of external agencies on business behavior(Hoffman, 1997).
- It is argued that corporate social goals are not always profit maximizing and their activities often satisfy external pressures for legitimacy(Chen, Y. S et al, 2012).

Institutional theory focuses not on mere rational economic decisions, but on how external norms, social characteristics and external environment shape corporate behavior.

Behavior that meets social expectations and norms can strengthen or protect legitimacy.

Thus, this pressure on legitimacy affects corporate behavior.

Three types of institutional pressure (coercive, normative and mimetic) influence the decision making of a company's sustainability management activities (DiMaggio and Powell, 1983; Sarkis et al., 2011).

Sustainable management can be said to be a management paradigm that pursues sustainable development by integrating all business activities of a company based on economic profitability, environmental soundness, and social responsibility(남상민, 2009).

Corporate 'social activities' are developing into the concept that companies should return part of their profits voluntarily to society in various ways, and in the past social responsibility was not necessarily a responsibility that companies must fulfill, such as economic responsibility, legal and ethical responsibility, but today it has become an important area of business activity(Brown and Dacin, 1997).

As companies that fulfill their environmental soundness and social responsibilities can perform sustainable management, they can expect balanced development of businesses and society.

'Environmental activities' of sustainability management are mentioned as important activities for a company to survive continuously, and it is that these environmental activities

have become important. The main reason is facing a new crisis called the environmental crisis on Earth

Based on RBV, leadership is regarded as an important resource in the organization's environmental management(Zhou et al., 2018; Guest and Teplitzky, 2010).

The CEO's leadership is affected by boundless responsibilities, authority and numerous situational factors. This is an activity that affects people's willingness to achieve their goals, and the ability to influence an organization to achieve them.

Leaders are recognized for their role in reforming, redesigning and reorganizing organizations for sustainable development(Hawken, 1993).

In general, investigations into the needs of leaders for sustainable development focus on the characteristics and skills of leaders. Focus on leadership of leaders in this study.

Burns (1978) and Bass (1985) distinguished transformative and transactional leadership.

Hypothesis 1: The interaction of institutional pressure with CEO's transformative leadership will have a positive impact on corporate performance.

Hypothesis 2: The interaction between institutional pressure and CEO leadership will have a positive impact on the improvement of corporate sustainability (ESG).

Hypothesis 3: Interaction between institutional pressure and CEO transformative leadership will have a positive impact on improving corporate performance by mediating ESG activities.

Reference:

Chu, Z., Xu, J., Lai, F., & Collins, B. J. (2018). Institutional theory and environmental pressures: The moderating effect of market uncertainty on innovation and firm performance. *IEEE Transactions on Engineering Management*, *65*(3), 392-403.

Adebanjo, D., Teh, P. L., & Ahmed, P. K. (2016). The impact of external pressure and sustainable management practices on manufacturing performance and environmental outcomes. *International Journal of Operations & Production Management*.

Ahmed, W., Najmi, A., Arif, M., & Younus, M. (2019). Exploring firm performance by institutional pressures driven green supply chain management practices. *Smart and Sustainable Built Environment*.

Helmig, B., Spraul, K., & Ingenhoff, D. (2016). Under positive pressure: How stakeholder pressure affects corporate social responsibility implementation. *Business & Society*, *55*(2), 151-187.

Baah, C., Jin, Z., & Tang, L. (2020). Organizational and regulatory stakeholder pressures friends or foes to green logistics practices and financial performance: investigating corporate reputation as a missing link. *Journal of cleaner production*, *247*, 119125.

Ramanathan, R., He, Q., Black, A., Ghobadian, A., & Gallear, D. (2017). Environmental regulations, innovation and firm performance: A revisit of the Porter hypothesis. *Journal of Cleaner Production*, *155*, 79-92.

D'amato, A., & Roome, N. (2009). Leadership of organizational change toward an integrated model of leadership for corporate responsibility and sustainable development: A process model of corporate responsibility beyond management innovation (No. 2013/164611). ULB--Universite Libre de Bruxelles.

Chang, C. H. (2015). Proactive and reactive corporate social responsibility: antecedent and consequence. Management Decision.

Chou, P. (2014). Does Transformational Leadership matter during Organizational Change?. European Journal of Sustainable Development, 3(3), 49-49.

Manzoor, F., Wei, L., Nurunnabi, M., Subhan, Q. A., Shah, S. I. A., & Fallatah, S. (2019). The impact of transformational leadership on job performance and CSR as mediator in SMEs. Sustainability, 11(2), 436.

Rentizelas, A., de Sousa Jabbour, A. B. L., Al Balushi, A. D., & Tuni, A. (2020). Social sustainability in the oil and gas industry: institutional pressure and the management of sustainable supply chains. Annals of Operations Research, 290(1), 279-300.

Zhang, Y., Wei, Y., & Zhou, G. (2018). Promoting firms' energy-saving behavior: The role of institutional pressures, top management support and financial slack. Energy policy, 115,

230-238.

Yigitbasioglu, O. M. (2015). The role of institutional pressures and top management support in the intention to adopt cloud computing solutions. Journal of Enterprise Information Management.

Colwell, S. R., & Joshi, A. W. (2013). Corporate ecological responsiveness: Antecedent effects of institutional pressure and top management commitment and their impact on organizational performance. *Business Strategy and the Environment*, *22*(2), 73-91.

Weber, O. (2014). Environmental, social and governance reporting in China. *Business Strategy and the Environment*, *23*(5), 303-317.

Ouyang, Z., Cheng, P., Liu, Y., & Yang, R. (2020). Institutional drivers for corporate philanthropic activities in China: Mediating roles of top management participation. *Corporate Social Responsibility and Environmental Management*, *27*(1), 244-255.

Masud, M., Kaium, A., Rashid, M., Ur, H., Khan, T., Bae, S. M., & Kim, J. D. (2019). Organizational Strategy and Corporate Social Responsibility: The Mediating Effect of Triple Bottom Line. *International Journal of Environmental Research and Public Health*, *16*(22), 4559.

Charan, P., & Murty, L. S. (2018). Institutional pressure and the implementation of corporate environment practices: examining the mediating role of absorptive capacity. *Journal of Knowledge Management*.

Lin, L. H., & Ho, Y. L. (2016). Institutional pressures and environmental performance in the global automotive industry: the mediating role of organizational ambidexterity. *Long Range Planning*, *49*(6), 764-775.

37.

Corporate Big data-based Key Information Data Analysis for Competitor Search and its Applications to the Value Chain in Pharmaceutical Industry

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Abstract

Purpose/ Research Question:
This research seeks to answer the basic question like:

1. How can we develop a methodology that can easily analyze competitor information through the big data information of firms in starting a new business or identifying key companies in the industry?
2. What are the financial and non-financial indicators that can be fundamental to finding similar companies that can be competitive in a specific industry?
3. What is the methodology to address the limitations of connecting front or rear industries on the value chain map due to the relatively small amount of input and unstandardized item information and item transaction information?

Key Literature Reviews:

As competition increases for high-quality products, low costs and excellent customer service, businesses must continually assess the value they create. With government support, there are many R&D business startups in the biopharmaceutical industry based on the premise of commercialization.

In the current situation with countless technologies pouring out of the laboratories, excellence of technology is not enough to judge biotech companies (Woo, J et al., 2019). One of the most valuable tools, the value chain analysis, breaks down each process of a business and creates opportunities for innovation. Value chain analysis can help companies in various ways. It can create change within a business, the products and services it offers, and its connections with other businesses and their customers or clients. Analyzing a value chain has been regarded by experts as one of the most difficult tasks involved in technology planning. Kim et al. did the value chain mapping experiment that aimed to compare the results of expert-based and data-based mappings. Kim et al.'s case study results demonstrated that data-driven analysis can help researchers understand the status of industry structures, but experts' insights are still helpful for validating the analytic results in value chain mapping (Kim, K, 2018). Value chain management is the process of organizing all activities to properly analyze them. The goal is to establish communication between the leaders of each stage to ensure the product is placed in the customers' hands as seamlessly as possible (Kayla Harrison, 2019). A value chain is a model used by a company to identify its competitive position and find a point to improve it, to establish a competitive strategy.

Recognizing the importance of ensuring sustainable growth and competitiveness of small and medium-sized enterprises, the Korean government has continued to provide support to small and medium-sized enterprises, but the inefficiency of the support system has been raised in terms of effectiveness and efficiency. Due to limited resources of small and medium-sized enterprises, it is believed that technological development and capacity building through cooperation with the outside world are the basis for creating competitive advantages for companies. For example, small pharmaceutical biotech companies with good technology generally have limited R&D budgets and drug development periods are so long that they are often close to budgetary crisis (Lee, J.H et al., 2018). Firms are increasingly utilizing not only their own technologies, but also external knowledge and other technologies (Yun, J.-H et al., 2016). For cooperation with the outside world, it is necessary to analyze the relationship of business transactions from a series of value chains through the establishment of a knowledge ecosystem at the corporate level and to analyze the network of value chains that can visualize the results. It is exceedingly difficult to obtain information about competitors and potential candidates (Sung, Tae-Eung, et al., 2018).

Value chain is a useful tool for identifying customers or competitors, and it can be a good starting point for small and medium-sized enterprises to pursue new businesses if government support agencies can identify and suggest information on competitors and customers in certain industries using value chain. Value chain management (VCM) and supply chain management (SCM) are both related to the processes involved in getting goods from initial conception, purchasing all necessary raw materials and subassemblies and through all steps of manufacturing and ultimately, shipped, delivered or otherwise sold to consumers (Dave Kravitt, 2020). SCM(Supply Chain Management) is the integration of all the activities that relate to the flow and transformation of goods, including

associated information flows, from the raw materials stage right through to the end user in order to achieve a sustainable competitive advantage (S.W.F. Omta and S.J. Hoenen, 2012).

Competitor is defined as a company with market commonality and resource similarity, and in 1966 Chen presented "market commonality" and "resource similarity" as the most fundamental concepts in the analysis of competition relationships (Chen, 1996). Firms today face constant pressure to maintain sustainable growth, stay ahead of their competitors, and present superior customer-centric products. It is impossible for any firm to adequately survive, without developing a thorough market perspective. The pharmaceutical industry, where research and development (R&D) efficiency is central to company survival, has recently faced significant challenges (Shin, K et al., 2028). The market factor was the most influential consideration when determining the technology fee (Lee, J.H et al., 2018). One of the tools for gaining the market insight is by developing the right competitive intelligence that can have a far-reaching strategic impact on a firm's operations strategy and business process management. The first task of competitor analysis is to identify rivals that offer similar products/services and compete head-on in the marketplace (Guo, Liang, et al., 2017). More costs and efforts are required to identify additional unknown competitors (D. B. Montgomery, 2005) and well-designed CI is needed to improve firms' performance by taking account of more competitors (B. H. Clark, 1996). Competitor identification (CI) is critical for a firm's decision making and its subsequent actions, so it has been the focus of diverse management and marketing studies (J. Wu and P. Olk, 2014).

Transaction information plays an important role in providing information regarding potential customers. Transaction information of items between companies is necessary in order to analyze inter-company deal relationships from a series of value chains results (Sung, Tae-Eung, et al., 2018), but information regarding inter-company deal and items enrolled on Corporate Credit Information database is very limited. Finding appropriate indicators for identifying customers or competitors based on data such as corporate characteristics and analysis indicators is an important first step for SMEs to identify customers and competitors to strengthen cooperation and competitiveness with the outside world.

A transaction network is a network formed by interfirm transactions such that the firms and their transactions correspond to the nodes and edges, respectively, of the network. A transaction network can illustrate not only complex interfirm relationships in terms of the firms' actual economic activities but also resource shifts and the market engagement of firms. As plenty of information exists in a transaction network, transaction networks have been employed by and applied to diverse analyses and studies such as the permeable structural properties of supply chains, and so on (J. Luo, C. Y. Baldwin et al., 2012). Choi et al. proposed a novel method based on two dimensions of pairs of firms, resource similarity and market commonality for the identification of firm-level competitors using a network constructed from financial transactions among firms (J. Choi, 2019).

The Nice Classification (NCL), established by the Nice Agreement (1957), is an international

classification of goods and services applied for the registration of marks. Item information, which is the key to inter-company transaction information on the Value Chain Network System (VCNS), is not standardized and is often missed even though it is the same item. So, the application of Nice Classification (NCL) for item information entered on VCNS can be systematic and standardized.
Cummings et al. suggested the economic index, the political index, and the technical index to identify the competitors (Cummings, Jeffrey L., 2000). With the rapid development of internationalization, intellectual property competition becomes one of enterprise competition patterns internationally. So patent is one of important index to identify the competition (Xiang Yu et al, 2019). Based on these existing findings, it is deemed necessary to review financial and non-financial(patent) indicators as analysis indicators that identify competitors based on data on corporate big data.

Design/ Methodology/ Approach:

In this study, we review financial and non-financial indicators as analysis indicators that identify competitors based on data on corporate big data. And then examines existing indicators that can be used based on data for finding competitors and finding core companies.
Matching the product list of Nice Classification (NCL) with the name of the item on the sub-class of the front, main and rear industries on the value chain of the industry, creates a matching table to increase the number of companies linked to the value chain. Among the existing indicators, only qualitative indicators are excluded, quantitative indicators are selected, only indicators that can be calculated by the existence of formulas are selected, and indicators that are actually linked to the data are selected and classified as patent and non-patented again.
We match the product list of Nice Classification (NCL) with the name of the item on the sub-class of the front, main and rear industries on the value chain of pharmaceutical industry first to perform the case study to apply such indicators on the value chain of pharmaceutical Industry. Companies connected to the matching table can be said to be among the primary candidates for competitors and can identify competitors on a data basis by comparing or sorting similar entities by comparing figures in ex with the following steps.

(Expected) Findings/Results:
We will suggest financial and non-financial (patent) quantitative indicators to identify potential competitor or key player in specific industry after reviewing the existing available indicators.
We will suggest the methodology to match the product list of Nice Classification (NCL) with the name of the item on the sub-class of the front, main and rear industries on the value chain of specific industry.
We will demonstrate the case study for the value chain of pharmaceutical industry to find potential

competitors based on our proposed data-driven methodology on Value Chain Network System (VCNS) by using the application of Nice Classification (NCL) on the name of the item of the value chain and financial and non-financial (patent) quantitative indicators.

Research limitations/ Implications:

There exist a couple of limitations for the methodology considered herein. First, because only one industry was selected for case study, there may be other problems that are not expected in other industries. Second, the process of matching the product list of Nice Classification (NCL) with the name of the item on the value chain is the kind of text-mapping process. Because it is a kind of text-mapping, it has the limitations of text-mapping methodology.

Keywords: Value Chain, Value Chain Network System (VCNS), corporate big data, competing company, Transaction information, Nice Classification, financial indicator, non-financial (patent) indicator, data mining

References:

1. Kayla Harrison, What Is Value Chain Analysis?, businessnewsdaily.com, Aug 29, 2019.
2. S.W.F. Omta and S.J. Hoenen, Fundamental perspectives on supply chain management, Journal on Chain and Network Science 2012; 12(3): 199-214.
3. Dave Kravitt, What Are The Differences Between Value Chain Management and Supply Chain Management?, Blog, October 23, 2020: https://www.precisionsg.com/erp-blog/differences-between-value-chain-management-and-supply-chain-management (accessed on 3 November 2020).
4. Chen, M. J. 1996. "Competitor Analysis and Inter-firm Rivalry: Toward a Theoretical Integration," Academy of Management Review, 21: 100-134.
5. Guo, Liang, et al. "Automated competitor analysis using big data analytics." Business Process Management Journal (2017).
6. D. B. Montgomery, M. C. Moore, and J. E. Urbany, "Reasoning about competitive reactions: Evidence from executives," Market. Sci., vol. 24, no. 1, pp. 138–149, 2005.
7. B. H. Clark and D. B. Montgomery, "Perceiving competitive reactions: The value of accuracy (and paranoia)," Market. Lett., vol. 7, no. 2, pp. 115–129, 1996.
8. Sung, Tae-Eung, et al. "A Study on Intelligent Value Chain Network System based on Firms' Information." Journal of Intelligence and Information Systems 24.3 (2018): 67-88.
9. J. Wu and P. Olk, "Technological advantage, alliances with customers, local knowledge and

competitor identification," J. Bus. Res., vol. 67, no. 10, pp. 2106–2114, 2014.

10. J. Luo, C. Y. Baldwin, D. E. Whitney, and C. L. Magee, "The architecture of transaction networks: A comparative analysis of hierarchy in two sectors," Ind. Corporate Change, vol. 21, no. 6, pp. 1307–1335, 2012.
11. J. Choi, A. Tosyali, B. Kim, H. Lee and M. K. Jeong, "A Novel Method for Identifying Competitors Using a Financial Transaction Network," in *IEEE Transactions on Engineering Management*, doi: 10.1109/TEM.2019.2931660.
12. Kim, K.; Lee, S. How Can Big Data Complement Expert Analysis? A Value Chain Case Study. Sustainability 2018, 10, 709.
13. Cummings, Jeffrey L., and Jonathan P. Doh. "Identifying who matters: mapping key players in multiple environments." California Management Review 42.2 (2000): 83-104.
14. Xiang Yu et al., Obtaining advantages from technology revolution: A patent roadmap for competition analysis and strategy planning, Technological Forecasting & Social Change 145 (2019) 273–283.
15. Lee, J.H.; Kim, E.; Sung, T.-E.; Shin, K. Factors Affecting Pricing in Patent Licensing Contracts in the Biopharmaceutical Industry, J. Open Innov. Technol. Mark. Complex. 2018, 1, 3143.
16. Yun, J.-H. J.; Won, D.; Park, K. Dynamics from open innovation to evolutionary change, J. Open Innov. Technol. Mark. Complex, 2016, 2, 7.
17. Lee, J.H.; Sung, T.-E.; Kim, E.; Shin, K. Evaluating determinant priority of license fee in biotech industry. J. Open Innov. Technol. Mark. Complex. 2018, 4, 30.
18. Woo, J.; Kim, E.; Sung, T.-E.; Lee, J.; Shin, K. Developing an Improved Risk-Adjusted Net Present Value Technology Valuation Model for the Biopharmaceutical Industry, J. Open Innov. Technol. Mark. Complex. 2019, 5, 45.
19. Shin, K.; Lee, D.; Shin, K.; Kim, E. Measuring the Efficiency of U.S. Pharmaceutical Companies Based on Open Innovation Types, J. Open Innov. Technol. Mark. Complex. 2018, 4, 34.

38.

Designing Entrepreneurial Business Process and Organization for Dynamic Startups Inter-Organizational Business Process Collaboration

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Keywords: Outsourcing, Startups Inter-Organizational Collaboration, Entrepreneurial Business Process Collaboration Model, Business Process, Organizational Structure, Stakeholder

Purpose/ Research Question

The degree to which a startup thinks that there is a good opportunity to start a new business [1], or the degree to which the entrepreneurs are highly evaluated is defined as "startup attitude" by GEM (Global Entrepreneurship Monitor). It is analyzed that entrepreneurial attitude can be influenced by two dimensions: Entrepreneurial activity and Social Network activity. In this study, the relationship between external stakeholders and partners as well as resources as a necessary factor for startup operation is considered as an important factor [2]. Startups can cause a lot of confusion in work due to the inability of business management to be specified in a state in which internal process establishment is insufficient [3], and eventually, such confusion results in a failure of startup. Globally, outsourcing has become a strategic tool to increase the sustainability and efficiency of startups and SMEs in a rapidly changing environment. However, Korea is focusing only on outsourcing to secure inexpensive manpower, so companies are bound to lag behind in terms of competitiveness and internationalization. In particular, companies are also integrating business

processes and resources (manpower, etc.) and actively collaborating to adapt to changes, expand performance and improve cost efficiency. However, since most of the existing organizations only performed collaboration between departments within the organization, the system installed inside each company reveals many limitations in performing collaboration with external stakeholders. In order to solve the scarce resources within the organization and increase the organization's performance and competitiveness, such as new business development, many companies need to expand collaboration with external stakeholders in various ways. In the context of expanding outsourcing for the development of new businesses, etc., it is a very important matter to accurately identify the elements and effects necessary for collaboration between companies, and to quickly establish a work performance system that reflects them, but related research is absent. This study aims to study "Designing Entrepreneurial Business Process and Organization for Dynamic Startups Inter-Organizational Business Process Collaboration" which overcomes the limitations of existing entrepreneurial process research.

Key Literature Reviews (About 3~5 papers)

External cooperation also significantly affects start-ups' management performances. Start-up companies find it difficult to survive the competition with established companies because of insufficient resources, weak rationality, lack of legitimacy, and the absence of an external stakeholder network [4]. On the other hand, relationships with partners with complementary abilities and resources positively affect the development of start-ups [5–7].

Founders of start-ups are interested in learning how to utilize resources necessary for company management [8]. They problem-solve as long as they are aware of where the required resources or stakeholders for start-ups are available but struggle with the "what" and "how" in this context. While know-how plays a key role in start-ups, resource management is also an important factor from the know-who and know-where viewpoints. To maximize performance, it is important to establish an appropriate combination of the three factors directly impacting start-up performances (i.e., teams, resources, and opportunities) and this can be achieved through the systematic management of business processes [9].

Studies have presented modeling methodologies for entrepreneurial business processes to efficiently explore resources and stakeholders necessary for start-up management from the perspectives of know-why, know-what, know-who, and know-how. To lower the probability of failure in the initial stage of a start-up, systematic management and support is necessary for resource

acquisition and allocation, which can be achieved through business process management [10]

In the era of the 4th industrial revolution, many SMEs and startups collaborate in their own way and search for organizations with the same business goals for value innovation centered on collaboration. Most of today's products and services are the result of the collaboration of numerous companies forming a value chain commonly known as supply chain [11]. Many organizations within these value chains have their own corporate objectives and coordinate decision making to achieve common goals and optimal performance. Collaboration is generally expressed in various forms, such as joint ventures, R&D cooperation, strategic cooperation agreements, and license agreements, but it can be summarized as 'an agreement in which several organizations with common goals participate'[12].

However, despite the fact that many current companies, such as outsourcing or new business development, are planning or conducting collaboration in a rapidly changing environment, the Collaborative Business Process (CBP), which can fundamentally support this, is concerned with the relationship between factors that affect the outcome of collaboration. Since it is being operated vaguely without clearly defined and clarified, it has not been able to induce substantial organizational innovation. In addition, the overall performance is not improved because the organization is not defined and approached in terms of collaboration with external stakeholders. To solve this problem, many existing studies point out that elements related to collaboration, including business processes and organizational structures, must be analyzed and improved in order to improve practical performance through collaboration. Therefore, in this study, focusing on the entrepreneurial business process and organizational structure from the perspective of startups, the BPC (Business Process Collaboration) Model is an extension of the Collaborative Business Process, which was studied focusing on collaboration between organizations under the established partnership.

In major related studies, it was mentioned that the lack of understanding of the corporate collaboration (organizational) structure and the key elements in collaboration is regarded as the main cause of collaboration failure [13]. Then, it is important for the stakeholders who want to participate in the collaboration relationship to understand and participate in the complexity of collaboration, the structuring method, and the interaction method, which are the main factors that affect collaboration [14]. Object Management Group (OMG) established standards for organizational and business process models, but failed. This research team has developed an entrepreneurial business process model (Entrepreneur Business Process Notation (EBP-N)) with expressive power that can define requirements for internal/external collaboration for early companies with high

dependence on external factors. . BPC Model development that can define the requirements for business process collaboration between companies required for this study is possible by extending EBP-N. The model proposed in this study is expected to be of sufficient value to be used by standard organizations such as OMG. In addition, it is difficult to know how it is appropriate for the current startup companies to transform their processes and organizational structures in order to efficiently collaborate with external stakeholders based on the methodology alone. In order to go beyond the theoretical methodology for collaboration and to be of practical help to the company, we researched a methodology that allows us to explore which processes and organizational structures are better to design according to the current organization's situation (which organization collaborates with). Present the results of the study.

Design/ Methodology/ Approach

In this study, a model that enables start-up companies to cooperate with external stakeholders through outsourcing to determine whether they have the resources and expertise necessary for equipment and facilities, as well as resources necessary for collaboration, and an efficient work performance system from this quickly We intend to derive a design methodology that can be constructed. To this end, I would like to propose a study to solve the following problems. First, the existing business process operation and management methods do not effectively support collaboration with various internal and external stakeholders considering the characteristics of startups. Business process refers to "the flow of work required to achieve a single goal" and is managed through a single system within the company. In particular, when collaborating, the business processes managed inside each company must be managed by both companies at the same time. Various issues exist in the process as follows.

- What form or characteristics should a startup company performing collaboration have?
- What are the different ways of managing and storing process data between the various stakeholder companies that collaborate, and what perspectives or factors should be considered in this area?
- What tasks in the current process need to be improved through collaboration with external stakeholders (corporate unit, organizational unit, etc.)?

Second, it is difficult to integrate the organizational structure (operating entity or execution

system) that operates the business process. Organizational structure refers to the organizational system of workforces to achieve the purpose of a company. It is the organizational structure of each company to carry out a given business process, and research on how the organizational structure should be integrated in order to best perform the process is currently insufficient. Various issues exist in the process as follows.

- Is the organizational structure of the startups you want to collaborate with to carry out the current process?
- Are the number of resources and capabilities of the startups you are trying to collaborate with suitable to carry out the current process?

Nevertheless, in recent years, many proposals dealing with business processes and collaboration modeling have been mostly made from the perspective of intra-organizational collaboration, failing to consider collaboration with external stakeholders. Most of the collaborative business process research currently being developed is also vaguely progressing without clearly defining and identifying factors that affect collaboration with external organizations, which can change at any time. It does not provide a practical solution to the organization. Then, in order to improve the performance of collaboration between organizations, what elements of the organization should be considered, and how should the organizational structure and process for collaboration be designed? In order to answer this question, this study conducts a study to explore how to optimize each organizational structure and process when existing start-up enterprise organizations collaborate with internal/external stakeholders (organizations).

(Expected) Findings/Results

The research topics covered in this study are fields that require fusion and joint research efforts in various fields such as industrial engineering/management science, business administration (start-up and entrepreneurship related research), simulation, and data mining. In particular, the study of business process management from a startup perspective is a representative and most integrated Real-World Problem. Therefore, in this study, from the integrated perspective of industrial engineering/management science/business administration/simulation/data mining, we will quantitatively and systematically diagnose startups and support them to efficiently derive information necessary for major business operations. In addition, it is expected that the output of

the research can suggest the direction of domestic and international business process and entrepreneurship/foundation research and lead creative changes by providing a methodology that researchers in related fields can refer to from various perspectives in the future.

Reference

[1] Global Entrepreneurship Monitor(GEM) Korea Report (2012)

[2] Yoon, J., & Sung, S. (2019). The effects of entrepreneurial business process on new firm creation. *Knowledge Management Research & Practice*, 17(2), 182-191.

[3] Bernaert, M., Poels, G., Snoeck, M., & De Backer, M. (2014). Enterprise architecture for small and medium-sized enterprises: a starting point for bringing EA to SMEs, based on adoption models. *In Information Systems for Small and Medium-Sized Enterprises (pp. 67-96)*. Springer Berlin Heidelberg.

[4] Dahl, S. Å., & Nesheim, T. (1998). Downsizing strategies and institutional environments. *Scandinavian Journal of Management*, 14(3), 239-257.

[5] Gulati, R., & Gargiulo, M. (1999). Where do interorganizational networks come from?. *American journal of sociology*, 104(5), 1439-1493.

[6] Park, J. H., Lee, B., Moon, Y. H., & Kwon, L. N. (2016). Study for selection of industrial areas suitable to small and medium-sized enterprises (SMEs) in Korea. *Journal of Open Innovation: Technology, Market, and Complexity*, 2(3), 19.

[7] van Schijndel, L. (2019). TCKF-Connect: A Cross-Disciplinary Conceptual Framework to Investigate Internationalization within the Context of Entrepreneurial Ecosystems. *Journal of Open Innovation: Technology, Market, and Complexity*, 5(2), 28.

[8] Dubickis, M., & Gaile-Sarkane, E. (2017). Transfer of know-how based on learning outcomes for development of open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, 3(1), 4.

[9] Kim, J. H., & Jung, S. H. (2015). Study on CEO characteristics for management of public art performance centers. *Journal of Open Innovation: Technology, Market, and Complexity*, 1(1), 5.

[10] Gupta, A., Dey, A., & Singh, G. (2017). Connecting corporations and communities: Towards a

theory of social inclusive open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, 3(3), 17.

[11] Barcelona, M. A., García-Borgoñón, L., Escalona, M. J., & Ramos, I. (2018). CBG-Framework: A bottom-up model-based approach for Collaborative Business Process Management. *Computers in Industry*, 102, 1-13.

[12] Chen, X. L., Mahling, A., Riedel, R., & Müller, E. (2015, December). Organizational structure and the dynamics of collaboration relationship. *In 2015 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM) (pp. 460-464)*. IEEE.

[13] Busi, M., & Bititci, U. S. (2006). Collaborative performance management: present gaps and future research. *International journal of productivity and performance management*.

[14] Verdecho, M. J., Alfaro-Saiz, J. J., & Rodríguez-Rodríguez, R. (2011, October). A Review of factors influencing collaborative relationships. *In Working Conference on Virtual Enterprises (pp. 535-542)*. Springer, Berlin, Heidelberg.

39.

The Effect of Learning Orientation and Business Model Innovation on Entrepreneurial Performance : Focused on South Korean Start-up Companies

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Abstract

Purpose/Research Question: South Korea is undergoing rapid pursuit of new developing countries (China, India, Vietnam, etc.) (Lee, 2020). In order to differentiate from new developing countries, Korea is required to shift its industrial paradigm from its role as a production base of advanced countries based on relatively low wages and imitation technology to an advanced start-up economy (Lee, 2020). In other words, based on new ideas and technologies, the development of innovative products and services that can compete with developed countries was forced to shift to an entrepreneurial economy, which is an important element of competitiveness. The success or failure of a start-up economy depends on the emissions of competitive founders who can create new value. A start-up not only creates new companies through innovation, but also brings about industrial and economic development, develops the human resources needed for new industries and markets, and helps to develop industry and national competitiveness (Terjesen and Wang. , 2013).

Learning orientation and business model Innovation contribute to improving a company's

competitiveness and outcomes with systems and cultures that acquire, share and disseminate market and environmental knowledge and information (Baker and Sinkula, 1999; Calantone et al., 2002; Baker and Sinkula, 2009). Innovation is a learning-based process that is a fundamental prerequisite for a start-up economy, and organizational learning plays an important role in defining innovation (Tang, 2006; Aragon-Correa, 2007). Organizational learning enhances quality, strengthens customer relationships, and provides sustainable profitability through improved business strategies (Mills and Freisen, 1992). Sustainable profitability is achieved through learning and business model innovation through historical data and experience. Avalos and Hernández (2019) argued that iterative learning through innovation is important because the use of new knowledge is difficult with traditional methods. For this reason, companies should improve their business models and form an innovation-related process base through iterative learning in order to achieve management performance. Much research has been done on learning orientation, innovativeness and business performance (Calantone et al., 2002; Panayides and so 2005; Aragon et al., 2007; Setini et al., 2020; Lee et al. , 2019), the empirical research on learning orientation, innovativeness, and entrepreneurial performance for start-up companies is still very lacking.

Key Literature Reviews (About 3~5 papers): Calantone et al (2002) found in 187 R&D companies in the USA that learning orientation influences innovation. Learning orientation and innovation affect performance, and age of the organization reveals a regulatory effect between learning orientation and innovation. Panayides and so (2005) found a positive correlation between organizational learning and innovation in a study of 251 logistics companies in Hong Kong, and found that innovation affects outcomes. Aragon et al (2007) found in a study of 408 large companies in Spain that organizational learning and innovation affect performance, and that organizational learning influences innovation. Setini et al. (2020) revealed that knowledge sharing affects innovation for 200 female entrepreneurs in Indonesia, and knowledge sharing and innovation affect outcomes. Lee et

al. (2019) is a study of 171 Korean students who participate in the entrepreneurship club. The results showed that start-up intention affects innovative behavior and entrepreneurship(innovation, risk taking, proactiveness). It was revealed that it partially mediates the analysis results of the effects of the entrepreneurship(innovation, risk taking, proactiveness) parameters of between startup intention and innovative behavior.

Design/Methodology/Approach: If the hypothesis setting of the main variables and the quest ionnaire question are selected through the previous research, a questionnaire survey will be c onducted for the start-up companies to empirically analyze this.

The survey procedure goes through the following five steps.

Stage 1: Finding variables and measurement items through analysis of existing literature

Stage 2: Research model and hypothesis setting

Stage 3: Questionnaire survey of start-up companies

Stage 4: Evaluation index tableting

(Improved validity for item comprehensive correlation / reliability analysis and factor analysis)

Stage 5: Hypothesis verification (path analysis, verification of parameter effect by bootstrap method)

SPSS and AMOS programs will be used to analyze the results of the questionnaire survey. At the very beginning, we plan to analyze the individual items of the survey question and the Pearson correlation (item-comprehensive correlation) between the total points. We will try exploratory and confirmatory factor analysis to verify the composition validity. In order to verify the goodness of fit by exploratory factor analysis, we will verify the numerical value of Kaiser-Mayer-Olkin (KMO) and

the old formation verification of Bartlett. Exploratory factor analysis uses the varimax method of principal component analysis to determine components when Eigen is 1 or greater and factor loading is 0.5 or greater. We will also check the value of Cronbach alpha (0.6 and above) to measure the question-internal consistency of the confirmed components. A structural equation model is estimated for confirmatory factor analysis, and the goodness of fit of the conceptual configuration is compared and analyzed assuming two alternative models. Considering the ratio of the χ2 value to the degrees of freedom, Comparative Fit Index (CFI), Uurcker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA) indices, the model will be judged as suitable if the fit of the basic model is the highest. When the goodness of fit is found through comparative analysis between models, the reliability of the concept and the variance extraction index value are confirmed. In all factors, if the conceptual reliability is greater than the reference value of .7, the variance extraction index is greater than the reference value of .5, and the correlation between each factor is found to be higher than the squared value, the reliability of the sub-factors is determined to be appropriate. Hypothesis testing is performed through path analysis and verification of mediation effects by the bootstrap method.

<Operational definition of variables>

variable	Variable definition	Prior research
Learning Orientation	Activities that actively encourage learning and strive to create new knowledge to cultivate the ability of members of the organization to strengthen the competitiveness of start-up companies	Slater and Narver(1995), Calatone et al.(2002)
Business Model Innovation	Activities to encourage creative ideas for the development of new projects, new products or new services	Hult et al (2004) Hurley et al(1998)

entrepreneurial performance	Technology acquisition and market expansion performance in the startup process	Gartner(1985) Venkataraman (2019)

(Expected) Findings/Results: In order to achieve this goal, this study aims to address the following problems.

1. The effect of innovation on the learning orientation of the start-up company
2. The effect of entrepreneurial performance on the innovation of the start-up company
3. The effect of entrepreneurial performance on the learning orientation of the start-up company
4. Mediating effect of innovation on learning orientation and entrepreneurship of the start-up company

Research limitations/Implications:

In this research, we analyze the influence of learning orientation and innovation on entrepreneurial achievements and the influence of learning orientation on entrepreneurial achievements through a questionnaire survey of start-up companies for less than 7 years. It plans to analyze the mediating effects of the relationship between entrepreneurship and entrepreneurship.

The importance of the start-up economy is emerging not only in South Korea but also in the world as there is a limit to the existing economic growth centered on large corporations. This study is meaningful in conducting an empirical study on the effect of entrepreneurship performance for start-ups based on previous studies of learning orientation, innovation, and performance conducted for large companies and SMEs.

Through the analysis of the factors that affect the performance of start-ups and the practice of those factors, it will be possible to cultivate the capacity to continuously grow in the market, which will be used as a strong survival strategy in the current market where dynamic changes are

constantly being made.

Keywords: Learning Orientation, Business Model Innovation, Entrepreneurial performance, Start-up Companies

References

[1] Aragon-Correa, J.A., Garcia-Morales, V.J. and Cordon-Pozo, E., 2007, 'Leadership and Organizational Learning's Role on Innovation and Performance: Lessons from Spain', *Industrial Marketing Management*, 36, 3, pp. 349-359

[2] Avalos-Quispe, G. A., & Hernández-Simón, L. M. (2019). Open innovation in SMEs: Potential and realized absorptive capacity for Interorganizational learning in dyad collaborations with academia. *Journal of Open Innovation: Technology, Market, and Complexity*, *5*(3), 72.

[3] Baker, W. E. and J. M. Sinkula(1999). The synergistic effect of market orientation and learning orientation on organization performance. *Journal of the Academy of Marketing Science*, 27(4): 411 - 427., https://doi.org/10.1177/0092070399274002

[4] Baker, W. E. and J. M. Sinkula(2009). The complementary effects of market orientation and entrepreneurial orientation on profitability in small businesses. *Journal of Small Business Management*, 47(4): 443 - 464., https://doi.org/10.1111/j.1540-627X.2009.00278.x₩

[5] Calantone, R. J., S. T. Cavusgil, and Y. Zhao(2002). Learning orientation, firm innovation capability, and firm performance. *Industrial Marketing Management*, 31: 515 - 524., https://doi.org/10.1016/s0019-8501(01)00203-

[6] Gartner, W. B., & Vesper, K. H. (1994). Experiments in entrepreneurship education: Successes and failures. *Journal of Business Venturing*, *9*(3), 179-187.

[7] Hult, G. T. M., Hurley, R. F., & Knight, G. A. (2004). Innovativeness: Its antecedents and impact on

business performance. *Industrial Marketing Management*, *33*(5), 429-438.

[8] Hurley, R. F., & Hult, G. T. M. (1998). Innovation, market orientation, and organizational learning: an integration and empirical examination. *Journal of Marketing*, *62*(3), 42-54.

[9] Lee, J. H (2020). 'A Study on the Impacts of Market Orientation and Learning Orientation on Entrepreneurial Performance of Entrepreneurs', *Korean Business Education Review* 35(1), 2020.2, 357-374.

[10] Lee, J., Kim, D., & Sung, S. (2019). The Effect of Entrepreneurship on Start-Up Open Innovation: Innovative Behavior of University Students. *Journal of Open Innovation: Technology, Market, and Complexity*, *5*(4), 103.

[11] Mills, D.O. and Freisen, B., 1992, 'The Learning Organization', *European Management Journal*, 10, 2, pp. 146-156.

[12] Panayides, P.M. and So, M., 2005, 'Logistics Service Provider-Client Relationship', *Transportation Research,* Part E, 41, 3, pp. 179-200.

[13] Setini, M., Yasa, N. N. K., Gede Supartha, I. W., Ketut Giantari, I., & Rajiani, I. (2020). The Passway of Women Entrepreneurship: Starting from Social Capital with Open Innovation, through to Knowledge Sharing and Innovative Performance. *Journal of Open Innovation: Technology, Market, and Complexity*, *6*(2), 25.

[14] Slater, S. F., & Narver, J. C. (1995). Market orientation and the learning organization. *Journal of Marketing*, *59*(3), 63-74.

[15] Tang, J., 2006, 'Competition and Innovation Behavior', *Research Policy*, 35, pp. 68-82.

[16] Terjesen, S. and N. Wang(2013). Coase on entrepreneurship. *Small Business Economics*, 40: 173 - 184., https://doi.org/10.1007/s11187-012-9468-2

[17] Venkataraman, S. (2019). The distinctive domain of entrepreneurship research. In *Seminal ideas for the next twenty-five years of advances. Emerald Publishing Limited*.

[18] Wang, C. L.(2008). Entrepreneurial orientation, learning orientation, and firm performance. *Entrepreneurship Theory and Practice*, 32(4): 635 - 657., https://doi.org/10.1111/j.1540-6520.2008.00246.x

40.

The Effect of open innovation capability on management performance: Comparative analysis of Venture, Medium, and Large Companies in Korea

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Abstract

Purpose/ Research Question:
Recently, the Korean economy has been facing difficulties in industries with high economic ripple effects and a sense of crisis has consequently been spreading throughout the manufacturing sector. According to the December 2019 Annual Industrial Activity Trends Report released by Statistics Korea, the average operating rate in the domestic manufacturing sector fell 0.7% to 71.9% year-over-year, the lowest since 1998 when it was 67.6% due to the International Monetary Fund financial crisis that was in full swing [1]. As a result, the government has been promoting the development of venture enterprises as a strategy to overcome the domestic industry crisis and advance existing industries. Venture enterprises include venture capital investment enterprises, technology-intensive new start-ups, and new technology-based start-ups.
A venture enterprise refers to an independent enterprise that is highly technical and adventurous and has a frontier spirit. More specifically, it is a new type of enterprise that varies from conventional enterprises with the scope of business determined on a quantitative basis, such as the number of employees, total assets, capital, sales, or on a qualitative basis, such as the life cycle of a product and motive for business management. Therefore, venture enterprises are considered to be leaders in product innovation during the early stages of specific industries as they attempt revolutionary technological innovation, rather than simple improvements or imitations, while contributing more to major technological changes.
This study seeks to examine the impact of R&D activities on business performance. In particular, it aims to confirm that R&D activities can have different effects on business performance by the different type of companies, venture companies, medium companies, and large companies using theoretical consideration and empirical analysis. R&D is considered a key activity of a company and is an important input of performance. For firms to achieve a long-term competitive advantage, they need to vitalize continuous R&D activities for the sustainability. In recent years, many researchers have conducted studies to identify the characteristics of firms that enhance business performance. This research has focused on empirical analysis of specific R&D activities, such as internal resource

utilization and external cooperation of R&D. However, to identify business performance, it is necessary to not only increase R&D activity, but also to analyze the organizational change that are connected to business performance, as well as the basic capabilities related to R&D activities of firms.

[Research Question]

H1. Internal R&D activities will have a significant effect on business performance of companies positively.

H2. External R&D activities will have a significant effect on business performance of companies positively.

H3. The effect of R&D activities on business performance will be different by the type of the companies, ventures companies, medium companies, and large corporation.

Key Literature Reviews

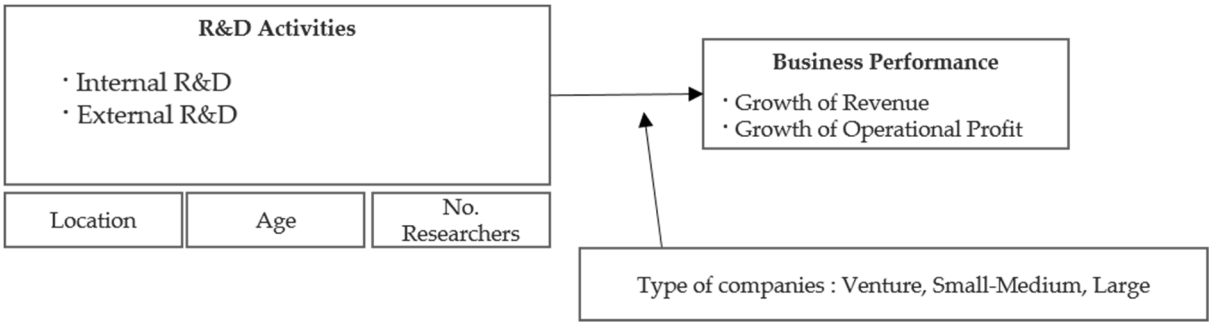
R&D activities can be largely classified by internal and external activities. Internal R&D activities means the resources of the firm are established to develop R&D internally. This can be evaluated in terms of R&D intensity, human resources, etc. It has been found that direct investment, such as R&D spending on sales and the number of R&D workers among total employees, has a positive impact on business performance. However, it is not possible for a company to perform all of the theoretical and technical demands required for innovation with its own internal capabilities, and external partners must be identified and specifically accessed to allow innovation. Thus, external R&D capability can be defined as the formalized structure of linkage with the external environment for undertaking R&D, such as human and material networks for research and development, strategic alliances, etc.

R&D activities are conducted through a series of activities that affect enterprise innovation performance. Internal and external R&D serve as an enterprise's innovation index, promoting the increase in activities. Despite the recent increase in strategic partnerships centered around R&D outsourcing and R&D, internal R&D appears to have a defining relationship with product innovation that "introduces a market for new products or services or functionally significantly improved products or services". In addition, the acquisition of devices, equipment, and software has a positive impact on developing new innovative processes. Process innovation can be improved gradually through new equipment and equipment suppliers. In fact, enterprises prefer R&D collaborations with others or the introduction of new technologies and equipment from external sources rather than developing their own process innovation. Supporters of this innovation system approach argue that enterprises drive innovation through continuous interaction with other enterprises and

organizations, not through isolation. Thus, enterprises often rely on external technologies through partnerships with other enterprises rather than through existing arm's-length markets. Interactions between enterprises and suppliers, customers, public research institutes, industry associations, and foundations can also provide external inputs that cannot be easily developed by the enterprises themselves. The purpose of these interactions is to supplement the internal learning process by acquiring information on technology, markets, or other resources. Moreover, R&D collaboration between enterprises can boost innovation activities by creating synergy between internally owned knowledge (technology) and externally owned knowledge (technology). Particularly, enterprises in the high-tech industry tend to undertake innovation activities through R&D collaboration, as technology advances very quickly compared to other industries.

Design/ Methodology/ Approach:

In this study, the impact of R&D activities on the enterprise management performance of South Korean companies, venture companies, medium companies, and large companies, comparatively. The data was used from the Technological Innovation Survey which is intended to identify the current status and characteristics of Korean enterprises' overall innovation activities and to establish basic data necessary for national innovation policy-making and innovation research. Based on the internationally recognized OECD's Oslo Manual, the survey provides reliable statistics on innovation that can be compared internationally. The analysis targets 7,000 companies, 303 large companies, 3,616 medium companies, 3,081 from the Korean Enterprise Innovation Survey for their R&D activities and business performance from 2015~2017.



Research Framework

(Expected) Findings/Results:

The analysis results in this study can be summarized as follows: First, the analysis results of R&D innovation activities and business management performance showed that internal and external R&D all affected revenue and operating profit, corresponding to the management performance of three types of companies. The analyses were conducted on venture companies, small- and medium

companies, and large corporations that undertook R&D innovation activities and showed that R&D innovation activities had a positive effect on patents created for both business entities. This implies that such activities have a positive role in management activities. Thus, SMV and large cooperation should consider R&D innovation activities from a business growth strategy perspective. However, each R&D activity has the different effect on the patent created for the venture companies and large corporation. While external R&D and cooperation R&D of venture companies have a positive effect on the patent performance, internal R&D does not have a positive effect on the performance of patent creation. For large corporation, cooperation R&D and internal R&D have a positive effect on the patent creation, External R&D does not. This is consistent with numerous previous studies that found R&D innovation activities to be the most common method to acquire new knowledge or technology. Therefore, enterprises can expect to improve management performance and develop a competitive edge through internal R&D and external R&D with other enterprises or organizations in various fields. Moreover, the intent of R&D innovation is to introduce and apply new technologies or operating systems to organizations in order to respond flexibly to a rapidly changing environment. Therefore, enterprises can strengthen their collaborative structure with external organizations and improve their working relationship through R&D innovation, which will also contribute positively to efforts to enhance their competitiveness, including financial performance. This study validated that external R&D activities could positively affect business management performance by creating synergy between internally owned knowledge (technology) and externally owned knowledge (technology), as reported in previous studies. In particular, in the high-tech venture industry that integrates new technologies, the development of technology occurs at a much faster rate compared to other industries, and enterprises actively collaborate on internal and external R&D activities to meet various goals. It was confirmed that the more venture enterprises participated in R&D activities, the better their performance would be, as concluded in previous studies. As discussed in these various studies, R&D activities are considered to be key strategies for venture enterprises to grow and survive.

Research limitations/ Implications:

The limitations of this study are as follows. First, business management performance was analyzed in this study only with respect to R&D innovation activities. In the future, it is necessary to understand the relationship between business management performance and various other enterprise innovation activities. Second, only South Korean enterprises were subject to the analysis in this study. Comparative analysis should be conducted using the data from this study as well as those from other countries. Moreover, this study is significant in that the relationship between the different types of R&D innovation activities (internal R&D, external R&D) and business performance was demonstrated, and the moderating effect of expertise's capacity to hold patents capacity was empirically analyzed, which could serve as the basis for additional research in the future. In addition,

we hope that the results of this study will contribute to the seamless implementation of various innovation activities of small- and medium-sized venture enterprises in the future. Today, innovation is achieved by challenging the existing paradigm and collaborating not only within one's own field but also with numerous other fields, emphasizing the importance of R&D innovation. In this study, the effects of R&D innovation activities, internal R&D, external R&D, on business management performance were analyzed. This study is significant in its analysis of the cause-and-effect relationship and the role of various types of innovation and will contribute to enterprises' seamless implementation of innovation activities in the future.

Keywords: Industry-university cooperation; performance; panel data analysis; moderate effect;

Reference

Yun, J.J.; Lee, M.H.; Park, K.B.; Zhao, X. Open Innovation and Serial Entrepreneurs. Sustainability, 2019, 11(18), 5055;

Yun. J.J.; Won, D.; Park, K. Dynamics from open innovation to evolutionary change. J. Open Innov. Technol. Mark. Complex. 2016.2.7

Kim. J.; Choi, S. O. A Comparative Analysis of Corporate R&D Capability and Innovation: Focused on the Korean Manufacturing Industry. J. Open Innov. Technol. Mark. Complex. 2020.10.1

Song. H. Comparative Analysis and Implications of R&D Capability of Local Enterprises. Kiet Induatrial Econ. 2009, 10, 50–60.

Yun, J.J.; Won, D.; Park, K. Dynamics from open innovation to evolutionary change. J. Open Innov. Technol. Mark. Complex. 2016, 2, 7.

1. Park, H.S. Technology convergence, open innovation, and dynamic economy. J. Open Innov. Technol. Mark. Complex. 2017, 3, 24.

41.

The Factors Affecting Technology Commercialization of Government Research Institutes: Focusing on professional human resource

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Abstract

This study analyzed the factors affecting technology transfer of Korea's government-funded research institutes(GRIs) from the perspective of resource-based view. This research can be particularly meaningful as it explored in moderating effects on the relationship between the independent variables, which are research resources, research capacity and technology commercialization capacity, and the dependent variables, which are technology transfer performances. This paper conducted panel data analysis on 24 GRIs under the National Research Council of Science and Technology(NST) over five years from 2015 though 2019. Recently there seems to have been some controversy over the expertise of GRIs' technology licensing offices(TLOs) and this study could help predict how the TLO's expertise affects technology transfer to some extent.

Keywords: Achievements in technology transfer, expertise in organizations dedicated to technology transfer, government-funded research institutes, open innovation

Reference

Yun, J.J.; Jeong, E.; Yang, J. Open innovation of knowledge cities. J. Open Innov. Technol. Mark. Complex. 2015, 1, 16.

Hwang, B.Y.; Jun, H.J.; Chang, M.H.; Kim, D.C. Efficiency Analysis of the Royalty System from the Perspective of Open Innovation. *J. Open Innov. Technol. Mark. Complex.* **2018**, *4*, 22.

Yun, J.J.; Jeong, E.; Lee, Y.K.; Kim, K.H. The effect of open innovation on technology value and technology transfer: A comparative analysis of the automotive, robotics, and aviation industries of Korea. Sustainability 2018, 10, 2459

Ferreira-Oliveira, A.T.; Keating, J.; Silva, I. Sustainable HRM as a Pathway to Sustainability—HRMS Relevance on Affective Commitment through Organizational Trust. *Sustainability* **2020**, *12*, 9443.

Kim, D.; Yeom, S.; Ko, M.C. The Interactive Effect of Government Financial Support and Firms' Innovative Efforts on Company Growth: A Focus on Climate-Tech SMEs in Korea. *Sustainability* **2020**, *12*, 9666.

Kang, J.-H.; Ji, Y.-H.; Baek, W.-Y.; Byon, K.K. Structural Relationship among Physical Self-Efficacy, Psychological Well-Being, and Organizational Citizenship Behavior among Hotel Employees: Moderating Effects of Leisure-Time Physical Activity. *Int. J. Environ. Res. Public Health* **2020**, *17*, 8856.

42.

What are the Strategies for Jobs Creation through Medical Tourism in Korea?

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Abstract

Purpose/ Research Question:

Medical tourism is a fast-growing industry around the world [1]. In order for it to thrive, there is a need for cooperation between the healthcare and tourism industry and the government organizations that oversee them. In order to make full use of medical tourism resources, stakeholders and infrastructures capable of collaborating with related organizations; should be in place. Infrastructure built for the medical tourism industry has a decisive influence on the quality of medical services [2]. Therefore, governments and local communities should make various efforts to build a community-based medical tourism infrastructure, encourage researches (on revitalizing medical tourism), protect property rights, and invest in infrastructure. South Korea experienced substantial increase in the number of foreign patients visiting the country for medical treatments. In fact, by 22.7% increase annually, the figure for arrival foreign patients soared from 60,201 in 2009, to 378,967 in 2018. [3]. The Korean medical tourism market is strengthening its competitiveness by offering the government's support policy, which offers lower prices, faster and professional services while equipped with modern medical technology [4].

Fostering medical tourism professionals to form and develop the medical tourism market through them is one of the essential factors for the vitalization of medical tourism. Providing adequate medical care to foreign patients requires professional staff to carry out marketing, interpretation services, customer services, and to serve as mediators between patients, medical staff, and tour operators. The development of the medical tourism industry is a combination of the ability to understand complex travel arrangements, foreign language interpretation, and understand cultural barriers, where skilled personnel with the ability to recognize valid regulations and current legal framework are important to the development of the medical tourism industry [5].

The majority of foreigners who immigrated to South Korea for the purpose of marriage and are mostly from the countries which South Korea welcomes foreign workers [6]. In 2018, the number of marriages was 257.6 thousand. The number of marriages with foreign spouses has increased by 1.9 thousand (8.9%) to 22.7 thousand in 2018 [7]. Representatives of the workforce in the local community are marriage migrants, immigrants. It is noteworthy that about 20% of marriage migrants and immigrants in South Korea are high-quality graduates with university degrees or higher education, but it is difficult for these to find employment [8]. One of the solutions to create social value in the

multicultural era is to nurture these immigrants as medical tourism professionals (International Medical Tourism Coordinators.). Recently, people from various countries such as China, Vietnam, Middle East, Mongolia, Russia, and Central Asia visit South Korea. The main advantage of marriage migrants is a foreign language ability. The language ability plays an essential role working as a medical tourism coordinator with completion of basic medical tourism training course. We can also include foreigners who were naturalized as Korean citizens with excellent language skills and Korean university students with foreign language abilities. University students majored in international trade, management, foreign languages, nursing, and public healthcare have good prerequisites to become international medical tourism coordinators [9].

In addition, there is a need for a process of sharing and cooperating with medical institutions, medical tourism policy managers in the country or local community, and medical tourism-related companies to promote community-based medical tourism. Employment support projects should be maintained, and efforts should be made to build medical tourism infrastructure and attract private investment [10]. By establishing and implementing a comprehensive medical tourism business model that suits the regional characteristics, it will lead to the revitalization of the community-based medical tourism industry.

Our research question is how to create jobs for medical tourism professionals. Therefore, this study investigate what kind of professional manpower is needed in community –based medical tourism and the professional hopes of marriage migrants and university students with excellent language skills for this. The survey was conducted in the North Chungcheong (hereafter NC) province of Korea. In the case of NC province, which is a central province in South Korea, despite administrative efforts to increase medical tourism, the number of attracting foreign patients and the profit of medical tourism are lower compared to other provinces and regions [2]. Therefore, it is urgent to establish a community-based medical tourism business model by fostering international medical tourism experts who can create social value through community-level efforts.

Key Literature Reviews:

Medical tourism can be found in history thousands of years ago. In ancient Greece, pilgrims and patients came from all over the Mediterranean Sea to the sanctuary of healing god Asclepius, at Epidaurus to get medical care. In the past 2,000 years, in Roma, people visited a specific shrine to bathe in remote areas. From the Neolithic period, people have traveled a long distance to specific geographic locations across Europe to perceive health benefits. This practice continued in various forms throughout the Middle Ages. By the 18th century, the upper strata of European classes often traveled across borders to bathe in hot springs for medical purposes [11].

Carrera and Bridge [12] define medical tourism as "one's organized travel outside one's local environment for the maintenance, enhancement, or restoration of as one's well-being in mind and body. The Korea Medical Tourism Association defines medical tourism as a process of going out of the residential country for medical treatment. This description is in line with the definition provided by the General Agreement on Trade in Service of the World Trade Organization.

The size of the medical tourism industry is expected to grow at an average annual rate of 15% despite the global economic downturn, to reach $165.3 billion by 2023. India, Malaysia, the United States, and the United Kingdom have promoted medical tourism at the national level, the scale of the medical tourism industry has grown rapidly in developing countries over the past decade. In Southeast Asia and other Asian countries, medical tourism is rapidly expanding, and countries are fiercely competing with service and marketing strategies around the world [13]. Especially in India, Singapore, Thailand, Malaysia, and other Asian countries, medical tourism shows rapid growth. For example, the medical tourism industry in India has grown at an annual average rate of 30% over the last decade. One study has shown the potentiality to contribute up to 25% of gross domestic product (GDP) over the

next five years. India makes tourism a major driving force for economic growth and serves as the most substantial employment creation method for poverty reduction [14].

South Korea is one of the countries, where medical tourism is under development, follows the trend and allowed medical tourism organizations and agencies to attract foreign patients. In 2009 the Korean government amended related medical laws and promotion of medical tourism have vigorously advanced on the establishment of the appropriate system, and the mandatory reporting on foreign patients [3]. According to the Ministry of Health and Welfare, South Korea attracted 360,000 medical tourists in 2016 and generated medical revenues of 860 billion won. Given the additional income from tourism, the size of the medical tourism industry has grown rapidly over the past decade [2].

The strengths of medical tourism in South Korea are medical technology, services, tourism resources, and reasonable prices. Medical technology and its level are the highest in Asia and reach 80% to 90% of developed countries. Prices are lower than China's international hospitals and are similar to Singapore's for-profit hospitals. Despite these excellent tourism resources and potentials, the development of the medical tourism industry in South Korea has not been as expected. According to the report on 'development policy of the medical service industry,' the world medical tourism has increased by 100 billion US dollars. However, the appeal to South Korea is less than 1%, which means that medical tourism in South Korea is still in its infancy. Nevertheless, thanks to the K-Pop Wave, more and more tourists from China and Japan are visiting South Korea to undergo cancer screening, cardiac surgery, and LASIK surgery [15].

Rokni [5] proposed three issues to be addressed in the government and the local community to develop the medical tourism industry in South Korea. South Korea is one of the major medical tourism destinations based on new medical technology that it should build a sophisticated infrastructure to provide high-quality medicines and medical tourism services, provide training programs for future international medical tourism professionals, which should play a role of promoting private investment in the field of medical tourism.

The employment incidence factor in the medical tourism industry is more than twice as high as in the manufacturing industry, and the employment incidence factor in the health and social welfare service industry is more than twice as high as in the manufacturing industry. The demand for medical tourism professionals will increase according to the size of the medical tourism industry, which is gradually expanding, and the development of regional-specific medical tourism can be an alternative to solve local job problems. As medical tourism became a growing industry, the necessity for those who can facilitate medical tourism obtain diverse training by different organizations in order to match the demand. In 2013 the Korean government introduced the International Medical Tourism Coordinator Certificate. The International Medical Tourism Coordinator is a specialist who provides practical services to foreign patients who visit South Korea for medical tourism. The task of medical tourism coordinators mainly supports interpretation between foreign patients and medical staff. Medical tourism coordinators also assist in tasks such as medical tourism counseling, service support management, tourism service, medical tourism marketing, and administrative procedure management.

The international medical personnel are categorized as part of patient attraction, medical service, and tourism service. Medical tourism companies that attract medical tourists and medical institutions are recruiting, introduces, and recruites medical tourism promoters and foreign patients. In the field of medical services, medical interpreters, international medical tourism coordinators, etc., oversee medical interpretation, reservation, visa, insurance, and complaint management to help the recipient receive medical services efficiently. In the field of tourism, there are occupations such as tourism interpreter, medical tourism marketer, etc., and belong to certain companies and medical institutions to serve as local tourism, shopping, and leisure guide [16]. In case of attracting patients, the role is to recruit, introduce, and escort patients in order for them receive medical treatment in the domestic medical institutions. Therefore, medical tourism professionals can be divided into categories of

attracting patients, health care, and tourism service.

Design/ Methodology/ Approach:

This study investigates the prospects of marriage migrants and immigrants from NC province, as well as universities students for their careers as international medical tourism specialists in which two separated questionnaires were collected. By using mixed methods this study also connects with the Focus Group Interviews (FGI). The overall research flow of this study is shown in figure 1.

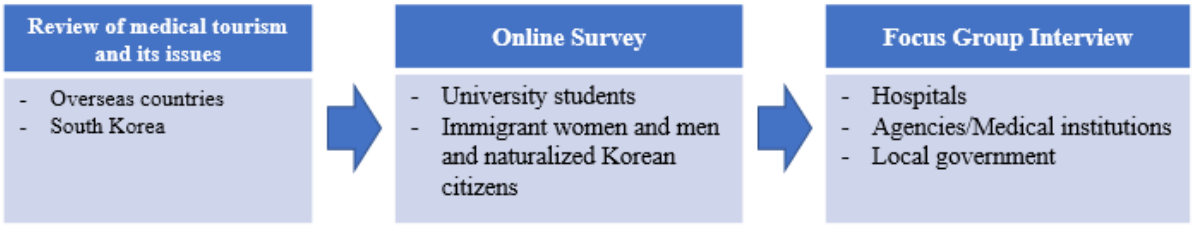

Figure 1. Process of the research.

In order to analyze the necessity of international medical tourism professionals in NC Province, we conducted two online surveys in NC Province from October 3 to October 13, 2020, as shown in table 2. The first survey was conducted among 80 university students majoring in related fields (healthcare, linguistics, and nursing students). The second survey was conducted among 31 marriage migrants and immigrants in order to investigate the demand for international medical tourism professionals in NC Province. The participants understood the purpose of the study and agreed to participate in the study. Data from 111 participants in total were collected through online questionnaires.

Interviews with expert groups of medical and administrative organizations were conducted on the vitalization of the medical tourism sector and the support for job creation related to medical tourism through community connection. A questionnaire with 43 questions, which was conducted among marriage migrants and university students, were asked to be filled via google survey. Upon completion of the online survey, professionals in the field of medical tourism, as mentioned earlier, were asked for individual interviews. After the individual interviews were done, they were summoned for a group discussion.

(Expected) Findings/Results:

It is expected that this study will be able to clarify the employment demands of immigrants and university students in the medical tourism field through questions about 1) the perception of immigrants and college students about the medical tourism industry in Korea, 2) the intention to work in the medical tourism field, 3) the intention to work as a medical tourism coordinator, marketer, and translator, and 4) an company or institution that wishes to work in the medical tourism field

Research limitations/ Implications:

This study suggests the establishment of a regional medical tourism support center that can utilize various resources such as medical, tourism, human resources, and technology available in the community, and realize social value by nurturing and utilizing excellent medical tourism professionals. This can reduce the burden on vitalizing the tourism industry in local governments, make them more specialized, and build sophisticated infrastructure among the resources of the community. In addition, the local community can reign as a research and development institution for regional specialty medical tourism products and can foster professional manpower such as international medical tourism coordinators and medical interpreters.

Since this study is limited to the Chungbuk region, there are difficulties in generalization, but it can provide implications for countries that pursue medical tourism such as Korea.

Keywords: medical tourism; job creation; survey; focus group interview

Reference

Ile, F. L., Țigu, G. Medical tourism market trends-an exploratory research. *In Proceedings of the International Conference on Business Excellence.* **2017** 11(1), 1111-1121.

Jun, J., Oh, K.M. Framing risks and benefits of medical tourism: a content analysis of medical tourism coverage in Korean American community newspapers. *Journal of health communication*. **2015** 20(6), 720-727.

Jeong, C.S. *Korea Medical Tourism Marketing. Present and Future of Medical Tourism in Korea*; Korea Tourism Organization, the Republic of Korea, **2016.**

Hodges, J. R., Turner, L., Kimball, A. M. *Risks and challenges in medical tourism: understanding the global market for health services*; Praeger, US, **2012**.

Rokni, L., Avci, T., Park, S. H. Barriers of Developing Medical Tourism in a Destination: A Case of South Korea. *Iranian journal of public health*. **2017**, *46(7)*, 930-937.

Kang, S.W. *Marriage and Divorce Statistics in 2018*; Statistics Korea, the Republic of Korea, **2019**.

Kwon, M.H. A study on application plans of immigrant married women as international medical tourism coordinators. *Social Economy and Policy Studies*. **2016**; 5 (2), 1-44.

Ahn, H.K., Park, D.H., Ha, B.J., Jang,B.J. Research of curriculum development direction through medical tourism demand analysis. *Northeast Asia Tourism Research*. **2012**; 8(4): 205-224.

The Organisation for Economic Co-operation and Development(OECD). *OECD Tourism Trends and Policies 2018*; OECD Publishing, Paris, **2019**.

Han, D.W., Cho, H.C., Kim, E.J., Oh, S.M. *Statistics on international Patients in Korea, 2017*; Korea Health Industry Development Institute(KHIDI), the Republic of Korea, **2017**.

Goodrich, J. N. Socialist Cuba: A Study of Health Tourism. *Journal of Travel Research*. **1993**. *32(1)*, 36-41.

Carrera, P.M., Bridges, J.F.P. Globalization and healthcare: Understanding health care and medical tourism. *Expert Review of Pharmacoeconomics and Outcomes Research.* **2006**. 6(4): 447-454.

Connell, J. Contemporary medical tourism: Conceptualisation, culture and commodification. *Tourism Management*. **2013**, *34*, 1–13.

Sharma, A., Rao, P. S., Pathi, S. N. Health Tourism and Its Impact on Economy. *IOSR Journal of Humanities and Social Science*. **2015**, *20(3)*, 89-92.

Lee, K.S., Lee, J.M. *A Study on Policy Issues for the Development of the Medical Service Industry*; Korea Chamber of Commerce, the Republic of Korea, **2013**.

Han, H., Hwang, J. Growing competition in the healthcare tourism market and customer retention in medical clinics: New and experienced travellers. *Current Issues in Tourism*. **2018**, 21(6), 680-702.

43.

Exploring an investment model based on collective intelligence of scientists and engineers for promising technologies

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Abstract

Purpose/ Research Question: This research aims to present an investment model for bridging so-called "Valley of Death". The term "Valley of Death" refers to challenging period for start-up companies in which they are at heightened risk of failure. Many start-up companies are heading into the "valley of death" where new technologies go to die. One of the main reasons is insufficiency of funds that invest in early-stage technology. Under this background, this paper suggests a crowdfunding platform utilizing collective intelligence of scientists and engineers for early-stage technology companies. This model enables the general public to make a judgment about investment in new technologies. A survey was conducted for experts in science and technology to investigate the reliability of other knowledge contributors and the factors affecting investment decisions.

Key Literature Reviews:

1. Lucie Povolná. Innovation Strategy in Small and Medium Sized Enterprises(SMEs) in the Context of Growth and Recession Indicators. *J. Open Innov. Technol. Mark. Complex.* 2019, *5*, 32.
2. Shinhyung Kang.; Jung Tae Hwang. Moderating Factors in Distant Investment of Corporate Venture Capital *J. Open Innov. Technol. Mark. Complex.* 2019, *5*, 19.
3. Hanjun Cho.; Joo Yeon Park.; Chang Soo Sung. The Study on the Difference in Corporate Performance and Employment Outcomes According to the Results of Equity-Based Crowdfunding Investment. *J. Open Innov. Technol. Mark. Complex.* 2019, *5*, 83.

4. Hyoung-Yong Lee.; Hyunchul Ahn. A Study on the User Acceptance Model of Mass Collective Intelligence. *JOURNAL OF INFORMATION TECHNOLOGY APPLICATIONS & MANAGEMENT*. 2010, *17*, 4.

Design/ Methodology/ Approach: (not decide yet)

1. Literature Review
2. Survey Analysis

(Expected) Findings/Results: It is expected that potential of new technological, which is difficult to grasp, can be predicted by collective intelligence.

Research limitations: An additional survey of the willingness to participate of the general public would make the investment model more complete.

Keywords: Start-up, Valley of death, Crowdfunding, Scientists and Engineers, collective intelligence, reliability of knowledge contributors

Reference

[1] Nasdaq, "Death Valley Curve Definition", https://www.nasdaq.com.

[2] Investopedia, "Death Valley Curve", https://www.investopedia.com/terms/d/death-valley-curve.asp.

44.

Recovering Covid-19 through Open Innovation:

Case of Japanese Pop Culture and Culture Tourism

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Abstract

Pandemic drastically changed the scene of pop culture industry and cultural tourism industry Japan and worldwide. Meanwhile, robotics industry is concerned as one of the solutions for the future.

This paper focuses on Gundam Yokohama Project, an moving Gundam (robot) of 18 m high. Gundam is one of the most famous manga/anime concerning robot stories in Japan. The story inspired many children and adults so that the Japanese society has welcomed the development of robotic industry. The exhibition started in December 2020 and will last till 2022. This project was conducted through the open innovation and collaboration approach.

Focusing on the Gandam Yokohama project, the paper elaborates the impact of pandemic to the Japanese pop culture and cultural tourism industries.

Purpose/ Research Question:

1. Collaboration
    1. How the collaboration of industries (robotics, pop culture and tourism) were made?
    2. What were the open innovation approach used?
2. Pandemic

1. How Covid-19 has been impacted the project?
2. How the open innovation approach helped the project in the midst of pandemic?

Key Literature Reviews:

open innovation and Covid-19

- Chesbrough, H.: To recover faster from Covid-19, open up: Managerial implications from an open innovation perspective. Industrial Marketing Management, 88, July 2020, 410-413
- Anita M. McGahan, Marcel L. A. M. Bogers, Henry Chesbrough, Marcus Holgersson; Tackling Societal Challenges with Open Innovation. California Management Review, October 2020, 0(0), 1-13.

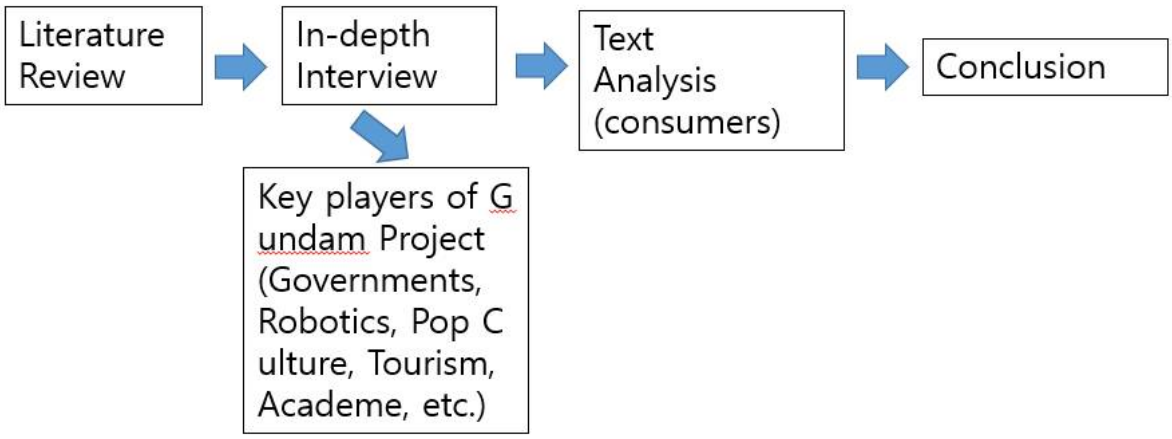
Literature of Japanese Pop Culture

- Alisa Freedman, Toby Slade (ed.). 2017. *Introducing Japanese Popular Culture.* Routledge.

Literature of Cultural Tourism

- Hilary du Cros, Bob McKercher. 2020. *Cultural Tourism*. Routledge.

Research takes following steps: 1) literature review; 2) in-depth interview of key players of Gundam project, including robotics and mechanical engineering industries, local and national governments, cultural industries, tourism industries, academics, etc.) to understand the open innovation approach and the impact of Covid-19; 3) text analysis of consumers; and 4) conclusion.



The author serves as a board members of one of the robotics and mechanical engineering companies, which assisted the project. Therefore, the interviews with key players are easy to conduct.

- Cultural tourism and popular culture, such as anime, give interesting business opportunities. On top, technologies, such as robotics, will create some future possibility of industries. Open innovation has an important role to make this project possible.
- In the midst of pandemic, the above network provides new possibilities to overcome the difficulties.

Research limitations:

1) Covid-19 situations are still evolving

2) Interview and qualitative study

3) Due to Covid-19, may be some limitation to the consumers (tourists)

Research Implications

1) In terms of impact of Covid-19 to the open innovation in Japan, provide the important insights, focusing interesting combination of culture, tourism and engineering.

2) Contribution to consider emerging issues of engineering (robotics), culture and tourism.

3) Contribution to consider emerging societies, which can be based on culture and new technologies.

Keywords:

open innovation, robotics, cultural tourism, pop culture, anime, manga

Reference:

- Anita M. McGahan, Marcel L. A. M. Bogers, Henry Chesbrough, Marcus Holgersson; Tackling Societal Challenges with Open Innovation. California Management Review,

October 2020, 0(0), 1-13.

- Chesbrough, H.: To recover faster from Covid-19, open up: Managerial implications from an open innovation perspective. Industrial Marketing Management, 88, July 2020, 410-413
- Lee, M.; Yun, J.J.; Pyka, A.; Won, D.; Kodama, F.; Schiuma, G.; Park, H.; Jeon, J.; Park, K.; Jung, K.; Yan, M.-R.; Lee, S.; Zhao, X. How to Respond to the Fourth Industrial Revolution, or the Second Information Technology Revolution? Dynamic New Combinations between Technology, Market, and Society through Open Innovation. J. Open Innov. Technol. Mark. Complex. 2018, 4, 21.
- Liu, Z.; Stephens, V. Exploring Innovation Ecosystem from the Perspective of Sustainability: Towards a Conceptual Framework. J. Open Innov. Technol. Mark. Complex. 2019, 5, 48

45.

University in industry networking through academic spin-offs. The role of open innovation

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Abstract

Purpose/ Research Question: The Universities are trying to narrow the gap between science and industry and are urging to create specific units, designing specific programs to assist in brokeraging knowledge together with academics, businesses and venture capitalists, seeking to facilitate the transfer of knowledge from academia to the industry while infusing an entrepreneurial culture of innovation. The substantial increase in corporate venture capital spending reflected more fundamental shifts. Along with venture capital, banks, individual angel investors, and corporations are among the other providers of capital for these university- industry linkages (Erkut, 2018; Jeon et al., 2015;). The spinoffs have a vital role in the knowledge and technology transfer process as contributors to the regional economic development and in the promotion of the innovation culture. As knowledge and technologies are transferred to the entrepreneurs, their enterprises can improve their operational processes, services or business models, adapting to compete with the evolving situations and demands of the market. Although participating in a knowledge and technology transfer provides benefits for university and industry, some barriers hinder this process. The existing weak links are that organizations are restricted with time constraint and cannot evaluate the quality of the invention before researchers evolve with an idea; however every idea may also have a commercial viability screening before acceptance. Industries and universities do not have a

communication cooperating conduit to present their needs and exchange development inputs or seeking solutions that make industrial operations and processes more competitive, products more attractive, and this consequently enable them to become more profitable. Furthermore University research projects tend to require long periods, while industry demands short cycles to compete in the market and achieve a competitive advantage. The catch of this scenario is the ownership bottleneck, is the intellectual property ownership, where the universities cling to being the owners of research results and therefore, being unable to market them, exists as significant impediments limiting their potential to grow. This article reviews the relationship between academic spin offs and the role of university to support entrepreneurs collocating it in the network of open innovation intermediaries and proposes a significant model that can be a spinoff support for quick, time bound, and immediate use to any industrial requirement.

Design/ Methodology/ Approach: Innovation is inter-disciplinary and embodies a remarkable commonality of purpose among the users to expand the interoperability of connected systems which encourage immediate use and function. Innovation brings a lot of benefits to the economy, diminishes wasteful productivity, reduces obsolescence, increases product reliability and facilitates life with better utilization of resources (Krishnan et al., 2018). Elaborations on innovation includes essentials such as life basics and ecology security; development & modernization in health, safety, environment, waste management, exigencies, and welfare; new technology implementations in computing, mobile, automation, space, imagery, and nano sciences; entertainment areas of cinema, dramatics, sounds, lightings, and laser displays; finally the grey- areas can still have scope for inclusion.

(Expected) Findings/Results: Knowledge is the most important resource for a firm to create a competitive advantage. The creation of new knowledge represents an important opportunity to create new business opportunities. University is considered one of the most relevant providers of knowledge and contributor to economic development of a region. The creation of knowledge per se is not enough, one of the main challenges of the university is to share knowledge with industry sectors that are more closed to the market and customers,

Research limitations/ Implications: This research could be expanded according to a quantitative method.

Keywords: open innovation, university spin-off, networking.

References

Erkut, B. (2018). The emergence of the ERP software market between product innovation and market shaping. *Journal of Open Innovation: Technology, Market, and Complexity*, 4(3), 23.

Jeon, J. H., Kim, S. K., & Koh, J. H. (2015). Historical review on the patterns of open innovation at the national level: the case of the roman period. *Journal of Open Innovation: Technology, Market, and Complexity*, 1(2), 20.

Rakthai, T., Aujirapongpan, S., & Suanpong, K. (2019). Innovative capacity and the performance of businesses incubated in university incubator units: Empirical study from universities in Thailand. *Journal of Open Innovation: Technology, Market, and Complexity*, 5(2), 33.

46.

Preliminary study on the open innovation signal of firms at financial statements

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1. Introduction; Research Question, and Research Scope & Method

1.1. Research Question

There were a lot of studies to measure open innovation of firms objectively after open innovation depth and breadth being calculated through survey results which were done based on Frascati manual(Laursen & Salter, 2006). Until now, hot issues in open innovation include not only making open innovation work, but also measure open innovation objectively including catching up of profit from it (Davila, Epstein, & Shelton, 2012). After survey based measure, another representative method to measure open innovation was to calculate open innovation from the perspective of inter-organizational knowledge flows (Chiang & Hung, 2010). Representative example of this is to measure the open innovation of any firm by multiplying open innovation breadth, and depth which were measured from collaboration patent ratio, and average co-applicant number of the firm (Yun, Avvari, Jeong, & Lim, 2014). Measuring of open innovation through intellectual capital flow from the exogenous in-flows, and exogenous out-flows is another way to measure open innovation from patent(Michelino, Cammarano, Lamberti, & Caputo, 2014).

Even though patent-based measuring of open innovation is more objective than survey-based method, more market-oriented measuring of open innovation is being required because 1) patent based open innovation measure cannot be applied to a lot of firms which do not apply so much patents; 2) patent is sometimes not close to market in firms.

In addition to these, this study started from the facts that financial statements provide important information that should be used to help guide decisions by owner of firm, or decision maker on open innovation strategy in firms(Carraher & Van Auken, 2013). We agree that open innovation measure is not just about open innovation activity, or process but also about open innovation culture or climate(Remneland-Wikhamn & Wikhamn, 2011). But, if any firm wants to measure open innovation to use open innovation strategy, the measure of open innovation activity will be needed.

Our research questions are as follows.

How can we find out open innovation signal of firm directly or indirectly at financial statements?

This research question has focal point to find out clues to evaluate of open innovation of the firm at the financial statement.

1.2. Research Scope and Method

First, we will build up model which could find out the open innovation signal of a firm from literature reviews.

Second, we will apply this model in Korean 2 successful open innovation cases, and 2 non-successful open innovation cases to validate and fascinate the model again.

Third, we will apply this model in US 2 successful open innovation cases and 2 non-successful open innovation cases to additionally validate and fascinate the model.

2. Literature Review and Research Framework

2.1. Literature Reviews

Calculative practice trigger a process of mobilization of knowledge which become part of the innovation(Revellino & Mouritsen, 2015). In addition, adoption of management accounting can measure and motivate innovation through compatibility and perceived outcomes(Ax & Greve, 2017). According to any analysis, accounting in the development of a biotech innovation had shaped some particular linkages between scientific and economic ideas and different actors(Christner & Strömsten, 2015).

Financial statements data such as financial leverage, capital turnover, asset composition, and firm size are significant factors associated with fraudulent financial reporting(Persons, 1995). R&D expenditure in financial statements has a positive effect on firm value and profitability(Chen, Cheng, & Hwang, 2005). Financial performances such as ROA have an inverted U relationship with open innovation adoption(Michelino, Lamberti, Cammarano, & Caputo, 2015b). An accounting-based framework was suggested for defining open innovation adoption modalities through the analysis of annual reports about the cost, revenues, new investments and divestments in intangibles and knowledge assets related to open innovation(Michelino, Lamberti, Cammarano, & Caputo, 2015c). Another research on bio-pharmaceutical industry measured the pecuniary dimension of inbound and outbound open innovation processes through the analysis of annual reports(Michelino, Lamberti, Cammarano, & Caputo, 2015a).

Though the increase of profitability by focusing on cost reduction, and efficiency in operation were main issues in financials in closed innovation paradigm, at the era of open innovation paradigm, new issues such as the increase of profitability through new revenue streams, balancing risk and growth strategy, sustainable and profitable growth, or customer profitability are appearing as the main issue of financials (Fasnacht, 2009, pp. 153- 172).

Like biodiversity is the sum total of all biotic variation from the level of genes to ecosystems, open innovation can exist from any department of a firm through firm to industry, regional innovation, sectoral innovation system, to national innovation system (Purvis & Hector, 2000; Yun, Won, Hwang, Kang, & Kim, 2015).

Corporate venture capital can be used as strategic objectives such as a tool for open innovation(Pinkow, Iversen, & Complexity, 2020). Customers attitudes of choice of Fintech application in Covid-19 pandemic, and the possibility of mobile money as sustainable alternative for SMEs in less developed financial markets can be understood as the possibility of additional or transferred understanding of financial statement of firms(Tengeh, Gahapa Talom, & Complexity, 2020).

3. Applying this model to 2 successful firms, and Validating model from patent and OI facts

3.1. Applying this model to 2 successful firms

4. Applying this model to 2 non-successful firms, and Validating model from patent and OI facts

4.1. Applying this model to non-successful firms

<Reference>

Ax, C., & Greve, J. (2017). Adoption of management accounting innovations: Organizational culture compatibility and perceived outcomes. Management Accounting Research, 34, 59-74.

Carraher, S., & Van Auken, H. (2013). The use of financial statements for decision making by small firms. Journal of Small Business & Entrepreneurship, 26(3), 323-336.

Chen, M.-C., Cheng, S.-J., & Hwang, Y. (2005). An empirical investigation of the relationship between intellectual capital and firms' market value and financial performance. Journal of Intellectual Capital, 6(2), 159-176.

Chiang, Y. H., & Hung, K. P. (2010). Exploring open search strategies and perceived innovation performance from the perspective of inter-organizational knowledge flows. R&d Management, 40(3), 292-299.

Christner, C. H., & Strömsten, T. (2015). Scientists, venture capitalists and the stock exchange: The mediating role of accounting in product innovation. Management Accounting Research, 28, 50-67.

Davila, T., Epstein, M., & Shelton, R. (2012). Making innovation work: How to manage it, measure it, and profit from it: FT press.

Fasnacht, D. (2009). Open Innovation in the financial services: growing through openness, flexibility and customer integration: Springer Science & Business Media.

Laursen, K., & Salter, A. (2006). Open for innovation: the role of openness in explaining innovation performance among UK manufacturing firms. Strategic Management Journal, 27(2), 131-150.

Michelino, F., Cammarano, A., Lamberti, E., & Caputo, M. (2014). Measurement of open innovation through intellectual capital flows: framework and application. International Journal of Intelligent Enterprise, 2(2-3), 213-235.

Michelino, F., Lamberti, E., Cammarano, A., & Caputo, M. (2015a). Measuring open innovation in the Bio-Pharmaceutical industry. Creativity and innovation management, 24(1), 4-28.

Michelino, F., Lamberti, E., Cammarano, A., & Caputo, M. (2015b). Open innovation in the pharmaceutical industry: An empirical analysis on context features, internal R&D, and financial performances. IEEE transactions on engineering management, 62(3), 421-435.

Michelino, F., Lamberti, E., Cammarano, A., & Caputo, M. (2015c). Open models for innovation: an accounting–based perspective. International Journal of Technology Management, 68(1-2), 99-121.

Persons, O. S. (1995). Using financial statement data to identify factors associated with fraudulent financial reporting. Journal of Applied Business Research (JABR), 11(3), 38-46.

Pinkow, F., Iversen, J. J. J. o. O. I. T., Market,, & Complexity. (2020). Strategic Objectives of Corporate Venture Capital as a Tool for Open Innovation. 6(4), 157.

Purvis, A., & Hector, A. (2000). Getting the measure of biodiversity. Nature, 405(6783), 212. Remneland-Wikhamn, B., & Wikhamn, W. (2011). Open innovation climate measure: The introduction of a validated scale. Creativity and innovation management, 20(4), 284-295.

Revellino, S., & Mouritsen, J. (2015). Accounting as an engine: The performativity of calculative practices and the dynamics of innovation. Management Accounting Research, 28, 31-49. Tengeh, R. K., Gahapa Talom, F. S. J. J. o. O. I. T., Market,, & Complexity. (2020). Mobile money as a sustainable alternative for SMEs in less developed financial markets. 6(4), 163.

Yun, J. J., Avvari, M. V., Jeong, E.-S., & Lim, D.-W. (2014). Introduction of an objective model to measure open innovation and its application to the information technology convergence sector. International Journal of Technology, Policy and Management 7, 14(4), 383-400.

Yun, J. J., Won, D., Hwang, B., Kang, J., & Kim, D. (2015). Analysing and simulating the effects of open innovation policies: Application of the results to Cambodia. Science and Public Policy, 42(6), 743-760.

47.

Forecasting trend of technology changes in senior-friendly industry approaching through patent analysis

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Abstract

Purpose/ Research Question

The senior-friendly industry refers to an industry that meets the demand arising from biological aging of the elderly and the decline in social and economic capabilities. As the economy development have caused the nutrition and hygiene to improve and health, and medical technology advances also have led the life expectancy increases significantly. In that ways, as the life expectancy is greatly increased socially, it is rapidly entering an aging society with the severely declining in the fertility rate in the Republic of Korea.

In accordance with the Age-Friendly Industry Promotion Law, it is classified nine categories of industry area defining products primarily used by the elderly such as welfare supplies, medical equipment, information equipment, housing, etc. and services including business research, development, manufacturing, construction, provision, distribution, or sales of medical care, finance, assets, leisure, tourism and culture.

In the Republic of Korea, the first generation of baby boomers born in from 1955 to 1963 entered the elderly in earnest from 2020. A total number of 71.2 million people until the last age of the first baby boomers generation is similar that of currently 65 years old or older people. Adding 6.27 million of second baby boomer generation born in from 1968 to 1974, they make up 26.1% of the total population in the Republic of Korea soon.

It is expected that the proportion of production decreases, but demand from the elderly increases as the baby boom generation, which used to be a “producible population,” enters the elderly. Also, the size of age-friendly business market could be expanded with explosive growth in locally and globally.

The revitalization of the aged-friendly industry is an industry that can be used as an effective means to cope with financial risks, low growth risks from the government side, and health risks, financial risks and life risks from the elderly side. However, there are limitations in supporting industries and establishing related policies as the technology level related to the aged-friendly industry and the technology gap with advanced countries are not clearly presented. Therefore, the purpose of this paper is to illuminate domestic and international technology trends as an indicator of technology trends of the age-friendly industry and to provide objective patent information necessary for use in discovering major issues related to technology development in the age-friendly industry and establishing national policies.

Therefore, the purpose of this study is to illuminate domestic and international technology trends as an indicator of technology trends of the age-friendly industry and to provide objective patent information necessary for use in discovering major issues related to technology development in the age-friendly industry and establishing national policies. For this, a framework for analyzing the quantitative and qualitative characteristics of patents was prepared and systematic analysis was conducted.

Key Literature Reviews

Eun et al. (2012) showed the possibility of technical trend and future development direction of machine tools feed drive system by patent mapping. Both private and public enterprises have great interest in prior knowledge of emerging technologies to enable them make strategic investments. Technology forecasting offers a relevant opportunity in this direction and is currently a hot upcoming area of research. However, accurate forecasting of emerging technologies is still problematic mainly due to absence labeled historical data to use in training of learners. Previous studies have approached the technological forecasting problem through unsupervised learning methods and, as such, are missing out on potential benefits of supervised learning approaches such as full automation. In this study, we propose a novel algorithm to automatically label data and then use the labeled data to train learners to forecast emerging technologies. As a case study, we used patent citation data provided by the United States Patent and Trademark Office to test and evaluate the proposed algorithm. The algorithm uses advanced patent citation techniques to derive useful predictors from patent citation data with a result of forecasting new technologies at least a year before they emerge. Our evaluation reveals that our proposed algorithm can retrieve as high as 70% of emerging technologies in a given year with high precision.

Moses et. al. (2017) forecasted emerging technologies through a supervised learning approach with patent analysis. Both private and public enterprises have great interest in prior knowledge of emerging technologies to enable them make strategic investments. Technology forecasting offers a relevant opportunity in this direction and is currently a hot upcoming area of research. However, accurate forecasting of emerging technologies is still problematic mainly due to

absence labeled historical data to use in training of learners. Previous studies have approached the technological forecasting problem through unsupervised learning methods and, as such, are missing out on potential benefits of supervised learning approaches such as full automation. In this study, we propose a novel algorithm to automatically label data and then use the labeled data to train learners to forecast emerging technologies. As a case study, we used patent citation data provided by the United States Patent and Trademark Office to test and evaluate the proposed algorithm. The algorithm uses advanced patent citation techniques to derive useful predictors from patent citation data with a result of forecasting new technologies at least a year before they emerge. Our evaluation reveals that our proposed algorithm can retrieve as high as 70% of emerging technologies in a given year with high precision.

Hidemichi and Shunsuke(2018) suggested the trends and priority shifts in artificial intelligence technology invention with global patent analysis. This study is the first to apply a decomposition framework to clarify the determinants of AI technology invention. Consisting of 13,567 AI technology patents for the 2000–2016 period, our worldwide dataset includes patent publication data from the U.S., Japan, China, Europe, and the Patent Cooperation Treaty (PCT). We find that priority has shifted from biological and knowledge-based models to specific mathematical models and other AI technologies, particularly in the U.S. and Japan. Our technology type and country comparison shows that the characteristics of AI technology patent publication differ among companies and countries.

Design/ Methodology/ Approach

First, the main keywords of the search formula were selected for each of the nine detailed classifications of the aged-friendly industry in selecting the keywords for the aged, nursing industry, pharmaceutical industry, food industry, supplies industry, medical device industry, financial industry, residential industry, and leisure industry for the Republic of Korea, the United States, Japan and Europe. After that, a search formula was created with a combination of related keywords, and the existence of a patent included in the technology was investigated.

Second, for the derived patents, the criteria for selecting effective patents for age-friendly technology were established and applied. For the population, patents with high direct correlation with the aged-friendly industry were selected as valid patents based on keywords and combinations that have a direct connection for each technology classification, centering on the existence of keywords related to 'age' in the name, summary, and representative claims of the invention. For the population, patents with high direct correlation with the aged-friendly industry were selected as valid patents based on keywords and combinations that have a direct connection for each

technology classification, centering on the existence of keywords related to 'age' in the name, summary, and representative claims of the invention.

Third, patent trend analysis, target patents are classified by country, technology, and applicant was followed by analyzing the number and ratio of each patent application. Through this, basic data on the identification of major applicants and application trends in the technology field of the aged-friendly industry were presented.

ㅇ Cities Per Patent(CPP) CPP = Number of citations of registered patents / Number of registered patents
- Indicates the number of times a specific registered patent has been cited by other patents. From the viewpoint of the patentee, the higher this value, the higher the probability of having a patent with excellent quality. Patent holders with highly cited patents can occupy an advantageous position in the competition. - The higher the CPP value, the higher the likelihood of holding a number of core patents or original patents of high quality.
ㅇ Patent Family Size(PFS) PFS = Average number of patent families of Applicant (owner) / Total average number of patent families
- Patents filed in each country for an invention are referred to as family patents. Since patents are filed overseas only when there is a commercial interest or technical competition in the relevant country, it is judged that the marketability through patents is high when the number of family patents is large, and this is used as an indicator of market security. - The number of families by applicant nationality indicates which of the technology-holding countries are engaged in technology development activities in various markets, so through this analysis, it is possible to understand which R&D fields targeting the global market in the relevant technology field.

(Expected) Findings/Results

The subject of patent analysis was applied to valid patents that have been applied, published, and registered in the last 30 years, excluding the undisclosed section of 2019 and 2020. This is because the period was selected so that Japan's patent trends, which showed active research activities in the

early stages of R&D, can be checked without omission among the four major IP countries (the Republic of Korea, Japan, the United States and Europe). Accordingly, the total number of effective patents used for analysis is 9,009. As a whole, the country under analysis showed a rapid increase in filings from the 1990s to the early 2000s, and since then, it has repeatedly increased and decreased until recently, showing an average of 360 filing activities. Considering that applications appear to be maintained after 2019, which is the undisclosed section, it is expected that continued applications will continue in the future.

In addition, through the patent citation/citation index provided through registered patents and the market acquisition index using family patent information, the qualitative level and market securing power of major applicants were analyzed.

Research limitations/ Implications

The details to be noted when interpreting the results of this study are as follows: 1) all applicant countries are subject to the principle of subjugation, that is, patents obtained in different countries for the same invention each independently survive and extinguish in accordance with the laws of the respective countries; and 2) accordingly, by comparing the market and development status of the technology by application country, it is possible to determine which market is active and how far the technology development has progressed. Nonetheless, this study is confined to 4 countries and does not include emerging countries developing the relevant technologies such as China, India and others, it is judged that it is reasonable to select and analyze as major applicant countries as these 4 countries recognized aging as a social issue from an early age and developed related technologies. Therefore, caution should be taken in interpreting the results of this study.

Keywords: patent analysis, technology forecasting, age-friendly, elderly, silver business, text analysis

Reference

Moses N.K, Ge C., Yunqing H., Chunhui H., and Zhenyu Z. (2017). Forecasting emerging technologies: A supervised learning approach through patent analysis, Technological Forecasting and Social Change, 125, 236-244.

Eun I. U., Chee H. S., and Ji Won Lee. (2012), The Technical Trend and Future Development Direction of Machine Tools Feed Drive System by Patent Mapping, Journal of the Korean Society for Precision Engineering, 29(5), 510-515.

Hidemichi H. and Shunsuke M. (2018). Trends and priority shifts in artificial intelligence technology invention: A global patent analysis, Economic Analysis and Policy, 58, 60-69.

48.

Dynamic impact of uncertainties on R&D configuration and innovation performance

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Abstract

To cope with uncertainties, firms have diverse R&D investment strategies for innovation to maintain market or industry status. This paper categorized diverse properties uncertainties into perceived and real-indicated environmental uncertainties, and examines the influence on R&D configuration and innovation performance. The results suggest that perceived environmental uncertainties (PEU) are more strongly linked to internal R&D investment ratio than real-indicated uncertainties (RIU) particularly for innovative firms. Also, PEU are positively and RIU are negatively associated with innovation. Meanwhile, the share of internal R&D investment negatively moderates PEU, yet positively moderates RIU. Overall, this paper provides empirical evidence of the impact of perceived uncertainties which only theoretically tackled, and also expanding the uncertainty from R&D configuration to innovation performance relationship.

Key words: Perceived uncertainty, Real-indicated uncertainty, R&D configuration, Innovation performance, Manufacturing industry

49.

Forecasting Technology Economic Lifetime based on Deep Learning: In Perspective of Activating Open Innovation

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Abstract

Purpose/ Research Question:
This research seeks to answer the basic question like:

1. How can we predict the economic life of each patent reliably?
2. Is the calculation standard of TCT that is currently used as the standard for the life of technology appropriate?
3. Is it possible to estimate the economic life of technology faster and more objectively, not directly evaluated by experts?
4. Can the qualitative value of a patent be quantified and applied to deep learning algorithm?
5. Will the economic life of technology estimated based on deep learning, and the economic life of technology directly evaluated based on TCT by experts lead to similar results?

Key Literature Reviews:

Although the innovative introduction of a new technology called the Fourth Industrial Revolution is being applied to the entire industry, the recent economic recession and low growth seem to have established themselves as a global economic trend rather than a temporary phenomenon. In this economic situation, companies must create new sources of income through the introduction and convergence of new technologies and active R&D. However, it is a reality that there is a limit in the already advanced technology environment for companies to increase their economic productivity by using only their internal capabilities. In other words, from the viewpoint of open innovation that has recently emerged, companies need to pursue cooperative corporate innovation by actively grafting superior external technologies and knowledge [1,2].

Estimating the economic life of technology is essential when performing income approach-based evaluation in the technology valuation which is for technology-based economic activities [3]. Economic life of technology refers to a future period when factors that have a negative effect on commercialization using a particular technology asset arise and the technology asset loses its competitive advantage in the market. In other words, the period during which a business based on a particular technology maintains a competitive advantage can be defined as the economic life of technology. The point to consider is that economic life of technology is a concept that differs from the legal protections period or useful life of a patent, and that all environmental factors in which the technology is used must be taken into account when estimating this.

In general, income approach estimates the economic life of technology based on the TCT (Technology Cycle Time) that shows the rate of change in the technology group to which the patent belongs by utilizing the citation frequency of individual patents within the technology group. TCT is a statistical analysis of the citation period between forward cited patents and backward cited patents classified by IPC (International Patent Classification) and is an index that indirectly shows the rate of change in the technology group to which the patent belongs [4]. TCT can produce statistical data such as mean, Q1, Q2, Q3 per IPC subclass. Considering that it is common for TCT to show asymmetric distribution with positive skewness, Q2 (median) is used as a sign value for TCT [5].

The TCT produced as above is an approximate estimate of the technology life of each IPC subclass, and in practice, individual patents may have an economic life that is different from these TCTs. For example, the economic life may fluctuate depending on the industry conditions, economic situation and the possibility of the emergence of competing technologies. That is, there may be many extrinsic characteristics that are difficult to calculate with other general statistics. To compensate for these limitation of TCT, in Korea's technology valuation, experts directly and qualitatively evaluate extrinsic factors that may affect the economic life of technology to be evaluated and conjunction them with the TCT to calculate the final economic life of technology [6-7]. At this time, if the estimated economic life of technology is derived longer than the legal

protection remaining period of the patent right, the legal protection remaining period is applied as the economic life of technology.

Table 1. Evaluation table of technology life factor

Division	Factor
Technology Factor	Possibility of emergence of alternative technologies
	Technical superiority
	Technology competitiveness
	Imitation difficulty
	Scope of right
Market Factor	Market concentration
	Changes in market competition
	Expects market share
	Product appearance frequency

The formula of economic life of technology, which comprehensively reflects TCT and score of technology life factor, is as follow [7,8].

$$\begin{aligned} Economic\ life\ of\ technology_i &= f(TCT_i, TLF_i) \\ &= TCT_{Q2,i} + \left(TCT_{Q3,i} - TCT_{Q2,i}\right) \times \frac{TLF_i - RefTLF}{MaxTLF - RefTLF} \quad (if\ TLF_i \geq RefTLF) \\ &= TCT_{Q1,i} + \left(TCT_{Q2,i} - TCT_{Q1,i}\right) \times \frac{TLF_i - MinTLF}{RefTLF - \mathrm{MinTLF}} \quad (if\ TLF_i < RefTLF) \end{aligned} \tag{1}$$

$$where\ TLF\ is\ the\ score\ of\ techonology\ life\ factor,$$
$$RefTLF\ is\ reference\ of\ TLF,$$
$$MaxTLF\ is\ Maximum\ value\ of\ TLF\ can\ represent,$$
$$MinTLF\ is\ Minimum\ value\ of\ TLF\ can\ represent.$$

Design/ Methodology/ Approach:

In this study, the intrinsic and extrinsic indicators of a patent are applied to deep learning to estimate the economic life of technology. When constructing the train data set, all data will use the patent from 2000 to 2020, considering that the legal maximum useful life of the patent is 20 years. In other words, all patents used for train data set are composed of patents whose economic life has expired. The target of each patent is the period that the technology has maintained until expiration after registration of patent, that is, the economic life of technology.

Patent data used in this study utilized bulk data provided in real time by KIPRIS (Korea Intellectual Property Rights Information Service) [9]. This data has about 4 million Korean patent information which is applied and registered since 1948, and it covers the intrinsic information of patent, including patent bibliographic information and patent specifications, abstract, registration and administrative information. In addition, the extrinsic indicators [10,11] that can reflect the characteristics of the technology environment and ecosystem to which patent belong, which are difficult to reflect as intrinsic indicators, was added to enable diverse interpretations of patents subject to evaluation.

Finally, the intrinsic and extrinsic indicators of each patent are applied to input layer, and the train performed by estimating the economic life of each patent as defined above. And lastly, we evaluate the performance of trained model using the economic life of technology data which experts directly evaluated.

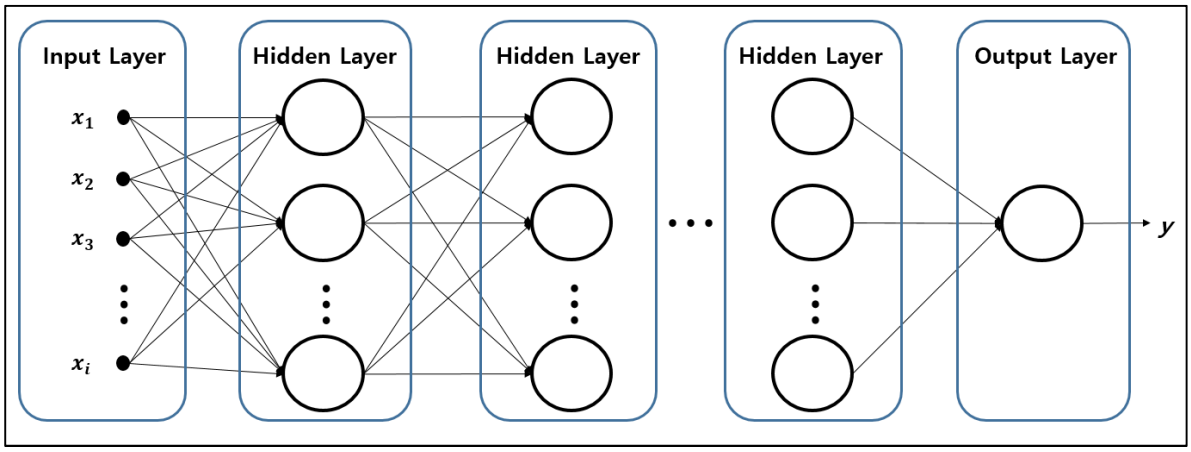

Figure 1 Structure of DNN

(Expected) Findings/Results:

This study proved that the economic life of each patent can be predicted based on the intrinsic and extrinsic indicators of the patent. This is meaningful in that it is possible to predict the technology life of each patents rather than the life of the existing TCT-based IPC subclass standard technology.

Research limitations/ Implications:

The technology life estimation model of individual patents applied in this study attempted to overcome the limitations of the methodology based on direct expert estimation in the existing technology valuation. The prediction model proposed in this paper does not reflect the subjectivity

of experts compared to the existing methodology, it is possible to evaluated more reliable technology value. In addition, R&D decision makers of general companies, not technology valuation experts, can easily judge the economic value of technology based on this model. This effective information provision method for corporate decision-making can effectively contribute to corporate strategy establishment of open innovation perspective.

Keywords: Economic life of technology, TCT, Deep learning, patent, technology, open innovation, technology finance

Reference

Hwang, B.Y.; Jun, H.J.; Chang, M.H.; Kim, D.C. Efficiency Analysis of the Royalty System from the Perspective of Open Innovation. *J. Open Innov. Technol. Mark. Complex* **2018***, 4, 22.*

Yun, J.J. How do we conquer the growth capitalism? Schumpeterian Dynamics of Open Innovation. *J. Open Innov. Technol. Mark. Complex* **2015***, 1, 17.*

Lee, J.H.; Sung, T.-E.; Kim, E; Shin, K. Evaluating Determinant Priority of License Fee in Biotech Industry. *J. Open Innov. Technol. Mark. Complex* **2018***, 4, 30.*

Park, G.; Shin, J.; Park, Y. Measurement of depreciation rate of technology knowledge: Technology cycle time approach. *Journal of Scientific & Industrial Research* **2006**, *65*, 121-127.

Lee, J.; Park, H.-W. Study for change of economic life of technology (TCT, technology cycle time). *Proceedings of the Korea Technology Innovation Society Conference* **2018**, 496-505.

Oh, D.; Lee, J.; You, W.; Kim, S. Technology Valuation Method for Improving Its Reliability to Expand Technology Transfer Market. *Journal of Technology Innovation* **2014**, *22*, 3, 287-310.

Ministry of Trade, Industry and Energy. Republic of Korea. Practical Guide of Technology Valuation, 2017.

Korea Technology Finance Corporation. Republic of Korea. Practical Manual of Technology Valuation, 2019.

KIPRIS. Available online: kipris.or.kr

Francis, N.; Mark, P.C.; Patricia, W. Technological Performance Assessments Based on Patents and Patent Citations. *IEEE Transaction on Engineering Management* **1984**, *31*, *4*, 172-183.

2. Seo, J.-N.; Kwon, O.J.; Noh, K.-R; Kim, W.-J.; Jeong, E.-S. A Study on the research outcome measurement and application using the patent citation information. *Proceedings of the Korea Technology Innovation Society Conference* **2006**, 397-409.

50.

How network tie moderates the relationships between entrepreneurial alertness and innovativeness?: Perspective from open innovation

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Expanded abstract

In modern times, it is a very important era to discover and create opportunities to generate profits in the marketplace.

In particular, social ventures that pursue social values in existing ventures are in a more restrictive environment in terms of resource utilization and opportunity creation compared to existing companies or ventures.

kirzner (1999) compared it as "a sense of what might be ''around the corner,'' i.e., the sense to notice that which has hitherto not been suspected of existing at all.

Alertness is an entrepreneurial action necessary in all processes leading to success in creative innovation by setting a company's future direction and using new technologies to meet new demands. Entrepreneurship with high alertness discover opportunities, connect and combine different things, evaluate and judge what is better for the world, and constantly try to create new things and change the world. This is entrepreneurial alertness.

Social networks bring the transfer of knowledge, resources, markets or skills to the organization. Networks provide an opportunity to acquire maximum information in a limited environment. You will be able to explore and combine this information to create new information to discover opportunities.

In order to discover opportunities in a limited environment and pursue innovation with social

value, social ventures must have entrepreneurial alertness to create opportunities by agilely combining information acquired from social networks to create new information.

Through this, we seek to find implications that will lead to the discovery of business opportunities and the creation of innovation for social ventures in the modern limited environment.

In addition, from the perspective of open innovation, Entrepreneurs acquire information and seek opportunities through the formation of various networks. In particular, Mark Granovetter (1973) argues that weak ties play an important role in the acquisition of information.

We want to confirm that entrepreneurs with alertness who maintain ties through networks even in a limited environment create more innovation results.

51.

Efficiency Analysis for Innovative e-Government ICT Operations Management: Non-parametric Frontier Approach

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Abstract

Purpose/ Research Question: ICT (Information and Communication Technologies) plays an important role in promoting the spread of technology throughout society, affecting the field of economic activity in various ways and improving productivity (Bosworth and Triplett, 2007; Kretschmer, 2012). Jorgenson and Stiroh (2000) & Oliner and Sichel (2000) highlighted that technological progress and innovation in ICT increase productivity and create added value, leading to faster economic growth; it has been empirically proven to have a positive effect (Barua et al., 1995; Dewan and Kaemer, 2000). Fukugawa (2006) suggested that the ICT environment should be preceded in creating economic added value, and Kelly (1994) emphasized the importance of information technology development by proving that competitiveness and productivity would increase by the development of information technology.

The added value of the ICT industry announced by the OECD has been growing rapidly in related industry and the importance of ICT industry and ripple effect will be a significant factor in evaluating countries in the fourth industry. On basis of the development of ICT, several countries are contributing a lot to the development of ICT through collaboration according to the rapidly

developing environment of the information generation and International organizations also continue to discuss progress in informatization to understand the degree of informatization by country. Such international relations influence the competency, development, and productivity emphasized by Patra and Krishna (2015) researchers and continuous discussion is important in terms of strengthening competitive advantage through knowledge networks.

In order to improve the quality of discussion, cooperation and informatization between countries, ITU (International Telecommunication Union) international organizations have been publishing the ICT Development Index every year for member countries. The ICT Development Index is suitable to understand the level and status of information such as ICT environment, technology, and accessibility of countries. It is easy to find out the level of national informatization using a complex index of how much each country's ICT accessibility and technology is used and how much it has influence and reflect it in a country's ICT policy. At the point of highlighting economic performance with the development of ICT technology, research on the impact of ICT on various industrial fields has been steadily progressed.

However, studies on the ICT approach to be used in this study and efficiency studies on the ICT use with technology are insufficient. Since economic performance is highlighted by the development of ICT technology, it is required to examine whether the degree of use of ICT is being operated efficiently, which is the direct efficiency of the technology and access environment with ICT research investment. This problem Prasanna et al. (2019) solves the problem of delayed growth of a given production factor and suggests the need to review marginal products; the more ICT use is efficient; the more ICT influence is enhanced. If the degree of ICT use is inefficiently operated in an environment of successful ICT investment, it is required to re-establish efficient operation inspection and improvement measures for the efficiency of ICT use in order to derive efficient productivity.

Therefore, the level of efficient use must be changed by measuring the relative efficiency between countries and comparing the efficiency of output comparing to input. Inefficient countries tend to seek potentially operational options that can be improved through benchmarking. In addition, they look up the relationship of the influence of external environmental factors on the efficiency of ICT use. Government managers who establish ICT policies has a duty to promote strategies for continuous growth and increasing national competitiveness considering the current status.

Unlike precedent research which measured economic performance and drew conclusion of external environment factor, this study used data-base approach in order to understand ICT use efficiency by each country and measure calculation factors for input.

This thesis is organized as follows. Section 2 reviews the theoretical background related to ICT and DEA (Data Envelope Analysis). Section 3 describes the research data and methodology. Section 4 describes the analysis composition. Section 5 explains the policy implications of the analysis results.

Key Literature Reviews (About 3~5 papers): In general, technical efficiency and productivity are

measured through DEA developed by Charnes et al. (1978) or through statistical analysis. Sutopo et al. (2019) is a useful method of evaluating and explaining the effect on performance, and meaningful to provide a level of efficiency by modeling a production frontier. Paganetto et al. (2003) researched on investment, productivity and efficiency of ICT and Lee et al. (2018) conducted an efficiency analysis to obtain an objective basis for investment in R&D. This suggested that decision makers provide clear justification and speed for policy decisions to easily resolve conflicts in the process making of policy implementation and emphasized the need to consider new industry possibilities or economic effects. Aristovnik (2012) measured the effects of ICT on educational performance in EU and OECD countries to derive its importance and suggested inefficient organizations and potential improvement level by measuring Royalty System efficiency in order to assert the R&D environment of a new approach from the perspective of Hwang et al. (2018) open innovation. Scholochow et al. (2010) verified the commercialization strategy and efficiency goals through a three stage DEA approach for the effect and efficiency of ICT in hotels. Milana and Zeli (2002) said that existing prior research is meaningful since it is required to consider the study of ICT efficiency level on productivity and the efficiency apart from the existing top-down approach and expert opinions considering the ICT effect on regional economy efficiency developed by Susiluoto (2003).

Design/ Methodology/ Approach: It is worthy to examine how efficiently the technology and access environment developed by ICT investment research is being operated through relative comparison with the countries. For relative comparison, each country should have an objective basis for the efficiency of use comparing to ICT technology and accessibility. It is to see how efficiently the inputs have been operated and yielded results which are required for production in the countries. Therefore, the ICT Development Index published by the ITU International Organization in this study suggests measurable data acquisition for efficiency using readiness, capabilities, and use of ICT considering national informatization strategy.

We selected the collection of data to be used for analysis based on the 2019 data of the ICT Development Index issued on the countries registered as members of the ITU International Organization. We collected input variables and output variables that were applied with the same standard of indicators developed by ITU international organizations. We selected 37 countries as DMU (Decision Making Unit), excluding countries with missing values in the indicator. We measured ICT Readiness (infrastructure, access) and ICT Capability (skills) as input variables, and ICT Use (intensity) as an output variable based on the selected countries.

After the DEA analysis, we compared the relative efficiencies of each country and derived the points and potential improvement in order to increase the efficiency of inefficient countries. In addition, we conducted environmental factor analysis using the external influence factor as an independent variable and reflecting the efficiency value, which is a dependent variable.

Methodology from the perspective of investing in the country's ICT technology and access environment. DEA offers relative efficiency. It has the following advantages in measuring efficiency.

1. efficient production possibility frontier or efficiency frontier can be derived using various numerical values as a non-parametric statistical technique that simultaneously considers input and output and it has no need to assume a production function.
2. A few input and output factors can be considered, favorable weights to decision-making units without subjective weighting can be assigned, and efficiency can be analyzed by objectivity.
3. Decision Making Unit can be compared to other DMUs and its efficiency can be measured. An inefficient DMU presents potential improvement for efficient operation.

(Expected) Findings/Results:

1. Selecting efficient and inefficient countries by measuring the relative efficiency of each country
2. Inefficient countries should identify the causes of inefficiency factors according to profits of scale
3. Exploring the ICT environment of benchmarking countries that is being operated efficiently at the potential level of improvement by measuring potential improvements according to profits of scale.
4. Deriving regression factors by selecting external influence factors that affect ICT use efficiency

Research limitations/ Implications:

Considering that ICT promotes the spread of technology throughout society and affects economic activities from various angles, we used data envelope analysis method to improve ICT use efficiency for the study. We used DEA method in order to analyze how efficiently the technology and accessibility used with ICT investments in each country by collecting data from the ICT Development Index published by the ITU international organization. Based on the results, it is to become an efficient country by considering the level of potential improvement for countries lacking use efficiency.

As a result, the implications of this study can be summarized as follows. The use of ICT is very important in ICT-competitive countries in terms of outcomes. It is effective in modelling producible frontiers and providing efficiency level to solve the problem of growth delay of the production factors and derive methods of increasing marginal products. It is significant to understand the level through relative comparison with external environmental factors to effectively improve the use of ICT. The content of the efficiency analysis can be used as an important reference material for ICT policy managers in a country's government.

In the follow-up study, it is expected that ICT technology classification of various countries to be determined by DMU and various input & output factors are considered.

Keywords: e-Government, Informatization, Efficiency Strategy, User-centric ICT Innovation

Reference

[1] Aristovnik, A. (2012). The relative efficiency of education and R&D expenditures in the new EU member states. *Journal of Business Economics and Management*, *13*(5), 832-848.

[2] Barua, A., Kriebel, C. H., & Mukhopadhyay, T. (1995). Information technologies and business value: An analytic and empirical investigation. *Information Systems Research*, *6*(1), 3-23.

[3] Bosworth, B. P., & Triplett, J. E. (2007). The early 21st century US productivity expansion is still in services. *International Productivity Monitor*, *14*(1), 3.

[4] Chao, G. T., O'Leary-Kelly, A. M., Wolf, S., Klein, H. J., & Gardner, P. D. (1994). Organizational socialization: its content and consequences. *Journal of Applied Psychology*, *79*(5), 730.

[5] Charnes, A., Cooper, W. W., & Rhodes, E. (1978). Measuring the efficiency of decision-making units. *European Journal of Operational Research*, *2*(6), 429-444.

[6] Fukugawa, N. (2006). Science parks in japan and their value-added contributions to new technology-based firms. *International Journal of Industrial Organization*, *24*(2), 381-400.

[7] Hwang, B. Y., Jun, H. J., Chang, M. H., & Kim, D. C. (2018). Efficiency analysis of the royalty system from the perspective of open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, *4*(3), 22.

[8] Jorgenson, D. W., & Stiroh, K. J. (2000). Us economic growth at the industry level. *American Economic Review*, *90*(2), 161-167.

[9] Kretschmer, T. (2012). Information and communication technologies and productivity growth: a survey of the literature. *OECD Digital Economy Paper, 2012*(195), 20.

[10] Lee, B., Sohn, E., Won, D., Yeo, W., Kim, K., & Kim, S. (2018). The efficiency analysis of national R&D planning for the field of precision medicine in Korea. *Journal of Open Innovation: Technology, Market, and Complexity*, *4*(3), 39.

[11] Milana, C., & Zeli, A. (2002). The contribution of ICT to production efficiency in Italy: firm-level evidence using data envelopment analysis and econometric estimations. *OECD Science Technology and Industry Working Papers, 2002(*13), 61.

[12] Oliner, S. D., & Sichel, D. E. (2000). The resurgence of growth in the late 1990s: is information technology the story. *Journal of Economic Perspectives*, *14*(4), 3-22.

[13] Patra, S. K., & Krishna, V. V. (2015). Globalization of R&D and open innovation: linkages of foreign R&D centers in India. *Journal of Open Innovation: Technology, Market, and Complexity*, *1*(1), 7.

[14] Prasanna, R. P. I. R., Jayasundara, J. M. S. B., NaraddaGamage, S. K., Ekanayake, E. M. S.,

Rajapakshe, P. S. K., & Abeyrathne, G. A. K. N. J. (2019). Sustainability of SMEs in the competition: a systemic review on technological challenges and SME performance. *Journal of Open Innovation: Technology, Market, and Complexity*, *5*(4), 100.

[15] Scholochow, C., Fuchs, M., & Höpken, W. (2010). ICT efficiency and effectiveness in the hotel sector—a three-stage DEA approach. *Information and Communication Technologies in Tourism 2010*(1), 13-24.

[16] St Dewan, S., & Kraemer, K. L. (2000). Information technology and productivity: evidence from country-level data. *Management Science*, *46*(4), 548-562.

[17] Susiluoto, I. (2003). Effects of ICT on regional economic efficiency. *Helsinki City Urban Facts Office Web Publications*, 2003(16), 39.

[18] Sutopo, W., Astuti, R. W., & Suryandari, R. T. (2019). Accelerating a technology commercialization; with a discussion on the relation between technology transfer efficiency and open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, *5*(4), 95.

52.

Exploring the Food Firm's Open Innovation Strategies.

-Focusing on Korean Food Industry

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Abstract

Purpose/ Research Question:

Climate change [1] and diversity in consumer tendencies promote food firm's innovation. However, small and medium-sized enterprises (SMEs) lack capital, resources, and capabilities compared to large companies, making it difficult to innovate alone. Many SMEs need innovative cooperation. Particularly in latecomer countries, cooperation is becoming more and more important for SME innovation [2]. In the food industry, innovative cooperation of SMEs is being carried out in various ways. Nevertheless, most of the existing studies have been conducted in advanced countries [3], and empirical studies on the innovation performance of the food industry are insufficient [4]. There is a need for empirical research related to innovation performance in SMEs in the latecomer countries. This study investigated the impact of government support, R&D investment, and cooperation with other firms or universities on innovation performance in latecomer countries such as Korea.

Key Literature Reviews:

Hong et al. [5] studied the effect of government subsidies on innovation efficiency using panel data from China's high-tech industry. Government subsidies have been shown to have a negative effect on the innovation efficiency of high-tech industries. However, it was confirmed that private R&D funds had a positive effect.

Buchmann and Kaiser [6] evaluated the effectiveness of subsidies for individual and collaborative research in the German biotechnology industry. They found that subsidies increased innovative performance with additional benefits by participating in more than one

project. It is a higher level of centrality in the firm's network that greatly increases R&D success.

Protogerou, Caloghirou, and Vonortas [7] explore the impact of various firm's resources and capabilities on firm's innovative performance. This study revealed that the founder's human resource factors such as prior exposure to R&D, team functional diversity and educational background, and external firm's characteristics such as technical cooperation and networking with universities are important.

Yun et al. [8] analyzed the open innovation of small restaurants through case studies on restaurants. The results revealed that open innovation is essential to the success of small restaurants. And they found that an open innovation platform for food ingredients, recipes or services can generate additional revenue by selling independent ingredients or services.

Rostoka, Locovs, and Gaile-Sarkane [9] studied an effective model for cooperation between universities and private construction firms. Previous research suggests that human resource management is important. New models and new approaches for workforce selection must be created to promote motivation and maintenance within the industry. It should also improve the education level of future professionals and work together with industry and educational institutions.

Design/ Methodology/ Approach:

This study examines impact of the government support, R&D investment, and cooperation with other companies or universities, directly or indirectly, on firm's innovation performance. A structural equation model (SEM) is used for the study. The SEM is suitable to verify the causal relationship and significance between variables. This study created a database by directly collecting management indicators, patent performance, and cooperation data for 10 years for food SMEs with a dedicated research and development (R&D) organization in Korea.

(Expected) Findings/Results:

The government support for SMEs had a direct positive effect on the cooperation with universities and innovation performance. However, it did not affect R&D investment and alliances with other firms. R&D investments have had a positive impact on our alliances with universities and our innovation performance, but not our alliances with other firms. In addition, alliances with universities and other firms each had a positive impact on innovation performance.

Research limitations/ Implications:

This study has the following limitations. First, this study is only for SMEs. Therefore, it is insufficient to grasp the performance of large firms leading the food industry in the latecomer countries to cover the entire food industry. In Korea, more than 55% of total sales in the food and beverage industry are less than 3% of large firms, so research on SMEs is limited. Second, in terms of innovation, only patent results were considered, not new product development results. Unlike other high-tech industries, in the food sector, patents do not guarantee market monopoly. Third, the relationship between innovation and financial performance has not been confirmed. It is not known how innovation performance will affect a company's profitability. To overcome these limitations, future research should include large companies in the scope of the study, measure new product development performance as innovation performance, and identify the relationship between innovation and financial performance.

Keywords:

food SME; food industry; government support; innovation performance; latecomer country

Reference

1. Parry, M.L.; Rosenzweig, C.; Iglesias, A.; Livermore, M.; Fischer, G. Effects of Climate Change on Global Food Production Under SRES Emissions and Socio-Economic Scenarios. Global Environ. Change 2004, *14*, 53-67.
2. Kaminski, P.C.; de Oliveira, A.C.; Lopes, T.M. Knowledge Transfer in Product Development Processes: A Case Study in Small and Medium Enterprises (SMEs) of the Metal-Mechanic Sector from Sao Paulo, Brazil. Technovation 2008, *28*, 29-36.
3. Cheng, C.C.; Shiu, E.C. Establishing a Typology of Open Innovation Strategies and their Differential Impacts on Innovation Success in an Asia-Pacific Developed Economy. Asia Pacific Journal of Management 2019, 1-25.
4. Acosta, M.; Coronado, D.; Ferrándiz, E. Trends in the acquisition of external knowledge for innovation in the food industry. In *Open Innovation in the Food and Beverage Industry*.; Anonymous .; Elsevier, 2013, pp. 3-24.
5. Hong, J.; Feng, B.; Wu, Y.; Wang, L. Do Government Grants Promote Innovation Efficiency in China's High-Tech Industries? Technovation 2016, *57*, 4-13.
6. Buchmann, T.; Kaiser, M. The Effects of R&D Subsidies and Network Embeddedness on R&D Output: Evidence from the German Biotech Industry. Industry and Innovation 2019,

26, 269-294.

7. Protogerou, A.; Caloghirou, Y.; Vonortas, N.S. Determinants of Young Firms' Innovative Performance: Empirical Evidence from Europe. Research Policy 2017, *46*, 1312-1326.

8. Yun, J. J., Zhao, X., Jung, K., & Yigitcanlar, T. (2020). The culture for open innovation dynamics.

9. Rostoka, Z., Locovs, J., & Gaile-Sarkane, E. (2019). Open innovation of new emerging small economies based on university-construction industry cooperation. *Journal of Open Innovation: Technology, Market, and Complexity*, *5*(1), 10.

53.

Effect of knowledge based and policy-based firm strategies on globalization : Focused on South Korea Start-ups

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Abstract

This study aimed to identify the effects of corporate strategy methods for globalization on the performances of companies from both knowledge and policy perspectives.

Many start-up technologies fail in overcoming the Death Valley curve and, as a result, go out of business or face economic difficulties.
This study will explain the methods for leading a sustainable company through globalization strategies.

In addition, the study will investigate the effects of having a knowledge or policy perspective and establishing globalization strategies from the beginning of a business using a survey of 70 people from the start-up industry.

The results were analyzed by using the Smart PLS program.

The analysis in this study will identify the effects of each factor and investigate the effects of companies' globalization strategies on their performance.

Keywords: Knowledge Management, Performances of Start-up Companies, Globalization of Start-up Companies, Globalization based on a Knowledge Perspective

Purpose/ Research Question

Applying policy perspectives will positively affect the globalization factors of Korean start-up companies.

Preparing for globalization from the beginning of the business will positively affect company performance.

Key Literature Reviews

The structural equation model is a study model that integrates factor analysis and structural path analysis.[1]

In addition, structural equation modeling is a statistics method commonly used for studies on business, research strategies, and society. [2] In particular, distribution-based SEM is a common method for calculating the model mediating variable by

using a proxy. Many scholars have developed their studies by using the SEM distribution method. [3] PLS-SEM analysis consists of two models, including external model (calculation model) evaluation and internal model (structural model) evaluation.[4] The calculation model first starts with the evaluation analysis. This results in the variables. T the variables are considered reliable when their values are greater than 0.7 and their distributions are over 50%

The second step is to identify the reliability of the internal consistency, which uses the Cronbach's alpha value. Greater values show greater reliability

In addition, internal consistency is considered reliable when the convergent validity of the structure has a reliability of 0.7 or greater. The convergent validity is the average distribution deduced from all structures. It is significant if the value is 0.5 structurally

Policy-based Perspective Structure

One of the factors that affect decision-making on corporate strategies is using policies well.

Currently, many companies use policy perspectives to establish corporate strategies.

In short, when conducting corporate business or establishing corporate strategies, the policy perspective is extremely important to understanding the company's system, which is considered greatly related to the success factors of the company.

According to Porter's Diamond Model, there are clear differences among developed countries and developing countries, and corporate strategies should match the systems of each.

In addition, when entering the market of a developed country, it is especially important to understand the policies and legislation and to make strategic decisions by using them.

Design/ Methodology/ Approach

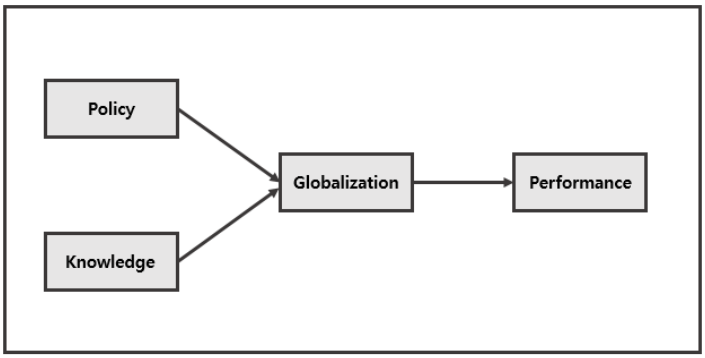

Figure 1. Research Model

Figure 1 is the research model for this study. Policy perspective is the independent variable, and knowledge perspective is another independent variable. The degree of globalization from company performance was selected as the mediating variable. The factors related to company performance were selected as the dependent variables.

(Expected) Findings/Results

Table 5

Structural Model Testing

Structural Paths	Standardized Path Coefficients	P value
Path Ⅰ. Policy → Globalization	0.849*	0.835
Path Ⅱ Knowledge → Globalization	0.734*	0.000
Path Ⅲ Globalization → Performance	0.324*	0.046

Source: The author.

Notes: *Significant at p<0.001 (two-tailed)

This study identified the effects of globalization preparation from the early stages of a business on company performance.

In terms of direct correlations, globalization from a knowledge perspective has a standardized path coefficients value of 0.734, and the effects of globalization on companies has a standardized path coefficients value of 0.324.

The P values of significant correlations show that the P values of Path Ⅰ is 0.832, Path Ⅱ is 0, and Path Ⅲ is 0.046.

As shown from the values in the tables above, globalization based on a knowledge perspective has positive effects on start-up companies.

Through this study, it was possible to predict how companies should make decisions during the early stages or set up at the start of the business.

Start-up companies lack the assets and staff needed for globalization in their early stages.

Research limitations

This study confirmed that preparing for globalization with a knowledge-based perspective has a positive relationship with company performance.

However, it was also confirmed that preparing for globalization with a policy-based perspective has a negative relationship with company performance. As a result, preparation for globalization from the start of a business can depend on how you approach the company's performance.

There are some limitations to this study as well.

This study only evaluated start-up companies in Korea. Therefore, it was impossible to find information on the globalization of foreign start-up companies.

If given the opportunity, the authors would like to study the globalization of start-up companies from the US and developing countries in future studies.

Keywords: At least more than three keywords are kindly requested.

Reference

1. Cheung, Mike W-L. "A Model for Integrating Fixed-, Random-, and Mixed-Effects Meta-Analyses into Structural Equation Modeling." Psychological methods 13, no. 3 (2008): 182.

2. Raftery, Adrian E. "Bayesian Model Selection in Structural Equation Models." Sage Focus Editions 154 (1993): 163-63.

3. McDonald, Roderick P, and Moon-Ho Ringo Ho. "Principles and Practice in Reporting Structural Equation Analyses." Psychological methods 7, no. 1 (2002): 64.

4. Henseler, Jörg, Geoffrey Hubona, and Pauline Ash Ray. "Using Pls Path Modeling in New Technology Research: Updated Guidelines." Industrial management & data systems 116, no. 1 (2016): 2-20.

54.

The Influence of Entrepreneurship and Career Choice : The Mediation Effect of Bricolage

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Abstract

Purpose/ Research Question:
This study was conducted to provide suggestions on the importance of entrepreneurship and Bricolage by empirical analysis of the impact of entrepreneurship on career decisions in college students.

Key Literature Reviews (About 3~5 papers):
Unemployment is rising through global Pandemic and mid- to long-term recession caused by COVID19. Unstable employment leads to social unrest. To overcome current job insecurity, it is important to enhance the competitiveness of the domestic economy (Yang, 1997). In order to solve these problems, it is suggested that young people need entrepreneurship that can enhance their spirit of challenge, creativity and innovation. However, even with their own human resources and technical resources, they often fail to find opportunities and utilize resources and opportunities. This is a waste of resources and could also result in a further contraction of the domestic job market.
Entrepreneurship is described as a key driver of national competitiveness (World Economic Forum, 2010). Entrepreneurship is described as a means of addressing current social problems, such as economic growth, building a sustainable economy, creating jobs and improving the quality of life through the transformation of a new economic system (World Economic Forum, 2009; 2010). Entrepreneurship is a necessary concept for all stakeholders, including the general public, youth and youth, as well as experts (Lee Chae-won, Kang Kyung-kyun, 2016).

Entrepreneurship can have a great effect on employment in terms of the quantity and quality of

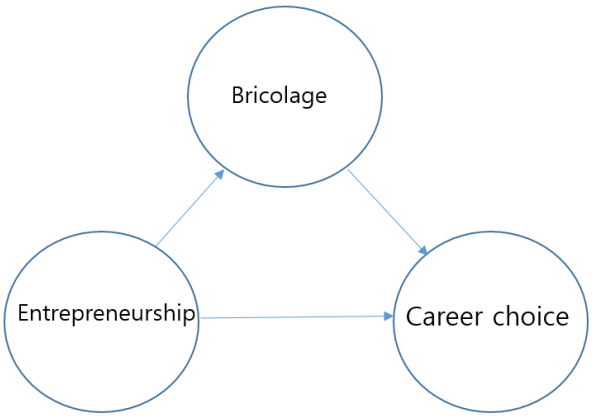
jobs (Hwang & Jeon, 2010). Universities are striving to increase the employment rate of young people by fostering entrepreneurship by opening courses for start-ups and courses for employment (Kim Sung-woo and Kang Min-hyung, 2019).

Entrepreneurship is closely related to employment issues. Innovative entrepreneurs who are highly responsive to economic uncertainties and seize opportunities will lead economic growth and job creation. Entrepreneurs like this form human capital and increase the effectiveness of education through entrepreneurship education. Start-ups can have an employment effect even if the job effect is small (Audretsch, 1995). This is because entrepreneurship emphasizes innovation and strengthens entrepreneurial activities that directly contribute to job creation in order to survive through the large-scale market in newly created small businesses. This is because new jobs are highly effective in creating jobs when new start-ups move toward higher growth (Hwang Joon-wook, Jun Byung-yu, 2010).

This is a weakening of the youth labor market among the domestic labor market. As youth unemployment has become a serious social problem, the need to create employment through start-ups is being highlighted. The government is making steady efforts to promote entrepreneurship and boost start-ups. In order to boost entrepreneurship and create value-added innovative start-ups, the social environment is created in a friendly way to try and operate startups and young people are interested in fostering entrepreneurship that fosters challenging spirit and creativity (Ahn Sun-young, Kim Hee-jin, Kim Tae-hyung, 2011).

In this study, we would like to clarify the impact relationship between entrepreneurship, Bricolage and career choice for undergraduate students who have completed start-up education at university and present the importance and implications of entrepreneurship.

Conceptual Development to the Hypothetical Model:



H1: Entrepreneurship will have a positive effect on career choice.
H1-1: Entrepreneurship will have a positive effect on career choice (intention to start a business).
H1-2: Entrepreneurship will have a positive effect on career choice (intention to employment).

H2: Entrepreneurship will have a positive effect on Bricolage.

H3: Bricolage will have a positive effect on career choice.

H1-1: Bricolage will have a positive effect on career choice (intention to start a business).

H1-2: Bricolage will have a positive effect on career choice (intention to employment).

(Expected) Findings/Results:
Based on the expected findings, we would like to make the following implications.
First, since it is centered on the startup strategy of the early start-up in the prior research start-up on Bricolage, the difference was applied as an influencing variable by applying the research model through career selection from the perspective of entrepreneurship. Previous prior studies have been conducted on the impact of entrepreneurship on career choices, but new variables, Bricolage, have been applied as different types of variables.

Second, research using Bricolage as a variable is extremely rare in Korea as well. When the term "Bricolage" is translated into Korean, it should have the meaning of its essence, and it is expected that if various studies of entrepreneurship and "Bricolage" are conducted in the future, it will help students in choosing jobs.

Third, entrepreneurship and Bricolage will not create inventors, but develop into education to develop adaptability to overcome the difficulties and adversity that will come by utilizing their own opportunities and resources.

Despite the results and implications of this study, there are limitations, which can provide directions for future research. First, it is conducted on university students of A University in Seoul and has limitations in generalizing the research results. Subsequent studies will require demonstration of Bricolagy's influence in other departments and across the country. Second, the lack of prior research by Bricolage may lead to difficulties in drawing up hypotheses. Subsequent studies will have more valuable research results if a variety of research methods, including not only college students but also the general public, are used to use the leading variables of Bricolage.

Keywords: Entrepreneurship, Bricolage, Career choice.

Reference

Baker, T.; Miner, A.S.; Eesley, D.T. Improvising firms: Bricolage, account giving and improvisational competencies in the founding process. *Research policy* **2003**, *32(2)*, 255-276. https://doi.org/10.1016/S0048-7333(02)00099-9

Baker, T.; Nelson, R.E. Creating something from nothing: Resource construction through entrepreneurial bricolage. *Administrative science quarterly* **2005**, *50(3)*, 329-366. https://doi.org/10.2189/asqu.2005.50.3.329

Kim, D.; Lee, D. Impacts of Metacognition on Innovative Behaviors: Focus on the Mediating Effects of Entrepreneurship. *J. Open Innov. Technol. Mark. Complex.* **2018**, *4*, 18. https://doi.org/10.3390/joitmc4020018

Carter, N.M.; Gartner, W.B.; Shaver, K.G.; Gatewood, E.J. The career reasons of nascent entrepreneurs. *Journal of Business Venturing* **2003**, *18*(1), 13-39. https://doi.org/10.1016/S0883-9026(02)00078-2

Choi, J.-I.; Markham, S. Creating a Corporate Entrepreneurial Ecosystem: The Case of Entrepreneurship Education in the RTP, USA. *J. Open Innov. Technol. Mark. Complex.* **2019**, *5*, 62. https://doi.org/10.3390/joitmc5030062

Crouch, D. bricolage, poetics, spacing. Humanities 2017, 6, 95. https://doi.org/10.3390/h6040095

Ferri, L.; Ginesti, G.; Spanò, R.; Zampella, A. Exploring the Entrepreneurial Intention of Female Students in Italy. *J. Open Innov. Technol. Mark. Complex.* **2018**, *4*, 27. https://doi.org/10.3390/joitmc4030027

Fisher, G. Effectuation, causation, and bricolage: A behavioral comparison of emerging theories in entrepreneurship research. *Entrepreneurship theory and practice* **2012**, *36(5)*, 1019-1051.https://doi.org/10.1111/j.1540-6520.2012.00537.x

Gibb, A. In pursuit of a new 'enterprise'and 'entrepreneurship'paradigm for learning: creative destruction, new values, new ways of doing things and new combinations of knowledge. *International journal of management reviews* **2002**, *4(3)*, 233-269. https://doi.org/10.1111/1468-2370.00086

Kannampuzha, M.J.; Suoranta, M. Bricolage in the marketing efforts of a social enterprise. *Journal of Research in Marketing and Entrepreneurship* **2016**. https://doi.org/10.1108/JRME-07-2015-0039

Kirkwood, J.; Dwyer, K.; Gray, B. Students' reflections on the value of an entrepreneurship education. *The International Journal of Management Education* **2014**, *12(3)*, 307-316. https://www.sciencedirect.com/science/article/pii/S1472811714000469

Kim, S.; Kang, M. Entrepreneurial· job Search education's effects on the antecedents of university students' entrepreneurial· job search intention. *Journal of Engineering Education Research* **2016**, *19*(4), 47-59.

Lackéus, M. Entrepreneurship in Education: What, why, when, how. *Paris: Background paper for OECD-LEED* **2015**.

Liñán, F. Intention-based models of entrepreneurship education. *Piccolla Impresa/Small Business* **2004**, *3*(1), 11-35.

Lin, J.; Nabergoj, A.S. A Resource-Based View of Entrepreneurial Creativity and Its Implications to Entrepreneurship Education. *Economic and Business Review* **2014**, *16*(2), 163-183.

Middleton, K.L.W. Becoming entrepreneurial: gaining legitimacy in the nascent phase. *International Journal of Entrepreneurial Behavior & Research* **2013**, *19*(4), 404-424. https://doi.org/10.1108/IJEBR-04-2012-0049

Oganisjana, K. Promotion of university students' collaborative skills in open innovation environment. *J. Open Innov. Technol. Mark. Complex.* **2015**, *1*, 18. https://doi.org/10.1186/s40852-015-0021-9

55.

Digital Entrepreneurship and Social Network Effects

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Abstract

Purpose/ Research Question:
New digital technologies have changed the ways of pursuing entrepreneurial opportunities and entrepreneurial processes. It is important to understand the differences between traditional and digital business as more companies are operating digital businesses(Hull, et al. 2007, Barykin, et al. 2020), but there is a significant gap in the conceptualization of entrepreneurship(Sussan & Acs, 2017). Understanding the integration of digital technology with entrepreneurship is becoming essential in practice and theoretical approaches. In this, there needs further elaboration on the role of digital entrepreneurship and the incorporation of digital technology-related theories and concepts into the existing theoretical perspectives and research streams in entrepreneurship (Jose et al. 2019, Nambisan, 2017).
This project will focus on the social network view in digital entrepreneurship by extending network theory to understand the social network impact on entrepreneurship in digitalization for its initial launch and scale-up (Srinivasan & Venkatraman, 2018).

Key Literature Reviews (About 3~5 papers):
As we all know that Digital entrepreneurship is highly topical in the modern era because advancement and improvements in technology develop numerous benefits for entrepreneurs(Chae & Goh, 2020). Society's great concern for emerging digital technologies opposes relatively little study on digital entrepreneurship opportunities, obstacles, and success factors (Kraus, et al., 2019). Entrepreneurship studies whether new business models and markets are introduced or replaced by previous digital networks systems supporting shared economy services. Uber, Airbnb, and Wikipedia are well-known examples listed in this context, carrying out practices that are fundamentally not unique but have been converted to digital environments and supported by the process of giving personal assets to other members in the digital world (Richter, et al., 2017).

(Expected) Findings/Results:

Social networks provide entrepreneurs (in different ways) with a wide variety of useful tools that are not already in their control and enable them to achieve their objectives (Passaro et al. 2020). The following are the important resources that social network provides: diverse, Non-diverse, sensible, and non- sensible, helps to access skills, knowledge, and finance.

It is often argued (Klyver, et al. 2008) that social capital is the value that social media networks create. Human capital is human knowledge and capacity; finance capital is money in the pockets of people and social capital is the quality of assets created by social networks of people. Furthermore, Social networks impact entrepreneurship significantly. It is a crucial component of an entrepreneur's social capital due to this quality generated among individuals that improve the value of the human capital of a person, for example, education and intelligence. In most of this research, network attributes such as the strength of relationships are assumed to decide the type of assets provided within the network. For example, weak relationships are relevant because they provide organizational knowledge to the entrepreneur and strong links provide access to other resources. Entrepreneurs use social media such as Facebook and Instagram to attract new customers or understand consumers' behavior(Lynn, et al. 2020). It will help generate a relationship between clients and customers which is an important factor affecting or considered to stand-up a new business (Jenssen & Koenig, 2002, Eremina, et al. 2019).

Keywords: Digital entrepreneurship, Social networks, entrepreneurial opportunity, digitalization.

Reference

Barykin, S.Y.; Kapustina, I.V.; Kirillova, T.V.; Yadykin, V.K.; Konnikov, Y.A. Economics of Digital Ecosystems. *J. Open Innov. Technol. Mark. Complex.* **2020**, *6*, 124. https://doi.org/10.3390/joitmc6040124

Chae, B.K.; Goh, G. Digital Entrepreneurs in Artificial Intelligence and Data Analytics: Who Are They? *J. Open Innov. Technol. Mark. Complex.* **2020**, *6*, 56. https://doi.org/10.3390/joitmc6030056

Eremina, Y.; Lace, N.; Bistrova, J. Digital Maturity and Corporate Performance: The Case of the Baltic States. *J. Open Innov. Technol. Mark. Complex.* **2019**, *5*, 54. https://doi.org/10.3390/joitmc5030054

Hull, C.E.K.; Hung, Y.T.C.; Hair, N.; Perotti, V.; DeMartino, R. Taking advantage of digital opportunities: a typology of digital entrepreneurship. *International Journal of Networking and Virtual Organisations* **2007**, *4(3)*, 290-303. https://doi.org/10.1504/IJNVO.2007.015166

Jenssen, J.I.; Koenig, H.F. The effect of social networks on resource access and business start-ups. *European Planning Studies* **2002**, *10(8)*, 1039-1046. https://doi.org/10.1080/0965431022000031301

Klyver, K., Hindle, K., & Meyer, D. (2008). Influence of social network structure on entrepreneurship participation--A study of 20 national cultures. *International Entrepreneurship and Management Journal*, 4(3), 331-347. https://doi.org/10.1007/s11365-007-0053-0

Kraus, S., Palmer, C., Kailer, N., Kallinger, F. L., & Spitzer, J. (2018). Digital entrepreneurship: a research agenda on new business models for the twenty-first century. *International Journal of Entrepreneurial Behavior & Research.* **2018**. https://doi.org/10.1108/IJEBR-06-2018-0425

Lynn, T.; Rosati, P.; Nair, B.; Mac an Bhaird, C. An Exploratory Data Analysis of the #Crowdfunding Network on Twitter. *J. Open Innov. Technol. Mark. Complex.* **2020**, *6*, 80. https://doi.org/10.3390/joitmc6030080

Nambisan, S. Digital entrepreneurship: Toward a digital technology perspective of entrepreneurship. *Entrepreneurship Theory and Practice* **2017**, *41(6)*, 1029-1055. https://doi.org/10.1111/etap.12254

Passaro, R.; Quinto, I.; Rippa, P.; Thomas, A. Evolution of Collaborative Networks Supporting Startup Sustainability: Evidences from Digital Firms. *Sustainability* **2020**, *12*, 9437. https://doi.org/10.3390/su12229437

Richter, C.; Kraus, S.; Brem, A.; Durst, S.; Giselbrecht, C. Digital entrepreneurship: Innovative business models for the sharing economy. *Creativity and Innovation Management* **2017**, *26(3)*, 300-310. https://doi.org/10.1111/caim.12227

Saura, J.R.; Debasa, F.; Reyes-Menendez, A. Does User Generated Content Characterize Millennials' Generation Behavior? Discussing the Relation between SNS and Open Innovation. *J. Open Innov. Technol. Mark. Complex.* **2019**, *5*, 96. https://doi.org/10.3390/joitmc5040096

Srinivasan, A.; Venkatraman V. Entreprenurship in digital platforms: A network-centric view, *Strategic Entrepreneurship Journal* **2018**, *12(1)*. 54-71. https://doi.org/10.1002/sej.1272

Sussan, F.,; Acs, Z. J. The digital entrepreneurial ecosystem. *Small Business Economics* **2017**, *49(1)*, 55-73. https://doi.org/10.1007/s11187-017-9867-5

56.

Conservation of wetlands in the suburb of Seoul metropolitan as 'city of wetlands'

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Abstract

Purpose/ Research Question: Various species inhabit a narrow area of wetland ecosystem. In this study, we will conduct a quantitative study on the natural resources of wetlands in downtown Seoul. A comprehensive analysis of a total of five (Godeok-dong Wetland, Amsa-dong Wetland, Yeouido Saetgang Wetland, Tancheon Wetland, and Han River Bamseom Wetland) aims to present ways to preserve and manage natural resources. The results are to present the use of items in basic data on the certification standard for the Wetland City Accreditation of the Ramsar Convention (COP-14 participation in 2021) and promote the conservation of wetlands by evaluating the economic value of individual wetlands.

Design/ Methodology/ Approach:

- Evaluate the value of wetlands in the city center by fixing carbon dioxide and habitat, and select wetland conservation areas from among the ecological landscape conservation areas designated in Seoul to evaluate the ecological value thereof.
- To estimate the fixed amount of carbon dioxide for wetlands using the concept of ecosystem services, and to evaluate the ecological value of each wetland conservation area. We also want to estimate ecological value through carbon fixed amount estimation and habitat evaluation, which is an index of biodiversity value

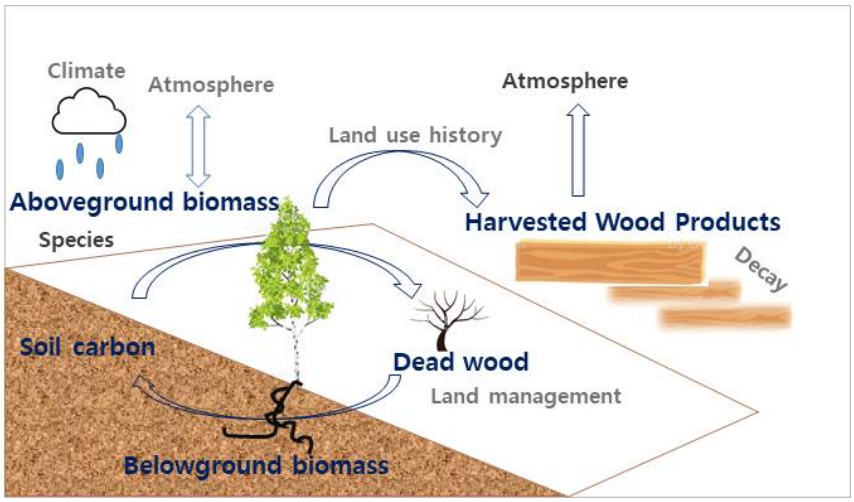

Figure 1. InVEST Carbon model Process

(Expected) Findings/Results:

- Evaluate two models of InVEST model, a methodology for evaluating the value of ecosystem services in this task:
- We would like to apply this model to quantitatively evaluate the value of carbon fixation held by wetlands through the InVEST Carbon model. This model is able to evaluate the value through the derived carbon fixed amount value, which further derives the value of wetlands.
- The InVEST Habitat Quality model is used as an indicator of biodiversity. Comparable for wetlands in a number of selected study areas

⇦ We are currently trying to estimate the value of wetlands used for preservation by evaluating the ecological value of wetland conservation areas in Seoul, and establishing the basic Ramsar Wetland Urban Certification System evaluation techniques.

⇦ Market value assessment of wetlands through carbon fixed volume estimation and biodiversity indicators of wetlands based on habitat condition evaluation results

Keywords: EIA process, Algorithm, public hearing, Strategic Environment Assessment

References

• Sharp R, Tallis HT, Ricketts T, Guerry AD, Wood SA, Chaplin-Kramer R, Vigerstol K. 2014. InVEST user's guide. The Natural Capital Project, Stanford.

• Terrado M, Sabater S, Chaplin-Kramer B, Mandle L, Ziv G. Acuña V. 2016. Model development for the assessment of terrestrial and aquatic habitat quality in conservation planning. Science of the total environment. 540: 63-70.

• Vigerstol K, Aukema J. 2011. A comparison of tools for modeling freshwater ecosyetem services. J. environmental management. 92(10): 2403-240.
• Choi, J. and S.D. Lee*. 2019. Application of habitat evaluation procedure with quantifying the eco-corridor in the process of environmental impact assessment. Int. J. Environ. Res. Public Health 2019, 16, 1437;
• Lee, SD. and SS Kwon. 2018. Carbon sequestration in the urban areas of Seoul with climate change: Implication for open innovation in environmental industry. Journal of Open Innovation: Technology, Market and Complexity. 4:48