Information and Communication Technologies and Social Innovation: A Structured Literature Review

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Abstract: Every company must try to innovate to survive in the global competition. Company can initiate business innovation that is socially oriented or often called as social innovation. Social innovation arises when technology innovation benefits the social community. Many authors identify Information and Communication Technologies (ICT) as one of the drivers for social innovations. The purpose of this study is to define social innovation and identify the type of ICT that most frequently drive social innovation. A structured literature review was conducted to achieve the objective. Literatures are obtained from two online databases namely Science Direct and Emerald Insight. The searching process results are 45 papers on Science Direct and 17 papers on Emerald Insight. After conducting exclusion inclusion mechanism, 16 papers are used for further analysis. From these literatures, definition of social innovation is determined. It was also found that mobile application is the most often used ICT in driving social innovation. The result is expected to provide a reference in conducting future research on social innovation.

1 INTRODUCTION

Companies in the business today must innovate to survive the increasingly fierce business competition. The company can start to do business innovation that is socially oriented or often called as social innovation. More and more business people are trying to understand their business models that are helped by Social Innovation (Davies, 2014). Social innovation is viewed as stemming from a new combination of ideas that had previously been separate. Social innovations are achieved through reconfiguration of collective, intentional and goaloriented actions of social entrepreneurs (Cui et al., 2017). Social innovation refers to the results expected from the technology innovation for the social community benefits (Mulgan, 2010). Despite several publications mentioning social innovation, the definition of social innovation is still ambiguous. This prevent the development of generalizable knowledge of Social innovation (Van der Have and Rubalcaba, 2016).

Recent development of Information and Communication Technologies (ICT) helps accelerate the social innovation (Cui et al., 2017). Nowadays, ICT is needed to help in managing the environment and reduce the poverty level in a country by supporting marginalised people with appropriate access to information, education, health, as well as financial services (Ashraf and Malik, 2011); (Cecchini and Scott, 2003) (Thatchenkery et al., 2004). There must be actors such as local government who repairs the condition so that the local businesses prosper. But in the social innovation with ICT, there are individuals motivated by the spiritual religion, guilty feeling, affection and etc., to develop their communities (Sandeep and Ravishankar, 2015). These individuals can be described as social entrepreneurs. They play important roles in creating condition and managing the process that allows the local businesses to develop and help the area out of poverty. Therefore, it is important to investigate the mechanisms underlying ICT that enable social innovation. So, social entrepreneurs get profits for the company and at the same time for the social environment.

According to the expert, ICT persistently creating new types of markets that enabled new patterns of industry dynamics (Lee et al., 2015). (Yunus, 1998) predicts that poor people throughout the world are capable and ready to use technology, and eventually this will alleviate poverty. Therefore, it can be said that technology can be one of the tools for social development.

The problem that became the main focus of this journal review was defining social innovation and ob-

taining what types of ICT that was implemented to develop social innovation. The results are expected to provide a reference for further related studies in social innovation through ICT implementation.

2 METHODS

This stage explained the methodology stages done by the authors in this paper review. A systematic review was undertaken using Kitchenham steps (Kitchenham, 2007). First step is determining the topic and the research questions. This is followed by search of literature. The literature are filtered based on certain inclusion and exclusion criteria. The results are assessed further following certain assessment procedure. The final step is reporting the result of the review.

2.1 Determining the Topic

In this stage, author looked for the topic that is important to be the research material. This research related to the topic in the enterprise system, therefore authors tried to find the problem related to the topic. Authors were interested to discuss about social innovation in business that is influenced by the use of ICT. The determination of social innovation can be used various methods. Therefore, author wanted to find the most used method and was suitable to determine the social innovation with literature review.

2.2 Determining the Research Questions

Two research questions are arranged as a guide for conducting mapping studies and identifying research opportunities. Based on the previous explanation, the following were the research questions proposed by this paper:
RQ1: What is the definition of social innovation?
RQ2: What types of ICT are used for social innovation?

2.3 Collecting the Paper

The process of collecting papers for this paper review was based on the popular paper search engine that are Science Direct (sciencedirect.com) and Emerald Insight (emeraldinsight.com). The limitation of the papers was these papers were able to be downloaded in the scope of Institut Teknologi Sepuluh Nopember

(ITS), that means these papers were open access to academic community of ITS.

2.4 Paper Selection

Paper selection steps are intended to select and identify primary studies that provide direct evidence about the research question. From the sources for collecting papers, authors do the selection process based on several stages, as follows:

2.4.1 Keyword Selection

Keywords used in the paper finding in each source engine were "Social Innovation" AND "Information and Communication Technologies" AND "Computer" OR "Social Innovation" AND "Information and Communication Technologies" AND "Mobile", because this paper review discussed a topic about ICT (computer/mobile) for social innovation. Authors have matched the keywords with this paper's objectives.

2.4.2 Inclusion Exclusion Selection

The several inclusion and exclusion used to select the paper before the research was conducted. Inclusion criteria were: written in English; papers published in between 2014-2018; papers match the keyword insert on Science Direct and Emerald Insight. Therefore, exclusion criteria were: no theory books; no textbook; papers that were not focused on Social Innovation; paper that not focus on ICT and its application on Social Innovation.

2.5 Content Selection (Weighting)

The quality of papers evaluated based on inclusion and exclusion criteria. The assessment procedure is based on value associated with scores: Agree/Match = 3, Part Agree/Part Match = 2, Disagree/Not Match = 1, Not Related = 0. This weighting based on advice from Likert (Djaali, 2008). Based on the proposed research question, the following Figure 1 refers to some assessment used on the highest, which was 3 points.

RQ	Assessment
RQ1	• The paper which discussed ICT for social innovation • The paper which compared some ICTs for social innovation
RQ2	• The paper which discussed about the determination of certain social innovation (case study)
	• The paper which provided new method of existing social innovation • The paper which compared some determination methods of social innovation

Figure 1: RQ-based assessment.

3 RESULTS

In relation to the stages discussed on the methodology chapter, this chapter points out on the results obtained from each stage.

3.1 The Result of Paper Collection

By using the keyword explained on the methodology chapter, 2 searches were done on 2 main sources, (Science Direct and Emerald Insight). After doing the inclusion and exclusion, 75 results were found on Science Direct and 17 results were on Emerald Insight, as it can be seen on Table 2 as follows. Then, the title an the author of the paper founded can be seen on Figure 3.

Sources	Result Before Inclusion Exclusion	Result After Inclusion Exclusion
Science Direct	133	75
Emerald Insight	22	17

Figure 2: The result of paper collection.

No.	Title	Authors
1	A Mobile-based arrier-free Service Transportation Platform for People with Disabilities	Jim, Yenchun Wu, Wan-Ju Liu, & Chih-Hung Yuan
2	Technology Acceptance Among Micro-entrepreneurs in a Marginalized Social Strata: The Case od Social Innovation in Bangladesh	Abidur, Syed Rahman, Seyedeh Khadijeh Taghizadeh, T. Ramayah, & Mirza Mohammad Didarul Alam
3	The Social Innovation Potential of ICT-enabled Citizen Observatories to Increase eParticipation in Local Flood Risk Management	Wehn, Uta & Jaap Evers
4	Data-Centered Persuasion: Nudging User's Prosocial Behavior and Designing Social Innovation	Shin, Youngsoo & Jinwoo Kim
5	Socio-technical E-learning Innovation and Ways of Learning in the ICT-space-time Continuum to Improve the Employability Skills of Adults	Martinez-Cerda, Juan-Francisco, Joan Torrent-Sellens, & Ines Gonzales-Gonzalez
6	Technology Upgrading Through co-creation of Value in Developing	Dey, Bidit L., Mujahid
	Societies: Analysis of the mobile Telephone Industry in Bangladesh	Mohiuddin Babu, Mizan Rahman, Manoj Dora, & Nishikant Mishra
7	An Education-based Approach for Enabling the Sustainable Development Gear	Mora, Higinio, Francisco a. Pujol-Lopez, Julio C. Mendoza-Tello, & Mario Raul Morales-Morales
8	Exploring a Complexity Framework for Digital Inclusion Interventions	Serrano-Santoyo, Arturo & Veronica Rojas-Mendizabal

Figure 3: Papers founded.

No.	Title	Authors
9	Mobile Social Money: An Exploratory Study of the Views of Managers of Community Banks	Henrique, Eduardo Diniz, Adrian Kemmer Cernev, & Eros Nascimento
10	A Socio-technical Analysis of Software Policy in Korea: Towards a Central Role for Building ICT Ecosystems	Kim, Hongbum, Dong-Hee Shin, & Deaho Lee
11	Measurement Framework for Assessing Disruptive Innovations	Guo, Jianfeng, Jiaofeng Pan, Jianxing Guo, Fu Gu, & Jari Kuusisto
12	Shaping the Sharing City: An Explanatory Study on Seoul and Milan	Bernardi, Monica & Davide Diamantini
13	How to Use Technology in the Service of Mandkind? Sustainable Development in the City	Kobza, Natalia & Malgorzata Hermanowicz
14	Using Urban Enviromental Policy Data to Understand the Domains of Smartness: An Analysis of Spatial Autocorrelation for All the Italian Chief Towns	Balducci, Francesco & Alessandra Ferrara
15	Creative Economy as a Social Technology Approach: A Case Study in Favela da Mangueira, Rio de Janeiro, Brazil	Maiomon, Dalia Schiray, Cristine Clemente, & Rita Afonso
16	Peace-Entrepreneurs: The PeaceStartuo Experience in Colombia	Prandi, Maria

Figure 4: Papers founded(Cont.).

3.2 Papers Selection

The first selection was carried out through skimming on title, abstract, introduction, literature review and conclusion, in which there was no discussion found related to social innovation, so that the paper belonged to exclusion. By doing that selection, 16 papers of 75 Science Direct journals and 17 Emerald Insight journals were obtained (14 Science Direct papers and 2 Emerald Insight papers) which come under the criteria and then were assessed on Figure 1. Through the use of assessment which was appropriate with RQ explained on methodology, the following Figure 3 is defined as the assessment result of the obtained papers.

Paper	Sources	Point for RQ 1	Point for RQ 2	Total
[1]	Science Direct	3	3	6
[2]	Science Direct	3	3	6
[3]	Science Direct	3	3	6
[4]	Science Direct	3	3	6
[5]	Science Direct	0	3	3
[6]	Science Direct	2	2	4
[7]	Science Direct	3	1	4
[8]	Science Direct	2	3	5
[9]	Science Direct	1	2	3
[10]	Science Direct	0	1	1
[11]	Science Direct	1	3	4
[12]	Science Direct	2	3	5
[13]	Science	3	3	6

Figure 5: Assessment.

Source of Figure 1 : [1] (Davies, 2014) , [2] (Cui et al., 2017), [3] (Mulgan, 2010), [4] (Van der Have and Rubalcaba, 2016), [5] (Ashraf and Malik, 2011), [6] (Cecchini and Scott, 2003), [7] (Thatchenkery et al., 2004), [8] (Sandeep and Ravishankar, 2015), [9] (Lee et al., 2015), [10] (Yunus, 1998), [11] (Kitchenham and Charters, 2007), [12] (Djaali, 2008), [13] (Wu et al., 2018), [14] (Rahman et al., 2017), [15] (Wehn and Evers, 2015) , [16] (Shin and Kim, 2018).

According to Figure 5, the papers whose value was high were paper [1], [2], [3], [4], [15] with 6 as its values. It was assumed that these papers answered RQ1 and RQ2. That means those papers contain the definition of social innovation from expert. Morover, those papers stated the type of ICT that they used and also the case study clearly. Meanwhile, paper [10] had the lowest value, which was 1. This journal only be able to answer RQ2. That means, paper [10] doesn't mention the definition of social innovation from the expert. Beside that, the case study and the type of ICT used in that paper research was not clear.

3.3 The Definition of Social Innovation

There were a lot of perspectives in understanding the definition of social innovation. Various definitions proposed by the researcher in this review journal were compared on Figure 6 below.

Cajaiba-Santana (2014) [3]	Philli (2008) [2]	Murray (2010) [3][16]	Mulgan (2010) [3][4]	Caulier-Grice (2012) [4][7]	Bouchard (2012) [16]
Solving social problems	New solution for social needs	Comprehensive concepts related to the achievement of social goal	New ideas for social needs	New solutions which met social needs	Solution for major social problems
Creating service		Assessing the qualitative growth which was connected with the service	Innovative service which reached the goal	Service	
Inventing new product				Product	
	Values which were mainly obtained by the community	New movement to improve the quality of live for the members of community			
				Process, business model or market that more effective than the existing solutions	Business initiatives with an emphasis on individual and market responsibilities
		New forms of cooperation and collaboration			

Figure 6: The definition of social innovation.

From Figure 6 the researchers emphasize social aspects. Some researchers perceived social innovation as a concept that can provide solutions to problems in society. However, there are two important characteristics of social innovation: first, the novelty and effectiveness of ideas when implemented and second, their orientation towards solving social problems that produce mutual benefits rather than individuals. The researchers say that social innovation also triggers social change (Wehn and Evers, 2015). Social innovation creates new relationships and systems of government that can empower new actors. Social innovation can also generate new ways to collaborate and participate, reduce and integrate the traditional roles of producers, buyers and users. In all cases, **social innovation can strengthen new capabilities for each actor and optimize current resources for the future. From the explanation above, authors concluded that social innovation is innovation that aims to provide solutions to the main challenges faced by the community and, in parallel, improve the capacity of the community and other actors in creating new services and products that benefit not only business but also improve the quality of life of the community**.

3.4 Type of ICT Used for Social Innovation

The type of ICT used for social innovation in each journal is described in Figure 6. In addition, the name of the system is also mentioned and where the research of case studies of each paper was analyzed.

Figure 7: Type of ICT with the application of social innovation.

From Figure 7, the type of ICT that was mostly used as social innovation in the founded journal was mobile application. It was because the application form mobile was in a rapid development. Beside the use in business, mobile application also used to develop society and region. There were 5 papers mentioned about mobile application that could be implemented for social innovation. It was added with a paper which mentioned the usage of all types of ICT which meant they also use mobile application. As in paper [1], it mentioned that ICT in the form of mobile application integrated with provider and government to develop transportation to people with special needs. In paper [9], it also mentioned about mobile payment in some banks in Brazil that could help payment in which useful for the state's economic development. Therefore, based on the reviewed journal, it could be concluded that the types of ICT in the form of mobile application was the most often used by social innovation.

4 DISCUSSION

Social innovation could not be separated from the process of company business. From the result of the definition of social innovation discussed previously, social innovation plays in creating service and new product which is beneficial not only in terms of business but also improve the life quality of the people. Therefore, with a good business management process, a company also could create social innovation that was beneficial for the company itself. Business management itself is also related to the company's strategy. The company's strategy is in the form of long-term plans done by the company, while business processes are activities that are measurable and structured to produce certain outputs (Davenport, 1993).

In social innovation, strategy plays an important role (Vitale, 2005). Business people will direct social innovation projects with detailed plans that will add public value.

In addition, the most serious challenge of social innovation is resources (Cels et al., 2012). Organization that have good resources do not guarantee success if the business owner cannot manage these resources effectively (Sirmon et al., 2011) (Barney et al., 2011). So, it needs to be described how to manage resources in accordance with social innovation to be achieved in an area. From the discussion above, the relationship between each knowledge dimensions can be seen in the form of conceptual model in Figure 8 which can be developed for further research.
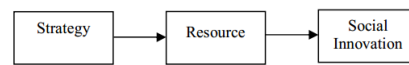

Figure 8: The conceptual model.

5 CONCLUSIONS

After conducting search of journal in the main source (Science Direct and Emerald Insight), with the inclusion and exclusion, it was obtained that 75 results in Science Direct and 17 results in Emerald Insight. During the research, the papers that has highest value are paper [5], [6], [7], [8], [17] with 6 as its values. It was assumed that these papers answered RQ1 and RQ2. Whereas, the paper who has the lowest value which is 1 was paper [14] where the journal only answer RQ2 althought it was no clear enough. RQ1 has been answered that some various definitions from the researcher in the founded journal could be concluded that **"Social innovation is the innovation aims to give solution toward main challenge faced by society and in parallel, improve the capacity of society and other actors in creating service and new product that is beneficial not only in terms of business but also in the improvement of life quality of the society"**. Next investigation was for RQ2 which is the type of ICT that was mostly used to the social innovation in the founded paper. That ICT was mobile application. It was because the application for mobile was in the rapid development. Beside it usage in business, mobile application was also used to develop society and region. For future research, we can related mobile application for Social Innovation with Business Strategy or IS/IT Strategy.

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