Open Innovation And Social Media Use Towards Informatics Reporting: A Systematic Literature Review

Marlita Mat Yusof[a*], Zuraini Ismail[b], Nor Zairah Ab. Rahim[b], Wardah Zainal Abidin[b], Ganthan Narayana Samy[b]

[a]Universiti Teknologi MARA (UiTM), Puncak Alam, Malaysia
[b]Advanced Informatics School (AIS), Universiti Teknologi Malaysia , Kuala Lumpur, Malaysia

Graphical abstract

- Breed innovation through knowledge exchange
- Recognise critical success factors
- Form plan and implement strategy on social media
- Use information reporting to drive business success
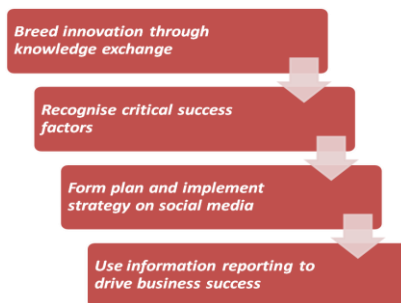
Abstract

In the realm of technology development, open innovation paradigm and social media have both acquired massive attention in extensive researches since past several years. Social media, as the key medium has abundant to offer to support open innovation, thus successful innovation is the key to business rapid growth. This research provides a systematic literature review to identify, classify and summarize the factors of open innovation and social media use towards informatics reporting. Informatics reporting through this dynamic channel have been realized by many organizations nowadays, nonetheless greater number still confine with the traditional reports and are not ready to have linkage with social media platforms. Social media has been absolutely recognized as a powerful communication resource to engage stakeholders in virtual community. Hence, the result from the review suggests that there were six factors impacted open innovation and social media use towards informatics reporting, with transparency being the dominant factor. Eventually, these findings may ease the process of developing a model for open innovation paradigm implementing online platforms in organizations informatics reporting. All in all, this research shall assist organizations to plan and strategize the implementation of open innovation in social media platform for the advantage of their succeeding triumph.

Keywords: Informatics reporting; open innovation; social media

1.0 INTRODUCTION

Over E-globalization has introduced a new approach that practices openness and collaboration among organizations internally and externally; whereby businesses and technologies are connected in a virtual environment. Open innovation (OI) is the new paradigm *that assumes that as the firms look to advance their technology* as introduced and defined by Chesbrough [1]. The goal of the new paradigm is to connect and share knowledge and resources among each other in delivering innovation ventures [2]. To date, OI has been tremendously a favored issue and is being debated extensively in the past and current researches. A vast number of researches are predominantly conducted in the developed countries among small medium enterprises (SMEs), however, not many have been carried out in the developing countries, including Malaysia.

Generally, many organizations concur that innovation is the key to raise greater success, although it is not an assurance that the OI approach would suit every industry in the market, since each organization is unique with its own dynamic operational capabilities. In the OI concept, profitable

alliances are essential to realize new solutions or successful projects through knowledge transfer and sharing resources, and simultaneously help to decrease the operation cost [3]. However, technology transfer is viewed to be the most challenging for many organizations since it entails few critical processes such as research and development (R&D) globalization, rivalry among firms and risk sharing in technology development [4]. Hence, the most cost-efficient means to obtain new knowledge is by involving customers and utilizing their creativity that will contribute to a probable and lucrative product development process [5].

In order to accomplish this, social media platforms are the appropriate tools that enable the wide exchange of ideas besides having the capability to implement collaboratively innovation projects among many organizations [6]. Moving with the technology path, Chesbrough [7] later revised the OI definition, to include either internal or external or both sources of technology to initiate a service or product innovation, and the outcomes can be marketed by its own organization's sales unit via out licensing or through agents and spin-off organizations. Thus, this requires substantial chains of communication and fundamental characteristics. Social media has inaugurated a shift of paradigm in communication by creating a world without barriers for stakeholders that advances extensive and broader yet economical communication [6]. This could be appropriately realized through social media platforms such as Facebook, Twitter and YouTube applications. In addition, multi-functional blog services are also provided by these applications such as Facebook and Twitter, where integration is done between social networking and a virtual blog community [8]. By these means, the stakeholders will be able to comment, share views and provide ratings in these applications that creates a more extensive collaborations and interactions among them [6].

In this digital age, social media has boundlessly revolutionized informative reports by organizations. It has been recognized as a marketing channel by organizations to interact with their existing and potential stakeholders [9]. Particularly, in OI paradigm, identification of proper and compatible knowledge sources are the most essential issues in order to fulfill faster innovations, exploiting greater resources and technology acquisition [10]. Therefore,

social media is the evident role player to foster and support innovation [11]. In the business field, employing the appropriate technology will boost the interaction and integration in the OI process [12]. To materialize this, informatics reports that contain business activities of organizations that implement OI will be conveyed through social media applications. Discussed by Foods [13], the constitutional links business reporting and social media are stakeholders' engagement and transparency. As such, stakeholders of organizations will be able to have the opportunity to share thoughts and views about OI deliverables channeled by social media applications in their reporting.

As far as this research is concerned, the main objectives for this review are to identify, classify and summarize the factors of OI and social media use towards informatics reporting among organizations. This paper is structured into five respective sections. The introduction of the research is discussed in the first section, while the methodology is presented in the second section. Subsequently, the findings and discussion based on the derived results are presented in the third section. The concluding remarks are provided in the final section of the paper.

2.0 REVIEW METHOD

Systematic literature review is a systematic, explicit and reproducible method for identifying, evaluating, and synthesizing the existing. It is known as a rigorous review of search results [14][15]. The applied review protocol by this research is based on guidelines from Okoli and Schabram [14] and Kitchenham and Charters [15].

There are basically four main phases in the systematic literature review method as depicted in Figure 1. Both Atlas.ti and Mendeley Desktop software packages are used to organize the data collection process. Atlas.ti is used to help in quoting the keywords, categorizing each research according to the assigned keywords and finally performing the data analysis to search for the similarities, where as Mendeley Desktop provides efficient reference management tools and allows easier citation generation for each research.
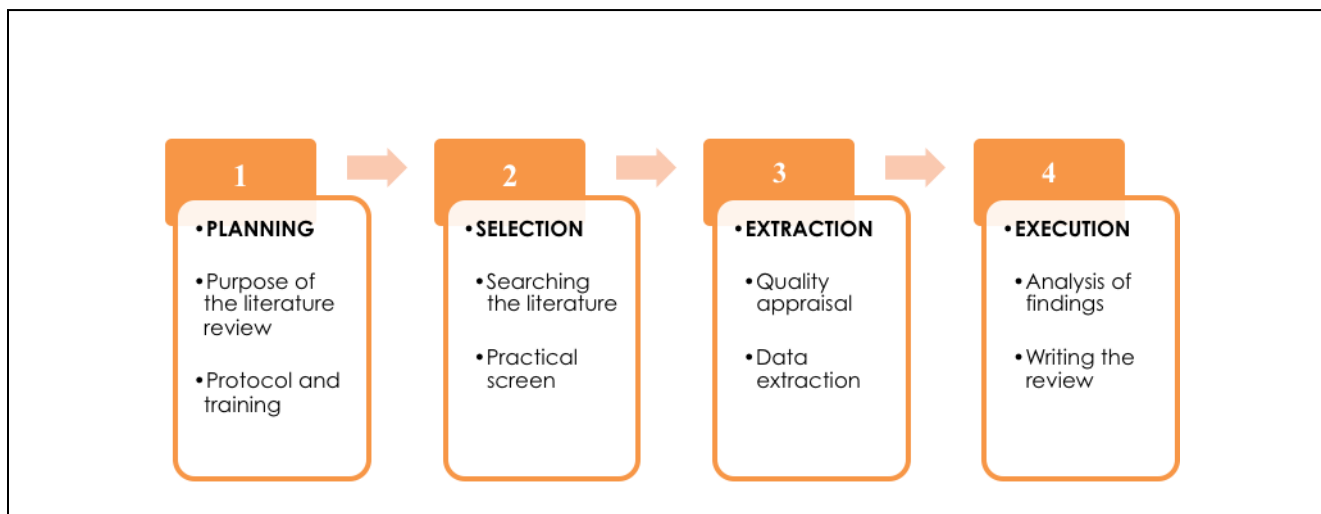
Figure 1 Systematic literature review phase

2.1 Research Questions

The research question specifically addressed by this research is: *What are the factors of open innovation and social media use towards informatics reporting?*

2.2 Primary Research

The primary search process was organized using six electronic databases as the data sources. They are Taylor & Francis Online, ScienceDirect, SpringerLink, IEEEXplore Digital Library, ProQuest and Emerald. The selected databases used are subscribed by Universiti Teknologi Malaysia's library. The inclusion criteria for the research selection comprise of publications in English, research articles that discuss OI in social media use, full text articles with complete referencing and peer-reviewed articles that are published in the years of 2012 until 2015.

2.3 Search Strategy

The searches were carried out using Boolean "and" and Boolean "or" and keywords such as ("open innovation" OR "informatics reporting" OR "social media") OR ("open innovation" AND "social media") OR ("social media" AND "informatics reporting"). The keywords were combined into a series of search strings and they were brainstormed and refined until the list was reasonable to be able to be searched in the electronic databases. The result eventually showed 1,068 papers that are relevant.

2.4 Study Selection

The study selection was conducted in three phases. In the first phase, the search was conducted using six electronic databases, with combined keywords that became series of strings, followed by exploration of articles with the most eligible keywords in the title and abstract in the second phase. Finally, the last phase is ensuring all full text articles selected are subscribed by Universiti Teknologi Malaysia's library.

2.5 Data Collection

The data retrieved from each article were based on criteria as follows: peer-reviewed publications with full reference, publications ranging from years 2012 and 2015, research questions or research objectives and eventually, factors that contribute to open innovation in social media use towards informatics reporting.

3.0 FINDINGS AND DISCUSSION

The In this study, the number of related articles extracted from six online databases is 1068. However, after a stringent evaluation based on the abstracts and the introductions, only 142 articles are selected for review. Ultimately, there are nine (9) articles that are strongly related to the research area that are reviewed. The stages of the process are depicted in Figure 2.
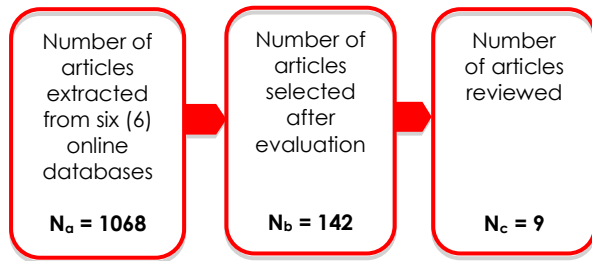
| Number of articles extracted from six (6) online databases $N_a = 1068$ | Number of articles selected after evaluation $N_b = 142$ | Number of articles reviewed $N_c = 9$ |

Figure 2 Data selection and collection process

All in all, six (6) items have been identified as the factors that influence open innovation and social media use towards informatics reporting as represented in Table 1.

Table 1 Factors of OI and social media use towards informatics reporting

Antecedents	Research ID	No. o rs
Transparency	A1, A2, A3, A4, A5, A6, A7	7
Stakeholder Engagement	A4	1
Flexibility	A9	1
Search for New Ventures	A3	1
Optimum Utilization of Resources	A6	1
Open Flows of Knowledge and Information	A8	1

3.1 Transparency

In most articles, transparency is being considered in terms of the status and profile of users, as discussed in article A1 [16], for example to be able to know who is exactly online in the organization and what they are doing and to update on the current relevant news on collaborations. Besides that, article A2 [17] described that transparency in engineering field is highly discussed in scheduling and in use of remote machines that it increased co-workers' visibility and accessibility. This is done by using Skype application, where engineers are able to hide or avoid disturbances, yet are able to produce efficiently simultaneously.

In another context, transparency is needed to better understand how to systematize the profiling for requirements and to search for new ventures. In article A3 [18], it is discussed that the partner of OI, being a service supplier approaches innovation intermediaries and requested on approaches, quantify prospects of results and business references. In the sense of transparency in branding, article A4 [19] highlighted that in order to satisfy customers, quality is the main concern. They gain control when using social media platform where these customers

expect to obtain precisely what they desire. Those brand managers who are still handicapped with online platforms will undoubtedly experience difficulties.

Furthermore, article A5 [20] reviewed that transparency is demanded in self-assessment and benchmarking using social media tool for practitioners and among scholars. This helps to close gaps and initiate new solutions. In addition, it is also a prominent issue discussed in article A6 [21] that involves transparency in facilitating open innovation in terms of investments of products particularly among private companies. Article A7 [22] stated that having applied the OI paradigm, social media plays an important role to reach public that it is mostly used for communicating and informing about projects done internally.

3.2 Stakeholder Engagement

Executing OI paradigm by using social media platform in a way enhances online learning among the customers. The author of article A4 [19] stated that through online marketing, the customers are able to define their needs more precisely by communicating directly with the organization. Besides, the quality of delivering products also could be an aspect to retain customers. Stakeholders' satisfaction is essential and is achieved when they can literally explicate the orders and delivery details to the organization online, and eventually this leads to long-term engagement.

3.3 Flexibility

Article A9 [24] discussed that flexibility is another antecedent that supports OI with online implementation. The new process changes the flow of information likewise supports customers by providing more efficient and effective strategies. Despite, inter-organizations innovations or OI also offers flexible solutions among stakeholders, when negotiating online is much easier and hassle free.

3.4 Search for New Ventures

By applying OI and the use of online platform, the chances to search for new ventures among organizations immensely increase as this is being explored in article A3 [18]. From the negotiating and communication activities among these potential collaborators, more explanation and descriptions of processes can be emphasized and clarified. Therefore it helps broaden the opportunity to search for new ventures from various backgrounds and nature of businesses that match the needs of an organization.

3.5 Optimum Utilization of Resources

One of the antecedents is regarding the issues of cutting down expenditure and investing in

repeatability of products is discussed in Article A6 [21]. OI implementation inherently boosts towards optimum resources utilization in organizations, by reducing the operation and marketing cost and as well as facilitates innovation simultaneously

3.6 Open Flows of Knowledge and Information

Predominantly, the most familiar social media applications such as Facebook and Twitter help in making OI marketing strategy smooth and as well as open the flows of knowledge and information to others. Author in article A8 [23] also stated that this is done generally by having online discussions between employees, customers and other stakeholders.

4.0 CONCLUSION

Open innovation is an issue that is obtaining reputation among organizations since past few years. Currently, most of organizations marketing strategy are evidently moving towards social media technology, with platforms such as Facebook, Twitter and YouTube specifically. Collaboration of OI in the social media use have been gaining popularity in the industry in order to report any information about the organizations to their stakeholders.

Hence, this research proposed a systematic literature review that examines the factors of OI and social media use towards informatics reporting. The articles have been systematically identified, classified and summarized according to the current status of this emergent research area. Eventually, from the four stages of planning, selection, extraction and execution, there were six (6) factors distinguished that influence OI and social media use towards informatics reporting. The review concludes that transparency was the most dominant factor for organizations to apply OI and social media use in informatics reporting. Moreover, other factors identified from the review were stakeholder engagement, flexibility, search for new ventures, optimum utilization of resources and open flows of knowledge and information.

Therefore a model will be developed as a continuity of future research that includes the factors of OI and social media use towards informatics reporting among organizations. In conclusion, this research is essential to expedite the emergent of OI in social media use in order to report any information of an organization. Coincidently, this may assist in terms of improved performance, accomplishment of business tasks, customer-relationship, popularity and favoritism and as well as wider chances of collaborations and partnerships.

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