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OPEN SOURCE INNOVATION IN THE NETWORK CONTEXT: THE READINESS OF MALAYSIA HIGH-TECH INDUSTRY

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Abstract:

This research discusses about the dilemma of implementing open source in the selected Multimedia Super Corridor (MSC) companies. In order to understand this current trend, the research focuses on two main stakeholders' issues namely as; (1) an overview of how the management and its policies formulated to support the progression and the development for open-source sharing, and (2) a discussion of how the firms get involved in free and open source software sharing and R&D which include joining existing open source communities, creating new ones, free riding off for existing open source projects, or deciding to adopt open source software. However, when it comes to ensuring the quality of software from a security standpoint, was there really any difference between open source and licensing software and the dilemma for the organization either to move into the progressing line of open source or remain in the business as usual. In terms of research methodology, this research is based on quantitative and qualitative kind of with the aims to examine the level of awareness of Multimedia Super Corridor (MSC) companies, as well as to envision the next level of ICT evolution. It is expected that the findings from this study, such as new inputs and elements would provide new insight and enable to refine the existing body of knowledge.

Keywords: Open Source, licensing software, readiness.

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Abstrak:

Kajian ini membincangkan tentang dilema dalam melaksanakan sumber terbuka yang dialami oleh syarikat Koridor Raya Multimedia (MSC). Untuk memahami trend semasa ini, kajian ini memberi tumpuan kepada isu-isu yang berkepentingan utama iaitu sebagai ; (1) gambaran bagaimana pengurusan dan dasar-dasarnya digubal untuk menyokong perkembangan dan pembangunan untuk berkongsi sumber terbuka , dan (2) perbincangan bagaimana firma terlibat dalam perkongsian perisian sumber bebas dan terbuka dan R & D yang termasuk dalam menyertai komuniti sumber terbuka yang sedia ada, mewujudkan sumber yang baru, mengaplikasi sumber percuma di luar bagi projek-projek sumber terbuka yang sedia ada, atau membuat keputusan untuk menerima pakai perisian sumber terbuka. Walau bagaimanapun, apabila ia datang untuk memastikan kualiti perisian dari sudut keselamatan, benar-benar terdapat sebarang perbezaan di antara sumber terbuka dan perisian pelesenan dan dilema bagi organisasi sama ada untuk bergerak ke dalam talian yang mengembangkan sumber terbuka atau kekal dalam perniagaan seperti biasa. Dari segi metodologi kajian, kajian ini adalah berdasarkan kepada jenis kuantitatif dan kualitatif dengan matlamat untuk mengkaji tahap kesedaran Koridor Raya Multimedia (MSC), dan juga untuk membayangkan peringkat seterusnya evolusi ICT. Ia dijangka bahawa penemuan daripada kajian ini, seperti input dan elemen-elemen baru ini akan memberi wawasan baru dan membolehkan untuk memperbaiki badan yang sedia ada ilmu.

Kata Kunci: Open Source , perisian pelesenan, kesediaan.

CHAPTER ONE
INTRODUCTION

1.0 Introduction

It is becoming clear that open source sharing with the copyleft is the latest trend in the ICT industry. In the spirit of free and open source software or source code sharing, the scientists and engineers are attempting to establish a community in which information will be freely exchanged, so that one may further brings the understanding of open source and its implications outside the realm of software development.

In line with that concept, this research is aimed to investigate the 50 selected companies established in MSC (Multimedia Super Corridor), or with the MSC status on open-source sharing, the degree of awareness and implementation. In order to achieve this, the research will focus on two main stakeholders' issues:

i. An overview of how the government and its policies formulated to support the progression of the MSC development and transformation for the open-source sharing.
ii. A discussion of how the firms get involved in free and open source software sharing and R&D which include joining existing open source communities, creating new ones, free riding off of existing open source projects, or deciding to adopt open source software.

In light with that, the author wishes to test and further develop his framework (the framework was a part of his PhD work). See also (Hamid, 2008, 2009). This framework was developed in the UK depicts few of the companies which have materialized the open-source concepts that strengthen within the community of ICT. In terms of research methodology, this research is based on quantitative study for theory testing with the aims to examine the level of awareness, readiness, and implementation of these companies, as well as to envision the next level of ICT evolution. It is expected that the findings from this study, such as new inputs would provide new insight and enable to refine the existing framework. So a new framework would be generated to illustrate the context of developing country, to demonstrate the gaps between the developed and developing country and of course to put forward suggestions/solutions for such gaps.

1.1 Background of Study

In viewing report by (Brian Otis, 2007), open source was defined in 1998, however, free software and sharing the source code is the long-established concept, especially in research and university environments. Today, more than 140,000 open source projects. In basic open-source projects, new companies were created and designed to make money on the success of open source technology. Many of these companies either distribute indoor and outdoor versions software, offer support and maintenance services based on open source software or provide consultation, training and system integration services around open source software.

In production and development, open source is methods that promote pragmatic free redistribution and access to the design and implementation details of the final product. Before the phrase open source to be widely adopted, developers and producers used a variety of phrases to describe the concept such increased with the rise of open source internet, and the attendant need for massive retraining computing. Open source code allows the source code itself increase the diversity of production model, access communications, and interactive communities. Open source software movement was born to illustrate the issues surrounding the new copyright, licensing, domain, and users that are created.

Open source model, including the concept of simultaneous but different agenda and different approaches in the production, in contrast with more centralized models of development as commonly used in commercial software companies. One of the key principles and practices of open source software development is the production of peer exchanges and cooperation with the final product, source materials, and documentation are available at no cost to the public. This is increasingly being used in other fields of endeavor, such as biotechnology.

According to (Laurent, 2004), model of free and open source development has made contributions towards calculating, maintaining both research and commercial projects and facilitate the group of people, who may not know, and to help one another. While increased activity has a bright future, all this work is built on the license, legal documents

often look good or difficult to understand. Businesses and individuals who are not always sure what is holding in their decision to participate, and make the license to be used for specific projects may project it. Also, open source software components and solutions means that source code is available, can be used, changed and distributed to other users of the agreed common rules (Brian Otis, 2007).

Furthermore, literature also provides sources on the advantages and disadvantages of open source, which are summarized in Table 1.1.1

Table 1.1.1 Typical advantages and disadvantages of open source

Advantages	Disadvantages
Control – Lets to be control in business.	**Eliminates** - The value of a commercial license for the software.
Flexibility - It is licensed in such a way that can modify it.	**Crack** - Can be enhanced and redistributed by competitors, creating splinter versions of the original code.
Reliability - It is developed in such a way that it is typically more reliable.	**Loss** - Can lead to a loss of control over integrity of the code.
Cost - Used with little to no upfront costs. Pay for the support and when need it.	**No support exists –** Once decide to use open source software it at on your own. There are many self-motivated forums that can help to install and run open source software; there is no qualified support available.
Longevity - Simply contract with a consulting firm, individual programmers, or other third parties.	**No guarantee of updates** - Not paying for the open source software it is bound to give the regular updates. Users can get stuck with the same old version for years without ever getting an update.
(Portelli, 2010), (Westhagen, 2005), (Wiles, 2012)	

Previous research (Westhagen, 2005) identified several reasons that may cause an impact of open source. These reasons are categorized as follows:

i. **End Users** - Impact on end users is positive and clear. They give the client software for free and at competitive prices because of the low threshold of entry for service providers.

ii. **Service Provider** - Service providers can download and install free in users hardware and it is possible to install software on just about any hardware that the service providers have. Also the distribution of open source creates a community of individuals and organizations that will continue to maintenance development should go out of existence, eliminating that risk to service providers.

iii. **Consultants** - Open sources software can be a real advantage to the consultant, especially if they choose to be of service suppliers. Because it is a web-based service, it is easy to distinguish from others through specialized websites and on the contrary, intellectual property or the organization that develops them.

iv. **Software House** - A software house specializing in getting the best out of a cluster calculation may develop a proprietary replacement for the term of daemon may do an excellent job optimizing workflow.

1.2 Problem Statement

There are a lot of opportunities to be success in Malaysia technology based companies. Many companies in Malaysia applied open sources software, licensing and others. But, the problem is, how far all this application can ensure the success of the company in Malaysia to compete in global market. Nowadays, many companies are prefer using software license that need to buy in higher price rather than open sources software that provide free and open to public in same or better features. Therefore, from the cited by (Andrea Bonaccorsi, 2003) open source can now compete with software developed by the firm as an impressive achievement, especially as open source programmers rarely meet, and it's show that open source can help the company to be success. However, what is the best solution to ensure open source are fully apply by technology based companies in Malaysia, because certain companies that already establish such as Sony Company that change from lean production to open source in order to be successful in future and from that ideas, why not Malaysian itself involved in open source software. So that, this topic will be propose as a study of open sources innovation in technology based companies in Malaysia context and how to ensure it really successful by giving the prediction and solution.

1.3 Research Objectives

A primary aim of the research described in this paper is to use a practical approach, with respect to the awareness and implementation of open source innovation in Malaysia firm.

i. To examine the readiness of Malaysian High-Tech industry in the implementation of open source innovation in the networks context.

ii. To investigate the effectiveness and implication of implementation of open sources to Malaysia ICT companies.

1.4 Limitation of Study

A number of limitations in conducting this study were expected, and they are:

i. Lack of awareness of open source makes some respondents responded with very low response rates in terms of the number of questionnaires. This has become a major challenge for many researchers who conduct research organization in Malaysia.

ii. Weak cooperative and responding from some organization was the limitations that have been faced by this research and reluctance of some respondents to answer the research questions as if they believe that the information should remain confidential.

iii. Finally, due to time constraints, the awareness and implementation of open source in the network context are under investigation for future result.

1.5 Significance of Study

The significance of this research is:

i. This study will expand the body of knowledge in the open manufacturing especially in open source literature.

ii. It will help companies to take decision about the effectiveness, awareness and implementation of open source which influence the quality and performance at workplace.

iii. It will provide for other researchers, academicians and students a reliable data about the awareness and implementation of open source in the network context.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction of Open Source

Current research in the field Technology Management calls for more theoretically grounded research for open source appropriate for a given context. This study will demonstrate that the context within which open source is used is changing. The key questions are: "*Is Malaysian industry ready for the emerging context?* "*What are the gaps in our knowledge?"* and "*Which lines of enquiry do we need to pursue?"*

From proprietary to Open Source reflect that this transition is from the principle of closed source based on a profit motive to the principle of open source based on a non profit motive. The transition line is where the rights of ownership are waived and the public are allowed to share and given access (Hamel, 2007; Krogh, 2003; Muir, 2005; Ulhøi, 2004; von Hippel & von Krogh, 2003).

One of the events occurring at present is 'Open Source Innovation', where the organization invites outsiders to comment on their suggested design improvements. Ideally, in an open source context, this creates more opportunities for developing and exploring new innovative ideas. Thus, the open source movement brings the ideas of

participation, collaboration and creativity to our social structure. This waives the orthodox idea of proprietary and copyright and gives way to the new domain of copyleft[1].

According to (Ulhøi, 2004) claims that the open source movement grew out of the principle of closed source (for example, the protection of intellectual rights and private investment was motivated by profit) - the latter is based on the commonly owned goods, as goods based on non-profit motives (Ulhøi, 2004). Contrary to the closed-source innovation model, the problem of non-contributors or free riding is not a concern for open source innovators, since their personal gains are considerably higher than those of free riders (von Hippel & von Krogh, 2003). Free riders, it seems fair to assume, are unlikely either to acquire social recognition/status or experience any significant learning curve effect.

Thus, in terms of psychological motives are based largely on the premise that intrinsic motivating factors exist which allows the participants to achieve a degree of personal satisfaction. If the concept 'the best idea to win' – meritocracy is within the networks (i.e. communities of practice), then people will be motivated more by peer recognition and community prestige (reputation). This means that the continuous improvement movement is placing a greater emphasis on community opinion. However, some contributors have looked for external rewards by stressing the importance of peer recognition (communities

[1] This transition is from legal rights protection to the waiving of certain public rights. A particular example of Copyleft is the General Public Licence. See Ulhoi(2004); de Laat(2005).

of practice) (Johnson, 2002). He argues that such rewards can later be exported to the outside and translated into traditional monetary rewards.

As such, learning opportunities have been proposed as another important driving force within this open source context (Lakhani & von Hippel, 2003) where learning by answering questions from users is a motivating factor for open source software developers. Continuous learning opportunities simultaneously provide a process of development for contributors and improvement for participators. Thereby, the future of open source movement will provide more learning opportunities for an individual in the team and the organization. As a result, the staffs are given more space and freedom for their development. This also becomes the platform for the staff to increase and equip their knowledge.

The open source movement puts forward the view that customers should participate actively in the product and services development, and share their thoughts and reviews of the products - customers provide a wide variety of skills and motivation levels, which promote dialogue with producers or manufacturers and among consumers. This two-way communication is believed to increase transparency in the relationship between producers, suppliers and customers. In addition, this movement provides a platform for promoting new innovations and fostering new knowledge.

This reflects the situation where continuous customer engagement and re-engagement in the form of collaboration, innovation and learning with the customer as an integral part of the network. This view is in line with (Prahalad & Krishnan, 2008) who claims that customers are increasingly a source of competence. An informed and active customer base is emerging. Customers are willing to engage and co-create their personalized experiences (Prahalad & Krishnan, 2008).

Thus, this creates a learning process for the producers to learn from customers' feedback. In the meantime, it also provides opportunities for the producers and customers to increase their knowledge literacy. As a result, customers become well informed and demand higher and better quality products and services.

Furthermore by implementing open source, organizational policies is critical to ensure that employees do not use open source in a way that will bring undesirable consequences. Any use of open source should have a real determination by management that it would not conflict with the company's business model. The uncontrolled use of open source can force an organization to share proprietary source code or face an injunction from the sale of products. Other than that, companies need to look for opportunities to acquire and share their innovations with others (Kemp, 2009). In certain technologies, particularly by release as open source, it can be a good strategy to support the new innovation to be implemented. This requires a proper analysis of the value of each feature that lead to the product, so that the right features are from open source or stored in proprietary.

The advantage of this movement is that the quality of the product will be improved and amended faster through the pooling and development of ideas and solutions. Therefore, this is likely to increase the pace of change and the response from the producers and service providers. Occasionally, this may help to mitigate the issues arising from customer complaints, and reduce the time of response to solution.

Overall, it may be fair to say that producers will enjoy the benefit, as they gain the trust of their customers (as the customer becomes the contributor and participator in the web). There is also a need for more transparency in dealing with their relations with customers to fully benefit from this movement.

2.1 Concept of Multimedia Super Corridor (MSC)

MSC Malaysia was the initiative of ICT Malaysian nation to attract world standard technology companies when educate to the local ICT industry. It is fully supported by Malaysia Government; MSC Malaysia led country transformation towards a K-economy on past decade and half. MSC Malaysia was gateway for industry ICT in Malaysia and region. Status MSC Malaysia was recognition by Government from Malaysia through Multimedia Development Corporation (MDeC), for businesses ICT and ICT-facilitated which developed or use multimedia technology to produce and increase products and their services. It also world standard a token of service, achievement, passport and gateway to a sum privileges allowed by Government from Malaysia for business entity.

MSC Malaysia status is awarded to three (3) types of business entities, each with a set of different application criteria and guidelines. The qualifying business entities are:

i. Private limited companies (i.e. Sendirian Berhad)
ii. Institutions of Higher Learning
iii. Incubators

Furthermore, MSC Malaysia revolutionized industry ICT in Malaysia and help to contribution of the national economy. By doing that, MSC Malaysia has successfully continued digital gap between countries and the capacity conduct business worldwide.

As a general guide, following are the Qualifying Criteria for MSC Malaysia Cyber city and Cyber centre status:

i. Driven by State Government, and MSC Malaysia Cyber city or Cyber centre stakeholder
ii. Broadband and infrastructure readiness
iii. Customer focused management with KPIs
iv. Competitive environment to attract investment, nurture start-ups or SMEs and house knowledge workers
v. Talent pool availability
vi. Proximity to universities and research centre
vii. Use relevant Flagship Applications to enhance service delivery
viii. State ICT Blueprint providing value propositions for local economy

According to (Sharmila Jayasingam, 2012), Multimedia Super Corridor (MSC) status companies selected as the research site. MSC companies are characterized by (1) a high number of Knowledge workers and (2) involvement in knowledge intensive industry sectors.

2.2 Concept of Open Innovation

Open innovation concept has become widespread interest. It is especially related to firm who implement open innovation. Open innovation have been developed by innovation practitioners, that mostly active in high-tech industry, it also discussed and implement on innovative undertaking (Oliver Gassmann, 2010). Open innovation was a trend expanding in many firms across industry. While most previous research states that management initiative has focused on knowledge exploration out. Open innovation not a trend recently. It reflects long-term an evolution to firm. Therefore, open innovation is a sustainable development from management fashion. For many firms, open innovation was a requirement and not just an option as they do not can perform comprehensively.

In so doing, the concept of open innovation has emerged, with processes deemed to be beyond the boundaries of the firm. Company now want to include in their business model is not only commercialization of their own ideas, but also external ideas. (Sungjoo Lee, 2010). Firms also need to internally develop technological knowledge before, which requires absorptive capacity, so that successfully hinge at open innovation process want enter. Open innovation was sometimes combine with ideas which related open source software development.