The Impact of Social Media Adoption and Cloud Computing Adoption on Manufacturing Firm Competitiveness: The Mediating Effect of Supply Chain Responsiveness

By

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ABSTRAK

Apa yang diperlukan dalam dunia perniagaan yang dinamik masa kini demi memastikan daya saing firma dan kemampanan perniagaan adalah rantaian bekalan yang mampu bertindakbalas dengan pantas. Oleh itu, firma berusaha untuk meningkatkan prestasi pengurusan rantaian bekalan mereka melalui penggunaan teknologi maklumat supaya boleh memberi tindak balas yang lebih baik kepada keadaan pasaran yang sukar diramalkan.

Untuk sebab ini, kertas ini bertujuan untuk membina dan menguji satu rangka kerja penyelidikan yang meliputi impak penggunaan media sosial dan penggunaan pengkomputeran awan kepada daya saing firma dan kesan pengantara rantaian bekalan responsif (daya tindak balas sistem operasi (OSR), daya tindak balas proses logistik (LPR) dan daya tindak balas rangkaian pembekal (SNR)). 129 firma-firma pembuatan di Malaysia merupakan sampel kajian kuantitatif dan data telah dianalisis menggunakan teknik Partial Least Squares (PLS). Hasilnya menunjukkan hubungan positif antara pemboleh ubah utama seperti di antara penggunaan media sosial dan daya saing firma, dan penggunaan pengkomputeran awan dan daya saing firma. Kesan pengantara daya tindak balas rantaian bekalan turut diuji dan dibincangkan. Hasil kajian mencadangkan bahawa media sosial dan pengkomputeran awan boleh menjadi alat yang berguna untuk firma-firma pembuatan untuk meningkatkan daya tindak balas rantaian bekalan dan yang paling penting, daya saing firma. Batasan kajian, cadangan-cadangan untuk kajian masa depan dan implikasi bagi pengamal juga dibincangkan.

ABSTRACT

What is needed in today dynamic business environment in order to ensure firm competitiveness and business sustainability is a supply chain with rapid response. Hence, firms are relentlessly striving to improve their supply chain management through the use of information technologies in order to better response to the volatile market conditions.

In the light of this, this paper purports to construct and test a research framework that comprehends the impact of social media adoption and cloud computing adoption on firm competitiveness and the mediating effect of supply chain responsiveness (operations systems responsiveness (OSR), logistics process responsiveness (LPR) and supplier network responsiveness (SNR)). 129 manufacturing companies in Malaysia formed the sample of this quantitative study and data was analyzed using Partial Least Squares (PLS) technique. The result demonstrated positive association between major variables particular the significant relationships between social media adoption and firm competitiveness, and cloud computing adoption and firm competitiveness. The mediating effect of supply chain responsiveness were also tested and discussed. The research finding suggested that social media and cloud computing could be a promising tools for manufacturing firms to enhance their supply chain responsiveness and most importantly, firm competitiveness. Limitation of study, recommendations for future research and implications for practitioners were also discussed.

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter introduced the outline of the study which began with the background of study and followed by the problem statement. Subsequently, the research questions and research objectives were presented, followed by significance of study in terms of theoretical contribution, practical contribution and social contribution. This chapter was concluded with the definition of key terms and lastly, the organization of dissertation.

1.2 Background of the Study

In today's fast moving and evolving business environment, the ability to cope with the rising customer demand oscillation as well as dynamic market condition is crucial for a firm's competitiveness and business sustainability. Furthermore, the globalization of business has also brought forth tremendous impact on firms where competitiveness of a firm becomes the key to success.

As Malaysia taking up a pivotal role in the Association of South East Nations (ASEAN) and also the regional economic integration as a leader of Asean Economic Community, it is exceptionally crucial to ensure the readiness of Malaysia firms to be able to compete regionally.

According to the Global Competitiveness report 2014-2015 released on 3rd September 2014 by World Economy Forum (WEF), Malaysia's ranking has improved

to the position of 20th out of 144th countries as compared to previous year report where Malaysia was ranked at 24th position out of 148 countries. With the aspiration to become a high-income as well as knowledge-based economy, Malaysia made advances to be placed among the top 20 most competitive economies globally. Meanwhile, among Asia Pacific countries, Malaysia has improved its rank from 7th last year to 6th, ahead of countries such as Australia (7th), Republic of Korea (8th), China (9th), Thailand (10th), Indonesia (11th), Philippines (14th), Vietnam (15th), and India (16th). Further, according to the report, among 24 countries, Malaysia is ranked as the second most competitive economy in the transition stage from efficiency driven to innovation stage of development.

However, despite severable positive assessments from WEF, low technological readiness was found to be one of the major competitive challenges faced by Malaysia. Malaysia was ranked at 60th position, dipping 9 places from the 51st position in previous year report. According to WEF report (2014), technological readiness is to "*measure agility with which an economy adopts existing technologies to enhance the productivity of its industries, with specific emphasis on its capacity to fully leverage information and communication technologies (ICT) in daily activities and production process for increased efficiency and enabling innovation for competitiveness* (pg.7)."

Apart from that, a report has been released by World Bank on Malaysia firm competitiveness in year 2009. According to this report, Malaysia's growth has been slowing down to a level well below its Asia competitors, which include China and India. There were a few reasons why Malaysia fail to remain competitive compared to its key competitors in Asia according to Productivity and Investment Climate Assessment Update (2009). One of the reasons was the inability to maintain high

volume production with low cost. Another reason was failure in moving up the value chain and achieving rapid growth in the knowledge and innovation based products and services.

As reported by Word Bank in the trade competitiveness report (2014), the recovery in export performance (particularly from electrical and electronic E&E sector) had led to improvement in Malaysia economy performance. However, the report had also stated that there was a decline in Malaysia total exporting market share from 1.35% to 1.22% between year 2005 and 2013. In contrast, countries such as Thailand, Korea and Vietnam had seen market share expansion in the said period. Due to reason such as competition and risk management, many firms in the electronics global value chain possess more than one alternate productive capacity in multiple countries. For example, the survey conducted by Japan External Trade Organization reported that 48% of Japanese affiliated companies had alternatives to produce or supply in another country (JETRO, 2013). This implied that Malaysia manufacturers are facing stiff competition from other countries with similar production capacity as these countries are potential substitutes in the eyes of foreign investors. Hence, it is extremely imperative for Malaysia manufacturers to seek ways to improve competitiveness in order to drive long term sustainable economic growth and also to continuously enhance competitive position.

To maintain competitiveness in the business, business needs to put heavy focus on delivering value to the customer. Ensuring that the product and services offered by the firms are able to meet customers' needs is indeed crucial. However, while doing so, the ability to also provide more values to the customers compared to other competitors is indispensable to differentiate itself from competitors. This is thus driving the urgent need for supply chains to become more responsive. Besides, factors

such as shorter product life cycles and rapid introductions of new products also bring further challenges to business. Moreover, the development of information technologies has led to increased expectations from customers as they becoming more sophisticated and well-informed. Hence, consistent with Thatte (2007)'s opinion, the ability to meet unforeseen changes in demand is exceptionally important for the supply chain industry.

The most efficient global supply chains can be easily challenged by unexpected events such as natural catastrophe, sudden change in customer demands, or man-made disasters. One of the recent examples would be the large anti-China protest by Vietnam workers and outbreak of public disorder in Vietnam which led to halted operations by many foreign-owned factories such as Chinese, Taiwanese and Singapore-owned plants (The Star, 2014). Similarly, many Japanese automakers and manufacturers which made Thailand their manufacturing and export base had been severely affected by the flooding in Thailand in year 2011 (Reuters, 2011). When such natural or man-made incidents happen, this is where supply chain responsiveness can come into the picture to save the day. Supply chain need to be able to respond rapidly in a business environment where customer demands are getting more sophisticated, and events that lead to supply disruption are increasing (Thatte, Rao & Ragu-Nathan, 2013). Interestingly, the recovery of Malaysia's electrical and electronic (E&E) export in year 2013 seemed to coincide with the decline of Thai electrical and electronic (E&E export) which was largely influenced by Thai floods (World Bank, 2014). Under the threat of fiercer international competition and risk of substitutions, it was more than ever critical for Malaysia firms to ensure that they possess the necessary competitiveness in order to adapt to such challenging global business environment.

In short, in order to sustain in the global market, supply chains are forced to pursue continuous improvement in responsiveness and agility to ensure sufficient readiness to counter possible threats posed by the ever-changing and unpredictable environment. A responsive supply chain will be able to create competitive edge for firms involved in the value chain. Besides, outsourcing of value chain operation is gradually becoming a common practice so that firms can focus on their core business and activities. As such, the complexity of information sharing in a value chain has increased due to more parties involved in the value chain. The effective use of information technologies to ensure smooth flow of information and business data among members in the supply chain becomes the key to survive in such environment.

Since the introduction of computer and internet, the business world is getting more accustomed to the integration of technology usage in business application. The wave of new technological evolutions and innovations, particularly the emergence of social media and cloud computing, has radically changed the way how businesses operate in many industries. Many firms have long undergone the tremendous process of embracing various state-of-the-art technologies in order to stay abreast of other competitors.

Supply chain industry is undoubtedly one of the industries that have been increasingly relying on IT-based solutions. Information technologies have practically become the backbone of supply chain management. Authors such as Marinagia, Trivellas and Sakas (2014) and Acar and Uzunlar (2014) advocated the importance of IT in gaining sustainable competitive advantage in supply chain. Meanwhile, Gunasekaran et. al. (2008) had also indicated IT as an important component that affects supply chain responsiveness.

Supply chain, constituted by numerous upstream and downstream parties, can be large and complex. Circulation of knowledge and critical information could be complicated to the extent of creating organizational and functional silos, where none of the parties might possess full detailed information about the supply chain. An efficient gathering and accessing of information is critical to ensure smooth operation of supply chain activities across the network. To address this problem, O'Leary (2011) has discussed the potential use of social media as the tool to remedy the weakness of information flow among supply chain members.

The advances in social network technologies had been bringing tremendous changes to firm structures and value network. The efficient use of social media in social and business environment can generate great competitive advantage for business nowadays. Many industries had incorporated social media sites (i.e. Facebook, blogs, Twitter etc) in organizational strategies for the purpose of competitiveness and managing business risks (Schroeder, 2014).

There has been increasing effort and attempts to utilize social media to improve business competitiveness. For instance, social media has long been intertwined with marketing and advertising. However, the power and potential of social media application remain largely untapped. According to Jussila et al. (2014), the poor adoption of social media and lack of knowledge in applying social media to the business context was probably affected by the attitude caused by wrong perceptions among managers. When social media comes into the picture, managers typically associate it with Facebook and Twitter. They tend to perceive these social media sites were mainly meant for personal use and thus fail to recognize that these were only minor part of social media genre in business (Jussila et al., 2014).

Social media, if being used in the appropriate ways, can actually provide strategic value to the entire value chain which include but not limited to procurement, logistics, trading partners as well as customers. Not only can social media be used by companies to increased demand for their product and services, it can also be used to enhance communication with customers, employees and also business partners.

Social media can be used to facilitate active engagement among all units in the value chain in order to maintain a competitive lead. According to research conducted by Guinan, Parise and Rollag (2014), most managers has recognized that companies can only survive in current competitive global economy if they are able to find the most effective ways to engage and collaborate with all key stakeholders (i.e. employees, customers, suppliers etc.). Given the fact that key stakeholders are no longer limited by geographical boundaries due to globalization, social media will undoubtedly become the critical tool for worldwide interactions and communications.

McKinsey Global Institute (2012) had conducted a survey on four sectors (consumer packaged goods, financial services, professional services and advance manufacturing) on the usage of social technologies. According to the survey, although there are 72% of companies using social technologies, most of the firms fail to achieve the full potential advantages offered by social media. The mainstream use of social media was mostly in the marketing field despite social media also having great potential as a driver for a change in day to day business operations. McKinsey Global Institute (2012) asserted that, had social technologies been utilized to its full potential, it would have improved the overall productivity of the value chain and might potentially generate annual value from $900 billion up to $1.3 trillion across these four sectors.

Considering the instantaneous and ubiquitous attribute of social media and the dire need for effective timely communication in supply chain network (Jin, Vonderembse, Ragu-Nathan & Smith, 2014; Roh et al., 2014), it would be beneficial to explore the potentials of social media in the context of supply chain and its impact on the manufacturing focal firm competitiveness. Home Depot, for instance, had demonstrated the integration of social media in its supply chain management by adopting an internal social media site called" The Warehouse". This private social media site was used for internal communication and knowledge transfer. It helped to improve the connection and communication among different business functions and operations and facilitate sharing of best practices and issues impacting the business. In view of the potentials social media plays in supply chain, social media is thus selected as one of the important variables in this study.

On the other hand, cloud computing diffusion has been generating increased interest among firms due to its ability to execute data transactions along value chain activities, while at the same time incurring lower ownership cost due to cloud computing can facilitate scalable on-demand computing power and reduce the needs to support infrastructure (Cegielski et al., 2012; Low, Chen & Wu 2011) . Cloud computing can benefit the firms by enhancing the speed and quality of business and customer communications, coordination among firms, as well as access to information mobilization (Low et al., 2011). In fact, cloud computing is also one of the focus area in Malaysia ICT Roadmap in the effort to improve Malaysia's global competitiveness.

Cloud computing had been associated with a number of supply chain studies. Kong, Fang, Luo and Huang (2015) and Lu and Teng (2012) had discussed the use of cloud computing in facilitating information management in logistics which is a part of supply chain. Wu, Greer, Rosen and Schaefer (2013) had presented a comparison of

strategic vision and the current states of cloud-based manufacturing model. Meanwhile, Oliveira, Thomas and Espadanal (2014) had conducted a study to explore the adoption intentions of cloud computing among manufacturing and service sectors.

At first glance, social media and cloud computing seems to be a distinct and different standalone technologies, be it from a business perspective, or from a technical viewpoint. The only thing seemingly in common for these technologies is their growing popularity which is putting more pressure on firms to catch up to the trend, or risk lagging behind other competitors. However, the fact is, there is actually many examples where cloud computing and social media are being intermingled in many ways. For instance, social network sites or social applications can be hosted on cloud platforms (Ahuja & Moore, 2013; Lu & Teng, 2012). Data and information are firm's primary assets as effective use of this asset can help firms to differentiate themselves from competitors (Demirkan & Delen, 2013). Social media which have massive number of users can provide a large dataset and useful information for business analysis purpose. Further, in this era of information explosion where the use of electronic gadgets and social media which generated high volume of digital data is getting common and widely accessible, managing the ever growing data can pose great challenges to firms. Big data is only useful to a firm if the right data can be transformed into the meaningful information through appropriate analytical process. Besides, big data require considerably huge computing power to perform the necessary analysis. To address these challenges, cloud computing can serve as the best solution in terms of cost and efficiency, as proposed by Ahuja and Moore (2013) and Demirkan and Delen (2013).

Furthermore, the utilization of social media and cloud computing ultimately leads to the same goal, which is to achieve business efficiency and responsiveness by

enhancing communications and exchange of information, in order to stay competitive in the global business world. Studies had often associated the benefits of social media and cloud computing in areas such as information sharing and communication and coordination among multiple parties (Ratliff & Kuntz, 2014; Weinberg et al, 2013; Cegielski et al., 2012; Mohamed & Pillutla, 2014). Hence, it is definitely worthwhile to consider the application and integration of social media and cloud computing in supply chain strategies, in order to harness the full advantage of these technologies to enhance firm competitiveness.

1.3 Problem Statement

While social media, cloud computing, and supply chain responsiveness had been discussed in recent studies in respective manners, few studies had linked these together as a possible determinants for firm competitiveness (Georgescu & Popescul, 2015; Chae, 2015; Gruner et al, 2013; Arora & Predmore, 2013; Baghdadi, 2013; Cegielski, 2012; Ahuja & Moore, 2013, Oliveira, 2014; Pasquale, 2013; Thatte et al., 2013; Youn et al, 2014; Roh, Hong and Min, 2014; Yusuf et al, 2014)

Researchers such as Gunasekaran et al. (2008), Thatte et al. (2013), Roh et al. (2014) had stressed the importance of collaborations within value chains and information sharing as few of the important enablers that shapes a responsive supply chains. The finding from Thatte (2007)'s study revealed that higher level of supply network responsiveness led to higher level of firm's competitive advantage. However the aforementioned researches contributed more on theoretical viewpoints and did not specifically indicate how exactly these enablers can be practically applied in the

supply chain context to enhance responsiveness and create competitive advantages for firms.

As social media usage in organizational context is relatively new, most of the existing relevant researches were conceptual, descriptive or case-based. Studies related to social media focused on adoption intention and had been conducted in various methods with some using quantitative approach (Kahar, Yamimi, Bunari, & Habil , 2012) while some in qualitative manner (Parveen et al., 2015; Sarosa, 2012; Durkin et al., 2013; Huang et al., 2013). While there were studies that discussed the role of social media in organizational context (Georgescu & Popescul, 2015; Arora and Predmore, 2013; Ratliff & Kunz, 2014; Barnes and Jacobsen, 2013; Jussila, Kärkkäinen and Aramo-Immonen, 2014) studies on social media in supply chain contexts were relatively rare (Chae, 2015; O'leary, 2011).

Arora and Predmore (2013) had highlighted the importance of social media's role in facilitating collaborations within organizations in the social age. To become a social business which continues to innovate and maintain a competitive lead, using active engagement as a tool with suppliers as well as buyers is imperative. Garrigos-Simon et al. (2012) had also stressed the importance of social networks and virtual communities in understanding current changes in the business environment.

Despite the common perceptions on social media's advantages that have been typically being associated with marketing, social media can actually be used as strategic tool for the entire value chain and bring numerous benefits to other business functions. With the advent of technologies, social media can serve as a powerful platform which can create diverse communication channels between firms and customers, firms and partnering entities or other stakeholders. Such connectivity is

essential in an increasingly network society nowadays. Social media can increases the conversations a company has with parties such as customers, industrial influencers, suppliers, as well as employees, and at the same time, decreases the costs required if these conversations are to be done through conventional channels (Arora & Predmore, 2013).

Whilst supply chain has been making aggressive progress in adopting supply chain technologies to enhance the operations, it remains a laggard in the use of other potential tools such as social media and cloud computing. Social media adoption in most of Malaysia firms is still at its infancy. According to a survey conducted by The Associated Chinese Chambers of Commerce & Industry of Malaysia (ACCCIM) on small and medium-sized enterprises (SME) sector in year 2012, companies that were less than 3 years in operation were more receptive towards using social media. 51% of these respondents claimed that they had set up their own social network on social media sites such as Facebook or Twitter.

Meanwhile, according to a survey conducted by PwC Malaysia (2013) which surveyed the use of social media among Malaysia firms and the level of senior management involvement, 75% respondent felt that social media are underutilized by Malaysian businesses as a business tools. Meanwhile, 84% of respondents agreed that social media at workplace drive innovation, and 60% claimed that they do not have a budget for social media yet, 70% of respondents agreed that social media assist their leadership respond better in times of crisis. This survey result implied that Malaysian businesses recognized the various potentials of social media. However majority of them merely established presence in social media but did not have proper strategy and process in place to make social media embedded in their business operations.

On the other hand, despite being widely promoted as a new technology that provide numerous advantages to firm, cloud computing adoption rate has been growing at a rate much slower than expected. Concern of unforeseen outages or failure downtime or complexities of implementations were among the few barriers that hinder the supposed significant adoption rate of cloud computing (Low et al., 2011). However, the research conducted by Alshamaila, Papagiannidis and Li (2013) stated that most early SME adopters were satisfied with the level of compatibility and complexity offered by cloud computing.

Although social media and cloud computing had both been generating great interest among researchers, few contributions were found discussing actual impact of the usage of these technologies on firms which had adopted the social media and cloud computing, especially in the context of supply chain. Most of the past studies focused on either discussion on potential usage or adoption intention among firms (Guinan, Parise & Rollag, 2014;Ahuja & Moore, 2013; Marston et al, 2011; Weinberg et al., 2013; Arora & Predmore, 2013; Vuori, 2012; Parveen et al., 2015; Durkin et al., 2013; Alshamaila et al., 2013; Gupta, Seetharaman & Raj, 2013).

Given the needs to enhance Malaysia firms' competitiveness to sustain the ever changing business condition, it is crucial for firms to find a remedy that they can put into practice to enhance their competitive advantages. Many attributes of social media and cloud computing fit well as a potential business tool that may address the components that contribute to a responsive supply chains from past studies (Roh et al, 2014, Thatte et al, 2013; Gunasekaran et al 2008).

This study intended to further extend the theoretical models presented by other scholars (Roh et al, 2014, Thatte et al, 2013; Gunasekaran et al 2008) by using

existing information technologies, namely social media and cloud computing which were yet to be widely adopted by the industry. The review on published research discovered that current literature focused more on conceptual and descriptive and rarely discussed actual usage and impact of social media and cloud computing in supply chain. To close the gap of scarcity in literature, this study intended to shed some light on how these technologies impact supply chain responsiveness and firm competitiveness. The study will also further investigate current and potential use of these social media and cloud computing in supply chain.

1.4 Research questions

This study raised the following questions:

1. What is the relationship between social media adoption and supply chain responsiveness?
2. What is the relationship between cloud computing adoption and supply chain responsiveness?
3. What are the impacts of social media adoption on firm competitiveness?
4. What are the impacts of cloud computing adoption on firm competitiveness?
5. What is the relationship between supply chain responsiveness and firm competitiveness?
6. Does supply chain responsiveness have mediating effect on social media adoption and firm competitiveness?
7. Does supply chain responsiveness have mediating effect on cloud computing adoption and firm competitiveness?

1.5 Research Objectives

This study aimed to identify the usage of social media and cloud computing among manufacturing companies in Malaysia and also the impact of social media usage and cloud computing usage on firm competitiveness, with supply chain responsiveness as an intervening variable in this study which has an effect on firm competitiveness. In order to answer the research questions, the study intended to achieve the following research objectives:

1. To examine the relationship between social media adoption and supply chain responsiveness.
2. To examine the relationship between clouds computing adoption and supply chain responsiveness.
3. To analyze the impact of social media adoption on firm competitiveness.
4. To analyze the impact of cloud computing adoption on firm competitiveness.
5. To examine the relationship between supply chain responsiveness and firm competitiveness.
6. To investigate the mediating impact of supply chain responsiveness on the relationship between social media adoption and firm competitiveness.
7. To investigate the mediating impact of supply chain responsiveness on the relationship between cloud computing adoption and firm competitiveness.

1.6 Significance of the Study

There were three subsections of contribution of this study, encompassing theoretical contribution, practical contribution and also social contribution.

1.6.1 Theoretical Contribution

As discussed in the previous section, researches that examine the impact of social media as well as cloud computing in supply chains and firm competitiveness remain sparse. With purpose to fill the gap caused by the lack of literature and research focusing on social media and cloud computing in supply chain, this study represent one of the first attempt to provide a contribution in investigating the impact of the said information technologies and explain how they affect supply chain responsiveness and Malaysia manufacturing firm competitiveness.

This study is also the first attempt to integrate social media and cloud computing into a new theoretical framework that try to explain the relationship between these technologies, supply chain responsiveness and firm competitiveness. By adapting and extending past literature and theoretical frameworks done by previous scholars on the supply chain context (Roh et al, 2014, Thatte et al, 2013; Gunasekaran et al 2008; Hayat et al., 2012), the proposed theoretical framework will provide new insight for Malaysia manufacturing firms.

1.6.2 Practical Contribution

The manufacturing sector is one of the major sectors that spur the economy growth of Malaysia which constitutes approximately 25% of Malaysia Gross Domestic Product (GDP). The increasing competition both in the local market and global market has put strong pressure on manufacturing firms to stay competitive and to sustain the challenging market condition.

This study intended to survey the current usage of social media and cloud computing in manufacturing firms and to further explore further potentials of these

technologies in improving supply chain responsiveness and firm competitiveness. Most of the past studies done were to examine social media and cloud computing adoption intention but no studies had been done to investigate actual impact of the usage of these information technologies to firms.

By examining the features of social media and cloud computing, and further matching these features with the enablers of supply chain responsiveness, this study look forward to explore the impact and possibilities of the said technologies in supply chain context. This study could provide managerial insights to industry practitioners who seek to enhance their firm competitiveness by adopting social media and cloud computing. The study also intended to change the perceptions of industry practitioners towards the use of social media and cloud computing in supply chain context and to shed some light on potential ways to apply these technologies in real world business settings, in order for them to harness the true benefits of social media and cloud computing. Practitioners need to know how to translate these benefits into competitive advantage that differentiate them from the competitors. They can make use of the findings and recommendations from this study to formulate viable and strategic plans to enhance their firm competitiveness.

1.6.3 Social Contribution

As one of the driver that stimulates Malaysia economic growth, continuous improvement is vital for manufacturing industries. Besides the contribution of manufacturing industries towards Malaysia GDP, manufacturing industries also generate a lot of job opportunity to Malaysian and help to decrease unemployment rate in the country. According to a report from Department of Statistic Malaysia (as

of December 2012), the total employment offered by manufacturing industries accounted to a whopping 1,998,075 numbers of employee hired in this particular sector.

To remain competitive, the manufacturing industries will need to enhance their business strategy through usage and integration of necessary technologies. Support from all parties and stakeholders, especially from the government are essential. Policy and guidelines should be enacted and strengthened to support the use of social media and cloud computing, especially among SMEs to improve their competitiveness.

1.7 Definition of Key Terms

Social media: "A group of internet-based applications which allow creation and exchange of user generated content, relying on the ideological and technological principals of Web 2.0." (Sun & Shang, 2014; Vuori, 2012; Durkin, McGowan & McKeown, 2013; Badea, 2014)

Cloud computing: "An access of computing resources and services comprise of IT resources, applications and data, storage etc. across a network" (Lu & Teng, 2012; Ahuja & Moore, 2013)

Supply chain responsiveness: "The ability of a network of firms to cost effectively and promptly address to changes in customers' demand or market condition in a competitive environment" (Hayat et al., 2012; Gunasekaran et al., 2008; Thatte et al., 2013)

Operations system responsiveness (OSR): “The ability of a firm’s manufacturing system to address changes in customer demands which includes both manufacturing operations and service operations.” (Thatte et al, 2013)

Logistics Process Responsiveness (LPR): “A firm’s ability in outbound transportation, distribution and also warehousing systems to address demand changes.” (Thatte et al, 2013)

Supplier Network Responsiveness (SNR): “A firm’s major suppliers’ ability to address changes in the firm’s demand.” (Thatte et al, 2013)

Firm Competitiveness: “The capabilities of a firm to profitably meet customers requirements by offering goods and services which customers deemed as higher value than those offered by other competitors.” (Chikán, 2008)

Small and medium size enterprise (SME): “The new definition for small size manufacturing firm endorsed by National SME Development Council was simplified as “sales turnover from RM300, 000 to less than RM15 million or full time employees from 5 to less than 75” whereas medium size manufacturing firm is defined as “sales turnover from RM15 million to not exceeding RM50 million or full time employees from 75 to not exceeding 200.” ” (SME Corp. Malaysia, 2013)

Electrical & electronic (E&E) industry: “The E&E industry in Malaysia can be classified into four sub-sectors namely, electronic components, consumer electronics, industrial electronics, and electrical products.” (Malaysian Investment Development Authority (MIDA), 2015)

Enterprise resource planning systems (ERP): “Extensive software systems that integrate a number of business processes, such as manufacturing, supply chain, sales,

finance, human resources, budgeting, and customer service activities." (Weinrich & Ahmad, 2009)

Technology-organizational-environemnt (TOE) framework: "TOE framework identifies three context groups which consist of technological, organisational, and environmental. The technological context refers to internal and external technologies applicable to the firm. Organisational context refers to several indexes regarding the origination, such as firm size and scope, organizational structure, managerial structure and the quality of human resources. Environmental context refers to a firm's industry, competitors and regulatory environment. The framework explained firm's technological innovation decision making behavior" (Low et al., 2011; Hsu, Ray & Li-Hsieh, 2014)

1.8 Organization of the Remaining Chapters

There were a total of five chapters in this dissertation, consisting of: (1) Introduction, (2) Literature Review, (3) Research methodology, (4) Findings and Analysis, and (5) Conclusion. The first chapter discussed the introduction, background of study, problem statement, research questions, research objectives, significant of study and also definition of key terms. The second chapter presented the literature review of previous studies on social media, cloud computing, supply chain responsiveness and firm competitiveness. Chapter three discussed the research methodology used in this study to investigate the research problems by explaining research design, measures of survey, sampling techniques and research methods. Fourth chapter presented the analytical results of descriptive analysis or statistics, confirmatory factor analysis and structural equation modeling. Finally, the conclusion

drawn from the findings and implications that may bring to the manufacturing industries were presented and discussed in chapter five.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter covered important topics on social media, cloud computing, supply chain responsiveness and firm competitiveness which were related to this study. Past literatures relevant to the study as well as underlying theories and concepts were discussed in this chapter, thus providing a comprehensive overview of literatures being reviewed. The proposed theoretical framework and hypothesis development were presented at the end of the chapter.

2.2 Overview of Manufacturing Industry in Malaysia

Since Malaysia achieved its independence in year 1957, the country has achieve an impressive development in its overall economy, especially in manufacturing industry which is one of the key sector that contributed to the country's economic growth. According to the report done by Department of Statistic Malaysia in year 2014, Gross Domestic Product (GDP) had risen to 6% in year 2014 compared to 4.7% in year 2013. Manufacturing, services and mining & quarrying sectors were the major drivers that stimulate the growth on the supply side. In year 2012, manufacturing industries had contributed 24.20% to Malaysia GDP (Department of Statistic Malaysia, 2012).

Since the early 1980s, the manufacturing industry had been making remarkable growth. In the effort to ensure the success of country's economic, the

country economy has undertaken an economic transition into industrial-based, shifting away from the initial strong dependence on agricultural based. Manufacturing industry in Malaysia include electric and electronics (E&E) industry of non-metallic mineral industry, aerospace industry, textiles and apparels industry, basic metal industry, engineering supporting industries, food industry, sustainable resources (rubber & wood) industry, petroleum and petrochemical industry, machinery and equipment (M&E) industry, medical devices industry, and also pharmaceutical industry.

Manufacturing sector is also one of the several areas being focused heavily in the Ninth Malaysian Plan, which emphasizes the importance of up-scaling manufacturing sectors and related services. According to Department of Statistics Malaysia (2014), manufacturing sector contributed up to RM48.4 billion of GDP by economic activity in quarter 1 year 2014. Further to that, since the amendment of the Investment Act in 1986, significant increase in foreign direct investment into the manufacturing sector has further fuel the growth of Malaysia manufacturing industry. (Mahadevan, 2001)

2.3 Review of Relevant Theories

Theory is important in a research as it helps us to understand the relationship of the dependent and dependant variables. The underlying theory would serve as a basis for measurement and help to test the relations among variables in a study. Relational View theory was the main theory that supported the whole research framework.

2.3.1 Relational View (RV)

Relational View (RV), focuses on interfirm resources and abilities to create competitive advantage while Resource-Based View (RBV) focuses on in-house resources and capabilities that generate a firm's competitive advantage (Dyer & Singh, 1998; Barney, 1991; Sanchez & Schmid, 2013). Built on the RBV, RV explained competitive advantage by considering relationships from partnership or alliance formed by dyads and networks of firms instead of individual firms as unit of analysis (Dyer & Singh, 1998; Chen & Paulraj, 2004; Sanchez & Schmid, 2013). According to Wong (2011), "the relational view of resources-based theory extended the core tenet of RBV by integrating the perspective of RBV and relational network theory to explain how interfirm cooperation can generate sustainable competitive advantage"

Further, RV asserts that firms can enhance their competitive position through interfirm linkage hat allow them to gain access to value creating resources that reside outside the boundaries of the firm. In another word, a firm's competitiveness may extend beyond the boundaries of the firm (Ryman, 1999; Sanders, Autry & Gligor, 2011). Dyer & Singh (1998) further argued that alliance partners who are effective in sharing the knowledge of "know-how" are more likely to create a competitive advantage and outperform other competitors. Similarly, Thomas and Esper (2010) stressed that collaborative behaviours which include sharing of information were sources of competitive advantage. This is consistent to the opinion of authors such as Hayat et al. (2012) Gunasekaran et al. (2008), Thatte et al. (2013) and Roh et al. (2014) who stressed that collaboration and knowledge sharing were important to ensure the responsiveness of supply chain.

"No firm is an island as firms depend on networks" (Gruner, Power, & Bergey, 2013). Collaborations and social networks between firms in supply chain had been