

Article Info

Received: 25 Sept 2016 | Revised Submission: 20 Oct 2016 | Accepted: 28 Nov 2016 | Available Online: 15 Dec 2016

Open Innovation Adoption Strategy Enhancing Performances in Malaysian SMEs

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ABSTRACT

Open innovation model is best suited to SMEs as it complements internal R&D in enhancing performances and cost effectiveness through sustaining or gaining competitive advantage. This conceptual framework looks into the aspect of behavioral and cost to determine the adoption level. Aspect of study includes organizational citizenship behavior, managerial ties, organizational culture, transactional costs and appropriability regime to determine the relationship between these factors in manufacturing environment. OCB moots employees' commitment as they are considered to be the most influential people in any organizations who are able to support innovations. The theories utilized in this research are drawn from multiple theoretical perspectives from Open Innovation theory, Social Exchange Theory and Actor Network theory. Collaboration among all the concerned external parties is crucial for SMEs in supporting innovation. External parties include external firms, R & D organizations and government officials. Organizational culture affects the technology adoption through work practices as well as productivity and therefore management need to inculcate culture that promotes collaborations and supports to expedite open innovation. However the adverse culture may impact adoption negatively. External technology open doors for free riders and therefore protection mechanism must be enhanced through appropriability. Appropriability mechanism is important in protecting the innovative ideas from external parties through intellectual property rights especially in manufacturing sector as it impacts the innovation capabilities and revenues. The aim of the research is to evaluate the open innovation approach for SMEs with respect to the performances and sustaining the innovative development of productions in the long term. Quantitative techniques by adopting Partial Least Squares regression (PLS) utilized to explore the fundamental relationships and analyze linear regression model by projecting the predicted variables and the observable variables. The findings of this study will help SMEs to develop new tools and technologies that are driven by open innovation concept. It also broadens the body of knowledge of open innovation especially in providing new evidence on how performances can be achieved in the long run. From theoretical aspect, this study contributes by exploring the dimensions of various behaviors and providing guidelines to SMEs the behaviors that is positively associated to Open Innovation adoption.

Keywords: Malaysia; Open Innovation; Performances; Productions; Small Medium Industries (SMEs).

1.0 Introduction

SMEs survival depends on how innovative they are and therefore strategies are important because without innovative initiatives SMEs tend to lose their competitive edge especially in developing countries (Abdullah & Manan, 2011, Bhuiyan, 2016 & Damanpour & Aravind 2012). Malaysian government focuses on the development and growth of SMEs in order to achieve the vision 2020 and

SMEs are targeted as they contribute towards employment and income to the country. Even though financial support has been provided to enhance SMEs development and growth, yet their productivity, development and growth has declined over the years. This is due to inefficiencies of SMEs in developing innovative products through innovative processes and gaining production efficiencies. Manufacturing sector is mainly represented by physical transformation of compon-

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ents, chemical and materials into innovative products (SME Corp, 2013). Manufacturing sector has contributed 23.7% of the total SME contribution and 48.5% to GDP and 48.5% of total SME exports (EPU, 2015). However there are many issues faced by SMEs especially lack of innovative products, low productivity, lacking in innovative initiatives and thus unable to compete in national and international markets.

As Malaysian SMEs faces various challenges and concerns such as skilled labour force that has resulted low productivity and low quality output, lack of management skills and expertise, competition from global SMEs especially from China and India and low capabilities to meet the global requirements and standards (SME Corp, 2015).

Manufacturing sector will be able to attract more foreign direct investment (FDI) if SMEs ability to enhance its innovative capabilities to improve its productivity and performances as these will largely depend on growth of this sector (SME Corp, 2015).

In addition SMEs faced by problems in maintaining its quality as well as competitiveness of the products where these requirements are important for SMEs productivity and performances.

As such, the only option for SMEs survival is through knowledge and technology to produce and promote high technological products.

This is in line with current market environment whereby the technology is rapidly developing and with these rapid changes SMEs is lacking creativity, innovation and technology in production processes that impact its productivity (SME Corp, 2015).

The links between MNCs and SMEs is important in creating demand for products but SMEs unable to penetrate it as they are unable to meet the requirements and product standard of MNCs (SME Corp, 2015).

The main reason is that low technology adoption and SMEs unable to take advantages of existing external technologies. This is evident in the case of China where 82% of inputs used in MNCs productions while only 40% of SMEs inputs used by MNCs in Malaysia (EPU, 2015).

Therefore initiatives have to be taken to increase the use of innovation in SMEs to increase efficiencies and have greater excess to markets. In addition, innovation is also crucial in enhancing the

quality of SMI products to expand into regional and global markets. In order to reach the stage, SMEs need to develop its workforce skills and capabilities to adapt changes to adopt innovation in their productions.

Through innovation, SMEs would be able to build up strong partnerships with large companies especially MNCs to match MNCs product quality (SME Corp, 2015). SMEs would be able to supply the innovative products to industries in order to gain access to international market if the plan is successful.

As such SMEs are encouraged by government to undertake innovation initiatives to improvise the processes thus enhancing the products by engaging with internal and external actors to provide solution for manufacturing difficulties. Engaging with relevant actors is crucial to strengthen the collaboration thus reducing overall production costs of R&D and enhancing innovation activities.

The future of SMEs will be shaped by developments in technology and with established players and a strong innovative presence, SMEs able to expand their products to global companies. The issues faced by the Malaysian SMEs are internal and external integration which influences the competencies. SMEs have become important in innovation study because of the flexibility and compatibility of its structures (Kayadibi et al., 2013).

Malaysian government is more interested to implement policies that improves innovation in productions but lacks the empirical work on the factors that determines innovations amongst SMEs. Innovation is important for SMEs and little empirical research has been conducted particularly in Malaysia. Therefore this study will shed some important insights by analysing influential factors that influences innovation adoption as government has taken the initiative in the implementation of innovation strategies.

Companies have to harness innovation talent in their organizations by initiating opportunity to employees to explore their creativity as every employee have their own strength or expertise in their own field.

Therefore, creating an environment of positive attitude towards company will enable the workforce to perform extra role behaviour (Organ 1988).

2.0 Literature Review

2.1 Open innovation

Open innovation is defined as inflow and outflow of knowledge in order to create values in productions (Chesbrough, 2003). Open innovation concept is the use of external knowledge to enhance technology in productions Weiss and Drewry, (2011) by sharing knowledge among various players in the industry (Abouzeedan and Hedner, 2012). In addition, it also improves firms' production performances De Jong et al. (2007) and innovation competence to compete in the industry (Chesbrough, 2003 & Gassmann et al., 2010).

Through open innovation adoption, SMEs able to optimise the usage of technology Haines & Sharif, (2006) as SMEs unable to keep in touch with the latest technology. Open innovation is predicted to be the catalyst for innovation management Chesbrough, (2003), & Lee et al. (2010). Fewer studies have been conducted describing the adoption of open innovation in SMEs (Chesbrough, 2006 & Van de Vrande et al. 2009).

There is lack of studies on open innovation practices in SMEs especially in Malaysia. SMEs lack resources to develop new products internally through closed innovation Van de Vrande et al. (2009). Therefore, the need to collaborate with external parties is a must for SMEs to innovate successfully Rahman & Ramos (2012) as innovation becomes complex and difficult to be manage through closed innovation in the long run (Chesbrough, 2006 & Van de Vrande et al. 2009). This study undertakes to analyse the adoption strategy taken by SMEs to discover the technological learning and performance of SMEs in Malaysia as well as the capabilities of SMEs to adopt open innovation

2.2 Organizational citizenship behavior

OCB is defined as flexible behaviour that is indirectly recognised as formal job duties to enhance functions more effectively. Therefore employee behaviours are crucial in improving the productivity and thus enhancing the performances. Performing specific roles that is associated to innovation Konovsky & Pugh, (1994) but that need the change in employees' behaviour which is not associated with reward (Konovsky & Pugh, 1994). Organizations are unable to function well or survive without any employees

who act as a good citizenship (Markoezy & Xin, 2004). Organizations are unable to function well or survive without any employees who act as a good citizenship (Markoezy & Xin, 2004). Implementation of OCB can be conducted in 5 practices such as altruism, courtesy, conscientiousness, civic virtue and sportsmanship (Robbins and Judge, 2008).

OCB maximizes the efficiencies and productivity of the work force which leads to effectiveness of the productions (Rajabipour, et al. 2010; Doostar et al., 2012). OCB also boosts performances among employees in organisations through use of resources in an efficient manner (Evan, 2006). Innovation is important for SMEs to produce innovative products and therefore employees play crucial role in ensuring the accomplishment of innovative products (Jex 2002).

Capabilities of managers and employee motivation is important to adopt innovation Chesbrough (2003) as these factors tend to influence the open innovation adoption Chesbrough, 2003; Gavetti, 2005; Teece, 2007).

As such, identifying internal factors such as managers and employees contribution in ensuring firms able to adopt open innovation can be analysed through OCB (Lau & Ngo, 2004 and Lichtenthaler, 2011) as behaviour plays significantly in determining the adoption success rate (Lichtenthaler 2011). OCB can also ensure that SMEs able to overcome initial stage problems which is crucial in determining open innovation efforts.

This paper is structured to critically analyse the relationship between OCB of the firm with open innovation adoption.

2.3 Organisational culture

Organizational culture has been identified as one of the main factor that influences knowledge management in any organisations (Ribiere & Sitar 2003). Organisational culture comprises set of ideologies, traditions, values and commitments which are complex that influences organisation conducts (Poskiene 2006).

Understanding the organisational culture is crucial in determining the practice and performance of an organisation as culture allows organisations to build the necessary capabilities which are crucial to successfully adopt innovative practices (Voelpel et al. 2005). Productions need technology and innovation

culture is considered as one of the critical success factor. Successful organisations tend to incorporate innovation into management practices as a form of culture to nurture the levels of creativity and innovation in an organisation (Martins & Terblanche, 2003).

Implementing an innovation culture not necessary will lead to innovation effectiveness but the existence of an innovation culture is important for organisation to make sure that innovation is possible for future growth (Angel, 2006).

However it is argued by few researchers that innovative culture is an important for sustained innovation Poskiene (2006), continuous improvement Kenny and Reedy (2007) and therefore culture of risk taking leads to successful implementation of innovative technology (Pandey and Sharma, 2009).

In addition, another study by Kenny and Reedy, (2007) stated that organisational culture needed to lay the foundation for innovation and the ability to continue the innovation initiatives that will provide competitive advantage to an organisation (Mone et al. 1998 & Zahra et al 1999).

Therefore, this study adopts the concept of culture proposed by Tsui, et al. (2006) which incorporates integrative culture through framework of internal integration and external adaptation such as employee development, harmony, customer orientation and innovation dimensions for open innovation adoption.

Few studies have been undertaken in Malaysian context adopting Tsui et al. (2006) framework for open innovation adoption.

As such, this study validates Tsui et al. (2006) instrument to identify organisational culture configurations for open innovation adoption in the Malaysian businesses especially in SMEs context.

Integrative culture unites employees through promotions and successfully drives their motivation to be involved in the organisation (Chatman & Jehn, 1994).

It is a situation where employees are highly dedicated, performance oriented and spirit of organisational citizenship behaviours.

This paper is structured to critically analyse the relationship between Organisational Culture of the firm with open innovation adoption.

3.0 Managerial Ties

Ties with external parties leads to higher level of operational competency whereby SMEs able to have access to knowledge that leads to innovation incentives and enhancing performances.

Ties with external parties enable managers to gain business performance through responses by external parties to the needs of SMEs. Business ties among managers in organisation enable firms to exchange innovative ideas Hult, et al. (2004) with embracing, exploiting and transforming the external knowledge (Gao, et al., 2008). Stronger ties with large companies such as MNCs who are SMEs customers enable firms to obtain the information needed to develop products (Frambach, et al. 2003 & Narver et al., 2004).

Studies also show that appropriate managerial ties help firms to accomplish innovation goals (Su, Tsang, & Peng, 2009) and enable the execution of open innovation (Chung, 2011).

Various categories of ties have been conducted empirically and theoretically in the field of innovation such as direct ties or indirect ties, formal or informal ties and strong or weak ties (Powell & Grodal, 2005; Soda, 2011). Association with other firms Bizzi, (2013) enables SMEs to gain advantages through flow of information between the networks.

Large number of ties and a main strong tie will provide SMEs a dynamic innovative capability (Capaldo, 2007; Han and Hovav 2013 and van der Leij & Goyal 2011).

Ties are crucial to explore and exploit technologies from external parties to sustain SMEs growth (Jansen et al. 2012).

External party ties would enable firms to have access to knowledge which would lead to innovation initiatives for SMEs operational competency and enhancing performances Llorens et al., (2003) as well as creating market (Demirbag et al., 2006).

This study focusses on ties with other firm managers, government officials and universities and other research institutes (Laursen and Salter, 2004).

This paper is structured to critically analyse the relationship between Managerial Ties of the firm with open innovation adoption.

4.0 Transaction Cost

Transaction Cost Economics (TCE) has impact on the development of organisational innovation processes and practices (Coase, 1937 & Williamson, 1975 and Williamson & winter, 1991). It also explains human and economic behaviour in any organisations whereby it provides the relationship between firms and environments as how resources being used optimally resources. As Chesbrough, (2003) mentioned in their studies that collaboration and opening up the boundaries will lead to various challenges such as an increase in overall transaction costs for firms. External integration helps companies to reduce transaction costs by developing collaborative relationships with external parties (Zhao et al., 2011). Besides production costs, Transaction Cost also involves searching and evaluating costs, negotiating, regulating and administering external parties. Transaction Cost Economics evaluates the managerial and behavioural aspects to facilitate in explaining human action (Williamson, 1975 and Williamson & winter, 1991). Asymmetric information is a constraint for any firms due to parties who are motivated by self-interest with guile (Simon, 1991). Uncertainty in behaviour such as non-trusted and opportunistic parties might increase the overall transaction costs. Transaction costs will increase due to uncertainty in behavioural when dealing with non-trusted, opportunistic internal and external parties in the industry. In order to reduce the transaction costs, controls and enforcement is needed with negotiating parties. Level of asset specificity enables managers to differentiate between in house productions than productions that involve external collaboration (Carter and Geoffrey, 2006). Make or buy decisions (Williamson, 1971 and Wolter & Veloso, 2008) indicate that firms should endorse external technology for productions if transaction costs are low and otherwise when the transaction costs are high. However firms face significant pressure internally or externally to adopt new technology in their productions in order to reduce risk of losing competitive strength but also by taking into account of opportunistic behaviour. In this paper, application of TCE will be examined in a situation where changes occur in an organisation in terms of innovation and whether TCE is applicable in open innovation settings (Chesbrough, 2003&2006). This

paper is structured to critically analyse the relationship between TCE of the firm with open innovation adoption.

5.0 Appropriability Regime

Appropriability Regime is used as a moderator factor in various studies of open innovation but appropriability mechanism used in this study as a moderator between behaviour and cost of manufacturing capabilities and innovation adoption. Various studies also highlighted the positive relationship between behaviour and firm's performance through intellectual property protectionism mechanism (Rodrigues et al., 2004; Frohlich & Westbrook, 2001). Technology transfer needs effective communication as well as knowledge sharing and should be confined to the interested parties. Therefore the innovative knowledge should not be openly available to other parties or spill overs and therefore SMEs need to implement intellectual property rights against any free riders (Seo et al., 2015). The major challenge faced by SMEs are managing and controlling the external knowledge as they lack expertise Seo et al. (2015) and therefore SMEs need to adopt informal forms of protection approaches so that it will be difficult for competitors to access to the knowledge. In order to prevent knowledge spill overs, SMEs have to build time-consuming process to prevent free rider from taking advantages (Nieto 2005 & Norman, 2002). This will ensure SMEs to gain advantages over its competitors through reduction of imitation processes among players in the industry (Holgersson 2013). SMEs should not rely on one type of appropriability regime such as lead time but also engaging in implementing other forms of informal appropriability regime such as design complexity and secrecy to protect the knowledge and the development stages (Arundel, 2001). This study empirically examines the various actors' roles in exploration knowledge capacities for SMEs to enhance performances through the appropriability regime. Therefore, this study is important in adopting appropriability instrument as a form of moderation to explore the capacities of the relationship between organisational citizenship behaviour, organisation culture, managerial ties and transactional costs towards open innovation adoption. This paper is structured to critically analyse the mod-

eration effect between OCB, organisational culture, managerial ties and transaction cost with open innovation adoption. behaviour, organisation culture, managerial ties and transactional costs towards open innovation adoption. This paper is structured to critically analyse the moderation effect between OCB, organisational culture, managerial ties and transaction cost with open innovation adoption.

6.0 Research Methodology

This study selects companies operating in Klang Valley because of SMEs operation that is heavily reliant on MNCs to produce products and innovation is highly needed in such environment. The companies randomly selected based on SME Corp list of companies that uses some form of technology in their productions (SME Corp, 2015). 350 companies will be selected based on 10% population size of 3500 SMEs incorporating medium to high level technology in their production (SME Corp, 2015). The survey form will be delivered to the managers who are in charge in business operations. Purposive sampling will be used to select the companies from the industries such as managers registered with SME Corp and are engaged in high technology, working for at least 5 years' service in the company and have knowledge and involved in innovation practices. All measures used in study were based on 5 point Likert scales that are adopted from various studies proven for reliability and validity tests. The partial least squares procedure (PLS) used to determine the factor loadings to match the number of variables. PLS is used in this study to evaluate the measurement model the relationships between constructs and their corresponding indicators and the structural model with the aim of minimizing the error variance.

7.0 Conclusions

Behavioural factors has positive effects on adoption of open innovation but this has to be guided with transaction costs to reduce production cost as well as appropriability mechanism to protect the new technology being used by free riders and from technology supplier who might want to supply to other players in the industry. The result of this study provides valuable insights into the underlying contextual factors of open innovation adoption

behaviour for researchers and practitioners. The finding will seek to confirm whether consistent with the results of previous studies or other wise and suggestions made to increase the level of open innovation awareness in Malaysian SMEs perspectives. SMEs in Malaysia need to modify and adopt open innovation concept due to advancement of new technologies that is impossible for SMEs to update themselves. In this study establishing collaboration and relationship is critical in boosting SMEs capability and performances in productions. The findings of this study indicate that both behavioural and cost factor could have positive relationships with adoption of open innovation which transforms into firm enhancing performances. The result would suggest SMEs capacity is very important to seek for the most effective way to enhance innovation performance. SMEs should take advantage of the new technology to develop new products and complement existing products which consequently leads to SMEs achieving performances. In addition, the ability to absorb external knowledge is beneficial for SMEs in creating environment of innovation activities.

8.0 Research Implications

This study contributes to the Actor Network Theory (ANT) and Social Exchange Theory (SET) theories by empirically testing the open innovation concept in SMEs innovation in Malaysian perspective.

This study contributes in the form of investigation of the effectiveness of internal and external actors' behaviour in the adoption of open innovation.

The findings would reveal interesting frameworks among various variables included in this study such as organisational citizenship behaviour (OCB), organisational culture (OC), managerial ties (MT) that will enhance the impact of open innovation adoption.

Such a result can reduce transitional cost (TC) by proposing that SMEs acquire the innovative ideas with protectionism through appropriability regime (AR) mechanism. The finding suggests that SMEs need to be committed in innovation initiatives and rely on adopting strategies rather than innovation. Therefore inter-functional coordination within

internal players and between external players will demonstrate the potential influence on firms' innovative behaviour and enhancing performances. Besides employee involvement through OCB and enhancing innovative culture, strong ties with external players' such as other business firms, government and research institutes or universities plays a crucial role in association with innovation, thus reducing transactional costs in SMEs productions. Acknowledging the importance of these factors reshapes SMEs competitive edge in the current business world and this study is evident in identifying the moderating role of appropriability mechanism that links between various factors in innovation adoption. These strategies are important from Malaysian perspective as the country is characterized as collective and relationally cultured in which managers play a crucial role in implementing strategies to adopt open innovation to enhance performances in productions. In addition, managers should increase SMEs spirits and ability to generate creative ideas and introduce innovative ways and means to solve production matters and reduce any forms of disruptions which leads to unproductive atmosphere for innovation adoption. The results of the study will have strong implications for Malaysian SMEs that are already operating or intend to operate using innovative ideas in productions.

8.1 Limitations

Using managers as respondents is vulnerable to bias answers and therefore the sample size should also include other member of the organisations to provide a clear point of view on adoption level. Innovation adoption level should be measured on actual quantitative data in a very large scale to better understand the companies' perceptions towards new innovative ideas.

9.0 Further Research

Further research should be conducted on the same factors but in a bigger sample size to help assess the extent of the phenomenon in the same industry in order to obtain a more comprehensive picture of open innovation adoption. The category of samples should also focus on managers and employees based on age, years of experience and service, technology competence and other data. Researcher should also

consider how to maximize the potential of behavioural factors of OCB, organisation culture and managerial to ultimately have an impact on adopting open innovation. Further research should examine the differences between intelligence levels of workforce, behavioural that influences the culture of innovation acceptance in an organisation. Further study should seek the suitability of open innovation to small companies and how these technologies differ according to the size of the external parties involved. Study should also focus on the magnitude and impact of open innovation threats to smaller firms. Critical study in mitigating risk models should also be considered for open innovation concept

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