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THE IMPACTS OF WIKINOMICS ON OPEN INNOVATION IN ORGANIZATIONS: A STUDY BASED ON SMES IN TAIWAN

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Abstract

Due to the rapid changing environment, shortening product life cycles, and increasing cost of R&D (Research and Development), the company cannot maintain its competitiveness by only relying on its internal R&D capability. Unlike the traditional closed innovation in the enterprise, open innovation and wikinomics have changed the innovation model and create a new way to success. The concepts of open innovation and wikinomics emphasize that the company should cooperate with external organizations to enhance the R&D capability and gain the competitiveness. The goal of this research is to investigate the impacts of organizational wikinomics on open innovation adoption and organizational performance. We applied five constructs to evaluate the organizational wikinomics, including collaboration, openness, interdependence, sharing and integrity. In addition, open innovations are divided into inbound and outbound one, and organizational performance is measured by R&D performance. A quantitative questionnaire survey will be conducted in this research, and SMEs (Small and Medium Enterprises) in Taiwan are selected as the research subjects. The Research results will be helpful to understand how to apply the wikinomic strategies in SMEs to gain open innovations and R&D performance, hence the SMEs can fight with the large companies in the competitive business environment.

Keywords: Wikinomic organization, Open innovation, R&D performance, SMEs.
1 INTRODUCTION

According to the 2011 public annual report released by the Small and Medium Enterprise Administration, Ministry of Economic Affairs in Taiwan, among all the industries, 97.63% of the enterprises are SMEs (Ministry of Economic Affairs, 2012). The data show that the major part of the industrial structure is SMEs in Taiwan. SMEs play an important role in the economy in Taiwan.

As Drucker (1985) said, for an enterprise, in the face of rapid changes in society, economy, and technology and strong competitions in markets, innovation is necessary for sustainable management. The rapid development of APPLE from a small enterprise to a multinational corporation is a good example for making innovation in the new era. It can be seen that innovation is the source and motive power for enterprises to maintain competitiveness. Only through continuous innovation can an enterprise survive in the changing environment.

However, due to the rapid change in technology, decreasing product life cycle, and increasing R&D cost, enterprises with merely innovation by their R&D department can hardly keep up with the rapidly changing industrial environment. Thus, how to combine external resources and make use of them well has become an important issue. Chesbrough (2006) proposed a new concept, open innovation, which believes borders between enterprises should be broken down. An enterprise must cooperate with external partners to make innovation. More and more enterprises are moving to a new innovative business model, which is to cooperate with their partners “from outside in” through the characteristic of openness, and continuously improve their existing products or develop new products by introducing their partners’ innovative ideas and technology. Moreover, they can, “from inside out”, through external strategic alliances, release their internal intellectual properties of rather low uses, so that their creativity, technology, and achievements in R&D can be transferred to their partner enterprisers for more valuable uses, in order to obtain maximum strategic benefits and make money from those intellectual properties.

In the other, the term "wikinomic organization" was proposed with the features of cooperativeness, openness, and sharing (Tapscott & Williams, 2010). It is like Wikipedia, integrating external knowledge to modify the content of the Wikipedia knowledge base. The wikinomic organizations allow external partner’s participation in order to use technology from external resources or to innovate new products, for the purpose of creating the best innovation performance possible for the organization. The properties of SMEs are similar with wikinomic organizations. Compared with large enterprises, SMEs have no abundant funds as supports for R&D and should cooperate with external partners to enhance competitiveness.

SMEs use more non-internal innovation than large enterprises as they expand their technical ability through alliances or networks; in other words, open innovation is not a new concept for SMEs (Edwards et al. 2005; Rothwell 1991). Open innovation is usually used in the early stage of innovation to resolve external technology licensing issues (Vanhaverbeke et al., 2006). However, Lee et al. (2010) and Maula et al. (2006) believed that the dispute regarding the influence of enterprise scale on innovation effectiveness is still ongoing, and it is worthy to explore the uniqueness of SMEs in the aspect of open innovation.

Based on the wikinomic organization properties of SMEs, in this research, we will explore whether the wikinomics has any influence on the adoption of open innovation, and whether the adoption of open innovation have any influence on their R&D performance. Based on the above research background and motivation, the research purposes of this study are summarized below:

(1) To explore the wikinomic organizational properties of SMEs;

(2) To explore the influence of SMEs’ wikinomic properties on their adoption of open innovation;

(3) To explore the influence of SMEs’ adoption of open innovation on their R&D performance.
2 THEORETICAL BACKGROUND AND HYPOTHESES

As wikinomics is a new paradigm for SMEs, the openness and collaboration among SMEs are getting more and more important for SMEs. Therefore, open innovation is expected to be the mediation role between wikinomics and R&D performance of SMEs. To investigate the relationships among wikinomics, open innovations and R&D performance in organizations, we will conduct a research model based on empirical survey. Below we examine the extant literature in support of our research hypotheses.

2.1 Wikinomic Organization

Wikinomics is proposed based on four notions, includes openness, peering, sharing, and acting globally (Tapscott & Williams, 2010). The major concept of wikinomics is mass collaboration among enterprises in a business environment. By the collaboration strategy to enhance their competitive capabilities, therefore, the smaller enterprise can survive and fight with the larger one. Tapscott and Williams (2010) proposed five major fundamental principles of the operation of a wikinomic organization, which are collaboration, openness, sharing, integrity, and interdependence. For a wikinomic organization to successfully achieve the goal of group cooperation and create competition advantages for the organization, these five strategic principles must be implemented. We introduced the five major principles and integrated other related literature are illustrated below:

2.1.1 Collaboration

To run a wikinomic organization successfully, the first principle to be implemented is the collaboration principle. Only when organizations can collaborate, the expected goals of wikinomics can be achieved (Tapscott and Williams, 2010). In a collaborative relationship between organizations, interdependence between the organizations is of great importance. The collaboration must be based on resources of similar or complementary properties to achieve the expected result of benefiting each other (Anderson and Narus, 1990). For organizations to collaborate, they must have the intention to do so (Ring & Van de Ven, 1992), and exchange technology and resources through coordination with two or more individual organizations to complete a certain project and achieve their strategic goal(s) (Dussauge et al., 2000).

2.1.2 Openness

Openness means revealing internal information to other organizations or stakeholders. Openness is also one of the required principles for a wikinomic organization. Openness of an organization helps to make its collaboration with others easier. In addition, nowadays internet applications are highly developed. The world has become more transparent. Information regarding the actual values of products or services which customers could not retrieve in the past can now be retrieved easily through the internet. In other words, traditional information closure is now meaningless. On the contrary, openness of information is the only way to win potential partners’ trust and built more productive relationships (Tapscott and Williams, 2010). Openness can be seen as an organizational climate, which may influence the organization’s innovative activities. The climate of an organization with the ability to innovate must be open and active. This kind of organization climate helps to guide the organization’s internal activities to develop toward a direction with more innovation. The organization must enhance this climate through an incentive system (Saleh and Wang, 1993).

2.1.3 Sharing

Sharing is different from openness. Sharing indicates to allow partners to use valuable knowledge assets owned by the organization, such as patent and copyright, through release or authorization, so
that the organization and its partners can use these resources together. The traditional way of strictly protecting knowledge assets is not applicable, for this way may limit the possibility of creating other values using the knowledge assets (Tapscott and Williams, 2010). Nowadays, in the economic environment of strong competitions, cross-organization collaboration has become an inevitable trend. Many of competitions between/among enterprises are not competitions with merely one company, but competitions with all the suppliers in a supply chain. This fact also facilitates knowledge exchange between enterprises and even establishment of R&D alliances. Thus, sharing has become one of the principles for the operation of a wikinomic enterprise.

When knowledge is transferred or disseminated to another person, group, or organization from a person, group, or organization with at least two subjects in the process, one knowledge owner and one knowledge receiver, the communication behaviour between these two subjects is knowledge sharing (Hendriks, 1999). Wikinomic organizations can maximize the use of the knowledge assets they own through knowledge sharing with other organizations, to achieve the goal of improving their competitiveness.

2.1.4 Integrity

In the recent years, promoters of corporate social responsibility have proposed a saying, “do well by doing good”, to guide entrepreneurs to implement integrity in their organizations. The motivations which drive enterprises and organizations to show behaviors of integrity are from not only their shareholders or authority, but also a force of the internet age, which requires them to be more transparent. Compared with the situation in the early days, nowadays enterprises are more likely to be disclosed if they have done something violating integrity and serious damage may be therefore caused. If organizations’ behaviors of cooperation are based on a culture of integrity, promotion of collaboration can become more efficient. In the age of the internet being very popular and information being transparent, the culture of integrity in enterprises and organizations can not only create a complete and sound environment for business operations, but also help them to increase their advantages in competitions and achieve the goal of sustainable management (Tapscott & Williams, 2010).

2.1.5 Interdependence

The modern organization theory has already changed from a close-system theory to an open-system theory. According to the viewpoint of the open-system theory, the development and existence of an organization are closely related to the external environment. The organization must depend on the resources, technology, information, and manpower provided by the external environment to survive (Richard, 1987). The wikinomics theory also believes that nowadays organizations cannot survive by themselves. They have to depend on the collaboration between organizations to achieve the goal of sustainable management (Tapscott & Williams, 2010).

Interdependence means that organizations maintain a relationship between them, so that they can depend on each other to carry out their own or common goal(s) (Emerson, 1962). If a huge part of the sales of an organization is from its partners, it means this organization is highly dependent on its partners (Dwyer et al., 1987). Cases of high dependence are usually related to certain investment items or cases in which the cost to replace current partners is very high. In these cases, both sides have a very high sense of interdependence in their current cooperation (Frazier et al., 1989). Anderson and Narus (1990) believed that interdependence of organizations is based on their interactions. In other words, considering merely one organization’s dependence on the other is not enough to completely illustrate their situation of interactions. Between partners, there are trust, interdependence, and sharing of common goals, which lead to better living conditions than when there is only a customer relationship between them (Sprague & McNurlin, 1993). Organizations are closer when the interdependence between them is higher. This interdependence usually becomes collaboration (Skinner et al., 1992).
According to the literature mentioned above, in an open environment of strong competitions and rapid changes, it is impossible for an organization to fight alone. It needs technology and resources provided by external environments through collaboration, so that it and its partners can depend on and work with each other to achieve their goal(s) together (Tapscott and Williams, 2010).

This research is conducted based on the five major principles for the operation of a wikinomic organization, collaboration, openness, sharing, integrity, and interdependence, proposed by Tapscott and Williams (2010), and performs a broader literature review for each of the principles. In the age of rapid changes, enterprises must cooperate with other organizations to survive in this very competitive environment. Especially, SMEs’ resources are relatively insufficient. They should follow the operational principles of a wikinomic organization to collaborate with external partners based on integrity, depend on each other, open up information, and share their internal and external information, knowledge, and technology with each other, so that they can maintain their competitiveness and create group performances.

2.2 Open Innovation

In the wikinomics, the organizations open and collaborate with each others to create innovate ideas or products. That is, the innovations can be the consequences of the organization which adopt the wikinomic strategy. Innovation is a critical issue to the enterprise’s competitiveness. Innovation can be a new product, a new service, a new technology, a new manufacturing procedure, or a new management method. Bharadwaj (2000) assumed the invention as the new concepts formed in the products or procedures, and innovation is the introduction of the new products, services or the manufacturing processes to the market.

In organizational innovation research, Chesbrough (2003) assumed that an enterprise should make good use of external knowledge and innovative resources, combine external and internal creativity, promote the development of the new technology, and grant external resource higher values. This strategy is named as open innovation. With the enterprises in the past, the innovation strategy adopted belongs to closed innovation. Internal researchers created the main inventions. They had the R&D department, and knew how to turn creative ideas into practically specific products and services. Nowadays, because of the increasing in the mobility of knowledge workers, the utilization of external suppliers, and the global division and cooperation, the traditional closed innovation is transferred to the model of open innovation. It is expected that the outputs of the new products/services could be obtained through the cooperation of the external units in order to create high values for the enterprises efficiently. It has become the new opportunity for making profits in an organization. Moreover, open innovation is classified into inbound and outbound types. Inbound open innovation indicates the outside-in flow of innovative ideas and knowledge from external bodies, while the outbound one is the inside-out flow of an organization’s innovative ideas and knowledge to external bodies.

With the model of open innovation, it is mainly a key factor that enterprises and their partners have to trust each other. Essentially, openness is to redefine the competitive boundary of enterprises, to introduce innovation into the market from the aspect of an integrator instead of an owner, and to gain rewards of commodification from the market. In the model of open innovation, the enterprises can interact mutually with the external market, sell freely their technology, authorize the intellectual rights and apply the copyrights from outside the organization. By enhancing the interaction with external partners, not only the enterprises can achieve better performances in current markets, but also they open up the development of new business and broaden the sources of revenue for the enterprises (Chesbrough, 2003; Chesbrough & Crowther, 2006). West et al. (2014) propose a great review of open innovation literatures in the past decade. The theme of linkage between open innovation and organizational management and economics has been pointed out. That also means that open innovation has played an important role in modern business management.
In our research, we are interested in the issue of wikinomics in SMEs. As the discussion above, inbound and outbound open would be the consequent results of wikinomics. Hence, we propose the following two related hypotheses:

\[ H1: \text{Higher level of wikinomics will lead to greater inbound open innovation in SMEs.} \]

\[ H2: \text{Higher level of wikinomics will lead to greater inbound open innovation in SMEs.} \]

2.3 R&D Performance

In our research, organizational R&D performance is treated as a consequence of open innovation. The R&D capability of new product is considered as one of the key factors of an enterprise’s advantages in competitions and better capability to make profits (Wheelwright, 1992). Many of the studies regarding new product development focus on the discussion or evaluation of the performance construct of enterprises’ new product development (Terwiesch & Loch, 1998). There are a lot of indicators used to evaluate new product development. Generally, they can be categorized into financial indicators and non-financial ones. For examples, Both Kessler and Chakrabarti (1996) and Terwiesch and Loch (1998) believed that the three perspectives which are of the highest influences on evaluation of new product development and most widely accepted are development duration, development cost, and development quality. Gupta et al. (1992) suggested that the three key factors in the process of developing a new product are: development schedule, development cost, and product performance specification.

As the discussions above, R&D performance is important to evaluate the success of innovations. Hence, we propose the following two related hypotheses:

\[ H3: \text{Higher level of inbound open innovation will lead to greater R&D performance in SMEs.} \]

\[ H4: \text{Higher level of outbound open innovation will lead to greater R&D performance in SMEs.} \]

3 RESEARCH MODEL AND METHODOLOGY

3.1 Research Model

Based on our literature review in the previous section, our research model includes three major constructs, including wikinomic organizations, open innovations and R&D performance. The wikinomic organizations is measured by the five principles, includes collaboration, openness, sharing, integrity, and interdependence. In the other, the open innovation is divided into inbound and outbound ones. The research model is shown in Figure 1.
3.2 Operational Definitions of Research Constructs
We adapted measurements from existing literature when available, while others were developed for this research. All items will be measured by Likert scale. The references and measurement items are shown in Table 1.

<table>
<thead>
<tr>
<th>Construct</th>
<th>References</th>
<th>Measurement Items</th>
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| Wikinomics-Collaboration   | Muscio (2007)       | 1. Your company and its partners have a common operation goal, and collaboration helps to achieve that goal.  
2. Your company and its partners make plans together for future competition strategies.  
3. Your company and its partners provide each other professional technical support. |
| Wikinomics-Openness        | Tapscott and Williams (2010) | 1. Disclosing and sharing information with partners helps to improve your company’s and its partners’ competitiveness.  
2. Disclosing and sharing information with partners helps to improve the efficiency of the collaboration between your company’s and its partners.  
3. Your company keeps an open attitude toward sharing information with its partners. |
| Wikinomics-Sharing         | Bock et al. (2005)  | 1. Your company shares success and failure cases with its partners.  
2. Your company shares experiences it has accumulated in business operations with its partners.  
3. Your company shares professional knowledge it has obtained from business operations with its partners. |
| Wikinomics-Integrity       | Tapscott and Williams (2010) | 1. Your company’s rules and regulations are all established according to the law and implemented practically.  
2. Your company’s financial reports are all true and can reflect the company’s actual situations.  
3. Your company can operate and manage its business based on the value of integrity to create a high-quality organizational culture. |
| Wikinomics-Interdependence | Ryu et al. (2007)   | 1. The resources provided to your company by external partners are very important to your company.  
2. The partnerships with partners help your company to increase sales or reduce costs.  
3. Your company can hardly find any replacement for the current external partners. |
| Inbound Open Innovation    | Hung and Chiang (2010) | 1. Your company would actively contact and introduce various innovative R&D resources (e.g. patent, intellectual property, and professional knowledge/technology) from the outside.  
2. Your company cares about the values of external innovative R&D resources in the market.  
3. Your company would actively integrate innovative R&D resources from external partners. |
| Outbound Open Innovation   | Hung and Chiang (2010) | 1. Your company would license the innovative R&D resources it owns to external partners.  
2. Your company would provide suggestions regarding innovative R&D to external partners.  
3. Your company would actively collaborate with external partners to develop new products/services together based on its own innovative R&D resources. |
| R&D Performance            | Chen et al. (2006)  | 1. Your company’s achievement in the output of its investment is better than its competitors.  
2. Your company’s speed of developing a new product/service is faster than its main competitors’.  
3. Your company’s capability of improving functions or quality of its product/service is better than its competitors’. |

Table 1. Research Constructs and Measurements.
3.3 Data Collection and Instrument Evaluation

Our surveys will be conducted in Taiwan. The sampling frame will be the SMEs in the database of the Ministry of Economic Affairs. In order to ensure accuracy and reliability of our survey instruments, we will undertake the following two steps. First, we will invite experts to verify content validity of the research model and the survey items in the questionnaire. Unclear and inappropriate words will be revised for ease of respondents’ understanding. Second, we will conduct a pilot study to check for appropriateness of survey design.

4. DISCUSSION

The purpose of this research-in-progress paper is to investigate how the principles of wikinomic organizations would influence R&D performance and to examine the mediation of open innovations in SMEs. We have developed the research model and measurement scales based on literature review. As the product/service is changing rapidly and the business environment is getting more and more competitive, the company should develop innovative product/service in a short time. Due to the limitations of resources of the SMEs, to collaborate with external partners is necessary to maintain their competitiveness. The wikinomics and open innovations provide the new perspectives to SMEs to make their business strategies. The findings of this research will shed light on how wikinomic organizations would lead to the adoption of open innovations and R&D performance, and will be beneficial to the SMEs.

References


