

Chapter 5

Discussion, Conclusion, and Future Works

5.1 Discussion

As stated in Oslo Manual 2005 (OECD, 2005), factors that hamper innovation activities are as follows.

a) Cost factors: Excessive perceived risk, Cost too high, lack of funds within the enterprises, lack of finance from sources outside the enterprises: venture capital, public sources of funding

b) Knowledge factors: insufficient innovation potential e.g. research and development, design, lack of qualified personnel, lack of information on technology, lack of information in market, deficiencies in the availability of external services, difficulty in finding co-operation partners for product or process development and marketing partnership, organizational rigidities within the enterprise including attitude of staffs towards change, managerial structure of enterprise

c) Market focus: uncertain demand for innovative goods and services, potential market dominated by established enterprises

d) Institutional factors: lack of infrastructure, weakness of property rights, legislation, regulations, standard, taxation

e) Other reasons for not innovating: no need to innovate due to earlier innovation, need because of lack of demand for innovations

The factors mentioned above are for all enterprises regardless the size of businesses. Innovation activities may be hampered by a number of factors. There may be reasons for not starting innovation activities at all, or factors that make innovation activities slow or that have a negative effect on expected results. These include economic factors, such as high costs or lack of demand, enterprise factors,

such as a lack of skilled personnel or knowledge, and legal factors, such as regulations.

Based on our findings in the study, SMEs identify a lack of available finance and knowledge as important barrier to investments in innovation. This corresponds with the list of factors considered to act as barriers to innovation generation explained in Oslo Manual.

As described by Oslo Manual (OECD, 2005), it is necessary for SMEs to be more specialization in their activities. This results in the increase of the importance of efficient interaction with other firms and public research institutions for R&D, exchange of knowledge and, potentially for commercialization and marketing activities. Financial factor can be a determining factor for innovation generation in SMEs, which often lack internal funds to conduct innovation projects and have much more difficulty to access external funding than larger firms.

However, it should be noted that, based on Oslo Manual (OECD, 2005), an innovation is defined as the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations. By the Oslo-Manual definition, “commercialization” is not included. Innovation activities vary greatly in their nature from firm to firm. Some firms engage in well-defined innovation project, such as the development and introduction of a new product, whereas others primarily make continuous improvements to their products, processes and operations. Both types of firms can be innovative: an innovation can consist of the implementation of a single significant change, or of a series of smaller incremental changes that together constitute a significant change.

Interestingly, the findings regarding innovation generation in SMEs from the present study are in good agreement with those of Oslo Manual, though the approach that leads to the new knowledge in this study is different from those used in the Oslo Manual. The interaction with other firms (Oslo Manual) implies business network

(present study) and public research institutions for R&D (Oslo Manual) implies lack of knowledge (present study), exchange of knowledge (Oslo Manual) implies knowledge sharing (present study) and, potentially, for commercialization and marketing activities (Oslo Manual) represents commercialization (present study). Financial factor (Oslo Manual) can be a determining factor for innovation generation implies lack of funds (present study).

Scholars have noted that SMEs are often more fertile than larger firms in terms of innovation (Afuah, 1998). SMEs' comparative advantages over large firms in innovation are flexibility and speed of response. (Acs and Audretsch, 1990; Dodgeson, 1993). As a result, SMEs generally make a valuable economic and social contribution because of their innovative capacities (Lin and Chen, 2007). However, the "how to generate innovation at firm level of SMEs" has been ignored in the past literature. The how-to issue is not at all addressed in Oslo Manual and thus it is considered less useful for the realization of innovation. This is a key contribution from the present study.

It is believed that leader and leadership play an important role to the SME viability. The results from this research have verified such a belief. The elements in the model of innovation generation reveal that among 17 elements thereof 11 elements correspond to the leadership characteristics. Moreover, these 11 elements signify the leader characteristics that are the necessary conditions for the generation of SME innovation. The 11 elements include skill in selecting workers, habit of perpetual learning, ability in vision conceiving, ability in effective communication to staffs, commitment, way of treating workers like family members, coaching ability, knowledge sharing, motivating staffs through rewarding, executing by taking risks, having creativity and differentiation ability.

The Baldrige criteria for performance excellence provide a systems perspective for understanding performance management. They reflect validated, leading-edge management practices against which an organization can measure itself.

With their acceptance nationally and internationally as the model for performance excellence, the criteria represent a common language for communication among organizations for sharing best practices. The criteria are also the basis for the Malcolm Baldrige National Quality Award process.

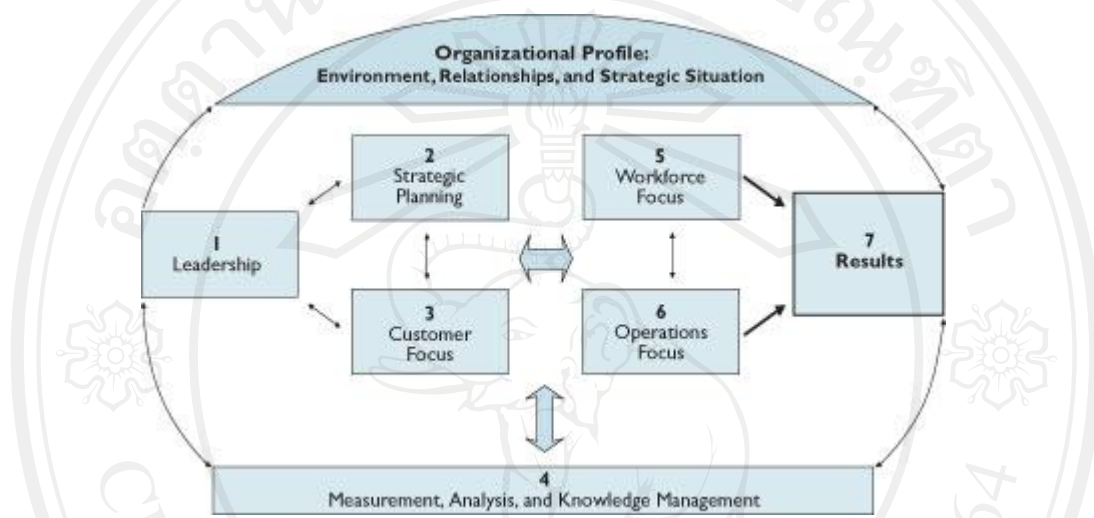


Figure 5.1 Baldrige criteria for performance excellence framework
([http:// www.baldrige.org](http://www.baldrige.org))

The Leadership category examines how organization's senior leaders' personal actions guide and sustain organization. The leadership is thus considered as a key factor according to the Baldrige criteria.

In view of scholars with respect to the influence of leadership on innovation, A review shows that the ability of leaders to encourage creativity and innovation was dependent not only the situation at hand but also on certain characteristics of the leader (Mumford et al., 2002). In particular, they argued that to lead creative efforts, people must possess (a) substantial technical and professional expertise and (b) substantial creative thinking skills. This corresponds to "Business Competency" and "Entrepreneurial Mindset of Owners and Workers" from this research.

One critical component of creative thought within the model of Mumford, Connelly, and Gaddis (Mumford et al. 2003), is the standard that both stimulate creative thought and shape the nature of leader's creative efforts. They present a model of how leaders think about problems calling for creative cognition. It is argued that creative thought on the part of leaders begin with evaluation – specifically the evaluation of followers' ideas. The evaluation, in turn, stimulates a conceptual combination process, the basis for idea generation, where follower ideas are reshaped and reformed based on the leader's expertise and his/her professional and organizational experiences (Mumford and Licuanan, 2004). All of these arguments are in line with the element “Culture: freedom and fun atmosphere and motivation by rewarding” from the present study.

Sternberg, Kaufman, and Pertz (Sternberg et al., 2003) point out that the leader's motivation to innovation and the kind of innovations they are willing to pursue are dependent on strategic choices made by leaders and their perceptions of environmental risks and opportunities. This corresponds with knowledge map “Entrepreneurial Mindset of Owners and Workers”.

Finally, Mumford and Licuanan (Mumford and Licuanan, 2004) concludes in their work that it is necessary to begin to develop new, more complex and more comprehensive models of leader influence, which take into account the unique nature of creative people and creative work in organization. To the present knowledge and information of the researcher, there is no comprehensive leadership model more than those in the literature. The leader characteristics that foster innovation generation in SMEs from the present study are not only in good agreement with the above-mentioned literature, but are also more comprehensive.

In combination with the findings from this study, the Baldrige criteria framework, and the literature on leadership towards innovation, it is possible to propose the criteria of excellent leadership in innovation generation. Accordingly, it should comprise the found 11 elements.

Apart from the leadership issue, comparing to a similar work by (Bernstein and Singh, 2008) where the innovation generation process is studied, it is found that their work examine the social and behavioral actions, activities and practices in order to group them together to create behavior-based profiles that characterize the various stages of the innovation generation processes within organizations. However, it is not mentioned the innovation is generated. Nevertheless, there are some similar issues between their work and the present study. For each type of behavior-based profile, there are some common characteristics. These include creative culture, risk-taking attitude, spirit of entrepreneurship, open-mindedness, lack of formal control, receptivity to ideas, early orientation towards market/customer concerns, need for higher intensity of market/customer engagement, worried about financial and other risks.

Another comparison to the work by (Nauwelaers & Wintjes 2002), it is reported that the obstacles against SME innovation are a limited resource base, a distinctive organizational culture linked to the proximity between ownership and management, and a lower ability to shape their external environment. Consequently, there is a need to increase the availability of external resources for SMEs and to develop their internal absorptive and learning capacities. According to the study, they need five following innovation supports – finance, technology, human resources, openness and learning attitude, and strategy and organization. All of the reported findings are in good agreement with the present study too.

In terms of knowledge evolution, the derived model in this study is in the line of the SECI model. However, the innovation generation in SMEs does not follow the spiral consequence in the SECI model. For examples, the leaders may acquire their new knowledge from reading and crystallizing their ideas by themselves. Afterwards, the leaders transfer their tacit knowledge to the explicit knowledge in terms of written guidelines or commands. This means that the process proceeds from I to E directly, bypassing S and C. Therefore, the consequence of innovation generation in each SME is not necessary to be identical.

It is noticed also that some elements in the model of innovation generation are obviously related to creativity, and some to commercialization. Those relevant to the creativity include freedom and fun atmosphere, creativity and differentiation. The ones that are related to commercialization are business opportunity, execution by taking risks, and business networks.

On closure of the discussion, it is difficult or even not possible, especially in the SME context, to generate innovation when following the previous research. On contrary, the present work makes the generation of innovation readily. It is interesting from the study results that the innovation generation can be described in a concise form of knowledge map by using the knowledge engineering tool, namely CommonKADS. The innovation generation model in terms of knowledge map shows high potential of applicability and realization.

5.2 Conclusions

From the present study, the follow conclusions can be made:

1. A knowledge management-based methodology, namely CommonKADS is employed for deriving the SME innovation generation model.
2. The configuration design template from CommonKADS has been utilized for the purpose.
3. The SME innovation generation model can be compactly represented by a knowledge map.
4. The derived SME innovation generation model is at the level of practice and thus readily for being implemented by SME entrepreneurs. This practical issue has not at all been addressed by the previous literature including the Oslo Manual.
5. The obtained model reveals the necessary practice elements in fostering innovation generation, the constraints prohibiting innovation generation and solutions to them, the indicators of innovation occurrences, and a list of remedy actions when failing to generate innovation.
6. The derived innovation generation model also points out the desired characteristics of SME leaders that promote innovation generation. The leadership

characteristics from the present study are readily to be used as criteria of excellent leadership in innovation generation according to the Baldrige criteria framework.

5.3 Future Works

The derived SME innovation generation model reveals the fundamental practice elements that foster the generation of innovation. It also covers the constraints prohibiting innovation generation and solutions to them, the indicators of innovation occurrences, and a list of remedy actions when failing to generate innovation. It is expected that these practice elements will be further employed for the quantitative justification of the innovation occurrence. This quantitative justification requires future studies and is foreseen to be beneficial for the investment and/or support any SME.