Frugal Innovation: A Case Study of Internet Based Customization Implementation in Small and Medium Enterprises

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Abstract. Value enhancement is a fundamental key in product innovation principle. It defines the degree of a new innovation, from simple idea to breakthrough invention. Frugal innovation is a new term refers to a simple innovation that gives a big improvement in the value of products and or services. This paper discusses a case study of frugal innovation in small and medium enterprises (SMEs) by introducing internet-based customization in value creation. Fifty SMEs in Yogyakarta Indonesia were incorporated representing four areas of creative industries including souvenir, leather, fashion and accessories. Three factors were considered in i.e. customer response, manufacturer capability and engineering constraint. Closed and open questionnaires were employed to evaluate the response of customers while expert justification was used to examine the rests. Based on the evaluation it is concluded that in general, there is a very big opportunity to implement internet-based customization in SMEs in order to improve its value.

Keywords: frugal innovation, SME, customization, value enhancement

1. INTRODUCTION

In these recent years, small and middle scale enterprises (SMEs) are getting much attention from governments as well as from private sectors. It is arguable that they play significant roles in economic growth of many countries including Indonesia. In Netherland, for example, more than 90% of industries are small and middle scale. About 35 million USD can be generated by Italia a year from exporting products of small and middle scale industries which employ more than 2.2 million employees (Abel-Koch, et al., 2015). Vietnam shows that more than 64% of employees are engaged by these industries (Tran, Lee, & Nguyen, 2007). According to Indonesian Centre of Statistics Bureau (BPS), the number of employees in Indonesia working in small and middle scale industries is around 79.6 million.

Even though they play strategic roles in economic growth, due to the global competition, small and middle scale industries are facing a lot of problems when they have to compete with big or modern companies. Due to the growing competition and increasing customer requirements, investment in advanced technologies is necessary for survival (Ordoobadi, 2006). Innovation and adoption of advanced technologies are crucial factors for manufacturing firms today especially for which have not established formal processes for research and development (Wallsten, 1998). In Indonesia, many small industries are still using traditional manners in all aspects of production processes as well as marketing and finance. As a result, it is quite difficult for them to compete with the modern ones.

The market competition is becoming more difficult in this current globalization era, due to the advancement of internet and communication technology. Digital era has changed various conventional ways and approaches in many areas. It has been clearly witnessed that traditional economic system is started to be replaced by new internet-based economic system. This paradigm should be taken into account and innovation is a must for better survival.

There is no single definition of innovation agreed upon by researchers. Innovation often refers to the application of better solutions that meet new requirements and needs (Maryville, 1992), or something original and more effective that breaks into the market or society

(Frankelius, 2009). Innovation is related to, but not the same as, invention (Kim, 2012).

For many big companies, innovation is part of their main activities, but for SMEs, innovation is a dilemma, especially when it needs costly investment. Hence, it is very important to introduce a new model of innovation that is suitable for SMEs to implement. The innovation should be frugal, that is inexpensive but gives big impact to the value of products or services.

This paper tries to formulate a frugal innovation by analyzing the characteristic of the SMEs, used later to find a suitable model of innovation for them. Recommendation is then proposed based on the analyses and discussions.

2. CAPTURING THE GENERAL PICTURE OF INDONESIAN SMEs

The characteristics of small industries in Indonesia are quite interesting. The initial research has been conducted in Yogyakarta Special Region, the best representative of SMEs area in Indonesia, incorporated fifty SMEs in four areas of creative industries including souvenir, leather, fashion and accessories.

The owners' and employees educational backgrounds can be seen in figure 1 and figure 2. Only 11% of the owners and 1% of the employees have the background of undergraduates. Most of the owners are from senior high school while most of the employees are from junior high school and elementary school.

Even though the enterprises have been aged enough (see figure 3), from direct observation and interviews it is found that most of them are still using traditional methods, hereditary with small innovations only. The sources of innovations are mostly from customers and competitors while the role of government and universities were identified less (figure 4). In addition, services and training provided by government and universities were mostly legal-related aspects not directly associated to the product and technology development (figure 5).

In term of investments, most the owners use their self funding and bank loan to run the firms. Government financial aids and third party funding are recognized not so significant (figure 6). Due to the culture, the cooperation among the SMEs is quite strong. Regular meetings to discuss the problem faced and to promote mutually product marketing, raw material purchasing and product design development are usually held monthly together with a kind of lucky draw game called 'arisan'. Figure 7 shows the type of cooperation among small industries.

The reasons for not using new technology are summarized in figure 8. Most of small industries are not interested to use new technology because they do not feel having problems in using traditional manners. Their simple thought 'alon-alon waton klakon' –translated literally as 'slow but sure'- may have significant role in this issue. Educational background of the owners is also considered as another reason. In contrary, when the manufacturers want to use new technology, high cost investment comes as a main barrier. This is definitely true since most of them are using their self-funding as asset. Hence, access to investor is needed to encourage the development of small industries. Marketing initiatives should be also considered since it is found that the source of innovations are customers and competitors.

The aforementioned characteristics of SMEs in Yogyakarta Indonesia gives a brief picture that human resources, marketing initiatives and access to investors are three main problems faced by small industries to adopt modern technology. The roles of government, universities and investors are needed to overcome these issues as there is a great opportunity to develop the small industries considering the fact that even though the education background of owners and employee are not high enough; they have proven their existence by giving significant roles in economic development. The good cooperation among small industries is another important factor to be considered.

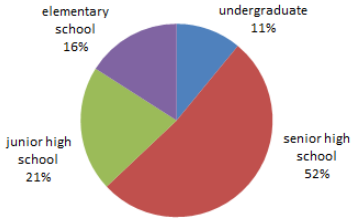

Figure 1. Educational backgrounds of the owners

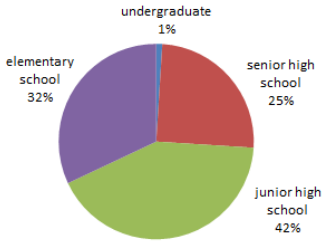

Figure 2. Educational backgrounds of the employees

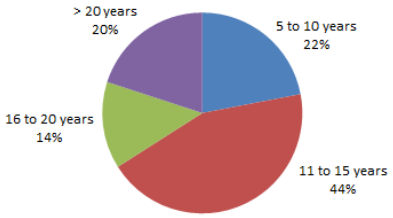

Figure 3. The ages of enterprises

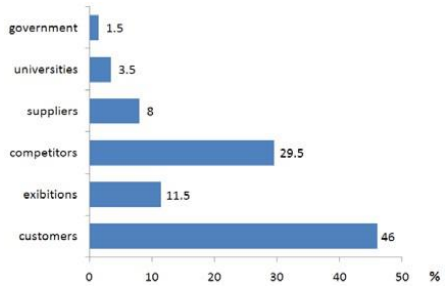

Figure 4. Sources of technology innovations

Figure 5. Services provided by government and universities

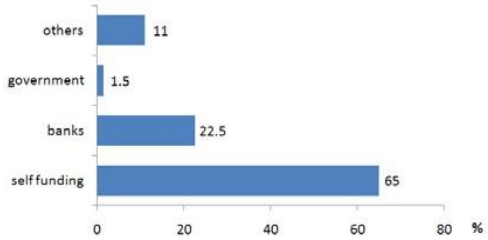

Figure 6. Sources of investment

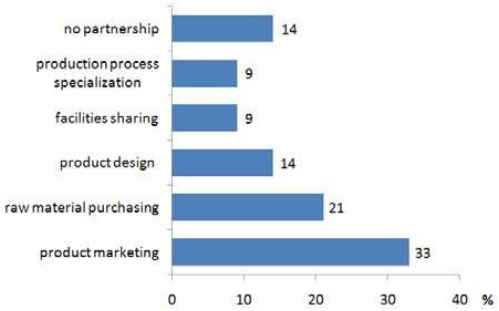

Figure 7. Type of cooperation

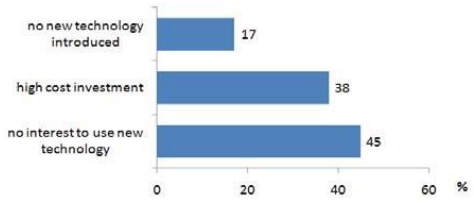

Figure 8. Reasons for not using new technology

3. INNOVATION STRATEGY

The basic principle of innovation is how to increase the value of a product. If the value does not increase, the product will die. In many cases, the value is usually defined by using a simple formula as follows:

$$Value = \frac{Functionality}{Cost} \quad (1)$$

Based on the equation (1), there are several ways to improve the value, including:

- Increase the functionality and reduce the cost
- Increase the functionality and keep the cost
- Keep the functionality and reduce the cost
- Increase the cost slightly and increase the functionality more.
- Reduce the functionality slightly and reduce the cost more.

3.1 Frugal Innovation

Frugal refers to economical, simple, costing little, entailing little expense, requiring few resources and not wasteful. Hence frugal innovation can be defined as a new solution or approach to increase value as much as possible by providing investment as small as possible.

Successful innovation usually starts with choosing best MPVs (Main Parameter Values) of the product. MPVs define the most important parameters that used as reasons why customers purchase the product. MPVs can be derived from three design dimensions (utility, kinesthetic and visual) or from other dimensions outside the product (emotion, social aspect, etc.).

MPVs of creative products (souvenir, leather, fashion and accessories) made by Indonesian SMEs investigated in this research include uniqueness and remembrance. Most of customers purchase the products due to their unique designs that are very worthy to keep as tokens of visiting Yogyakarta.

3.2 Customization as a Frugal Innovation for SME

Customization is not new term in production process. In contrast to mass production which uses voice of majority to make a single standard product, customization enables customers to involve in the value chain to create their own products based on their personal preferences (Pine, 1993). These concepts have been successfully implemented in many areas (Tseng and Jiao, 1996).

Based on the characteristics of SMEs and the strategies of innovation discussed previously, customization might be good candidate for frugal innovation to improve the bargaining position of SMEs in the area of creative industry. For SME, customization does not fundamentally change the production processes, does not need big investment, but it significantly can improve the value of product by introducing new MPVs.

In many cases, customization is able to turn the weaknesses of conventional method adopted by SMEs into strengths. For example, compared to automation, conventional method cannot compete in speed and homogeneity. This weakness is strength in customization as in contrast, homogeneity is not needed and speed is not important. Uniqueness is the strength of conventional method.

It is important to note that in this digital technology era, internet has been utilized in all aspect of life. Hence, using internet for customization process is a must. It will enable customers to easily involve in value creation from any devices, anytime and anywhere.

4. CASE STUDY

In this case study, a souvenir product of hat was used as object of study. A dummy internet based customization portal was constructed (figure 9). Local language was used as local people will be incorporated as respondents. The process of making hats was not changed (figure 10) and no additional investment has been made. The only additional thing was a system that accommodate customers to design by themselves the hats based on their preferences.

Closed and open questionnaires were used in order to know the response of customers to the new feature of customization. The real customized products were made in order to know the manufacturer's capability and to identify the engineering constraint. It is important to note that customers were enabled to customize the hat by many ways, including choosing the model and color, adding image and text, modifying the size and position of images, choose font and its size, etc.

Figure 9. A dummy internet based customization portal

Figure 10. Cutting and pressing machines, the main tools

From the customers' point of view the concept of customization is able to improve the value of the product due to the following aspects:

- It can give customers a feeling of accomplishment
- It provides a personal experience in value creation
- It enables customers to express their creativity
- It is able to improve product uniqueness
- It generates emotional value
- It creates a token of remembrance

These customers' perspectives are relevant to the previous research by Rooke and Ouadi (2009) who stated that the true luxury is when ones are able to express themselves as they like. Self-expression is a need for most of people with different ways of fulfillment. Norman (2004) reported that when people are asked about what the most valuable things they own, they will not always give the answer that refer to the most expensive thing they bought. Many of them refer to a simple thing but having emotional value which is then considered as "a token of remembrance". Personal experience in a process of making

products can boosts high value for customers as it can be a source of memory. For several types of products, uniqueness plays a significant role in customer buying decision (Risdiyono and Koomsap, 2009). Souvenir and gift were identified as common products demanded by customers to be unique. This is generally true, considering the fact that everyone, by nature is unique and psychologically has tendency to differ from others (Hippel, 2005).

There is no problem with manufacturer capability and manufacturing constraint to produce customized hats. No significant investments should be made in order to implement the concept. Hence, the improvement of product value can be gained economically, by using few resources. This is the main point of frugal innovation discussed in this paper.

5. CONCLUSION

New term of frugal innovation has been introduced in this paper. It refers to an innovation which generates high value improvement by using little cost and few resources. Internet-based customization in SMEs has been used as case study to give a clear picture of the concept. Based on the new values gained by customization model and investment cost committed, it is very clear that the new term has been implemented in a practical example as shown in the case study.

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