

VALUE PROPOSITION DESIGN AND BUSINESS MODEL GENERATION METHOD USE FOR BUSINESS INNOVATION FEASIBILITY ON THE MICROBIAL FERTILIZER – LAPTIAB BPPT

Wisnu Dewobroto, Bernard Marthin

Department of Industrial Engineering, Faculty of Industrial Technology, Trisakti University

Email wisnu.s@trisakti.ac.id : bernard.pobis11@gmail.com

ABSTRACT

Market opportunity for the organic fertilizer in organic farming is quite extensive. LAPTIAB-BPPT, as one of the government research institutions, has produce many innovations including organic fertilizer. The research focuses on the innovation feasibility study of organic fertilizer based on Value Proposition Design and Business Model Generation. According to the research, the Value Proposition of the organic fertilizer improves the produces up to 30% and is suitable for the food crop and plantation crop. Then, the business model was mapped into 9 blocks and Business Innovation Feasibility Study was conducted based on 3 aspects: Desirability, Feasibility, and Viability. As a result base on 3 aspects of Design thinking, the microbial fertilizer has valid business innovation, feasible product and viable business.

Key words : Value Proposition Design, Business Model Generation, Design Thinking, Business Innovation, Business Feasibility

1. INTRODUCTION

1.1. Research Background

The success of agriculture so far has been contributing to the fulfilment of food requirement. High production so far was supported by the technology which requires high inorganic materials, especially chemical materials for agriculture that may harm to human health if used continuously in high dosage, and is proven to be contributing to the damage of environment and natural resources, as well as the decreasing support form the environment.

LAPTIAB laboratory which is the integrated research infrastructure and facility to support the implementation of life-science-based technology directed to master and implement the strategic technology which is later can be disseminated to public using the mechanism of industrialization process. Under the supervision from BPPT (Agency for The Assessment and Application of Technology), LAPTIAB has produced the microbial fertilizer as the innovation in the agricultural area which consists of selected microbe and has been tested to improve and recover the soil fertility.

The microbial fertilizer as the research result by the research institution of LAPBTIAB-BPPT has not been fully commercialized although the market potential is relatively high if supported by the government by means of *Business Innovation Centre* (BIC) under the State Ministry of Research and Technology. This obstacle does not come merely from the research result which possibly difficult to apply, but also the difficulty of "upscaling" due to discrepancy of the research result to the consumers' needs, limitation of funding, capacity, and industrial willingness to execute them (Utomo, 2013).

1.2. Research Purpose

The purpose of this research are, first, to design *value proposition* for the microbial fertilizer. Second is to design *business model* for the microbial fertilizer. Finaly, third is to establish feasibility study for the business innovation of the microbial fertilizer.

2. THEORETICAL BACKGROUND

2.1. Business Innovation Feasibility

Business innovation feasibility can be identified using *Design Thinking* concept to find the solution for the existing problems.

Design Thinking can work to improve the efficiency of a production, improving the performance of business institution, health, and others. (Brown, 2010). The concept of Design Thinking is based on the 3 considerations in the planning and development of an innovation:

- Desirability, what the community wants and needs.
- Feasibility, the possible technical and organizational consideration in the context of community.
- Viability, the financial viability consideration.

2.2. Value Proposition Design

Value Proposition Design is a method designing value proposition of a product or service made or developed according to the consumers requirement (Osterwalder, 2014). Tool used in the Value Proposition Design is Value Proposition Canvas consisting of 2 (two) parts, the Customer Profile and the Value Map. First is, Customer (Segment) Profile that explains the specific market segment in the business model to attain the detailed and structured profile. In this tool there are 3 (three) parts, the customer gain, customer pain, and customer jobs. Second is Value Map that explains the facilities of value on a more detailed and structured business model. There are 3 (three) parts, the product and services, pain relievers, and gain creators.

2.3. Business Model Generation

Business Model Generation is a method used to improve a business model or to create the new one (Osterwalder, 2010). One of the tools used in this method is Business Model Canvas. Business Model Canvas is a logical picture business model on how the organization creates, delivers and captures a value. There are 9 aspects in Business Model Canvas namely Customer Segments, Value propositions, Channels, Customer relationships, Revenue Stram, Key resources, Key activities, Key partnerships and Cost structure

3. RESEARCH METHOD

3.1. Understand the Customer (Fertilizer Users)

Interview using Empathy Map is conducted to find out directly the problem of the fertilizer users regarding organic fertilizer. In this stage, the interview was conducted to 10 respondents. Moreover, 100 questionnaires distributed to 3 areas: DKI Jakarta, Bogor, and Karawang to find out the characteristics of the fertilizer user and the level of importance of each attribute of the organic fertilizer.

3.2. Value Proposition Design

This stage uses Value Proposition Canvas that generated from the overall result of the questionnaire and interview using Empathy Map to identify activities, problems, consumers requirement (fertilizer users). Next process is to identify the value of the product innovation of microbial fertilizer to meet all the demand and to overcome the problem experienced by the consumers.

3.3. Generate Business Model and Business Innovation Feasibility Study (Design Thinking)

In this stage, the business model is explained in 9 primary blocks: Customer Segments, Value Proposition, Channels, Customer Relationships, Key Activities, Key Resources, Key Partners, Cost Structures, and Revenue Streams. Then, the Business Model is validated by using 3 criteria in Design thinking (Desirability, Feasibility and Viability)

4. RESULT AND DISCUSSION

4.1. Understand the Customer

4.1.1. Emphatize

It can be seen from Empathy Map (Figure 1), the Say aspect stated that the fertilizer users experience difficulty or problem in the mechanism or technical difficulty in the organic fertilizer usage. Therefore, the clear information regarding the organic fertilizer usage and education to the fertilizer users is very important in order that the organic fertilizer can be effectively and efficiently used to gain maximum advantage from the plant quality.

From the Do aspect, it can be said that the frequency of fertilizer usage by the users is between once in 2 to 3 months depending on

the plants and the cultivation period. Additionally, the information regarding the fertilizer can be obtained from the interaction with other farmers and also online forum in the Internet, so that the utilization of online media as the information sharing site for organic fertilizer usage is very important, as well as the provision of information for the users to help them to cope with any problems they experience.

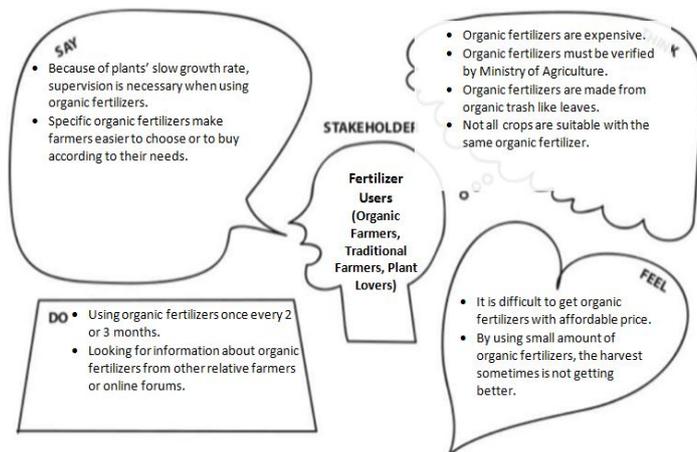


Figure 1. Empathy Map

On the Think aspect, the fertilizer user thinks that the price of organic fertilizer is relatively expensive, the suitability to all kinds of plants, and the quality of the organic fertilizer must be tested by the Ministry of Agriculture. The price of organic fertilizer is relatively not affordable because the producers of organic fertilizer have not entered large scale industrial operation and the investment risk of the organic fertilizer is relatively high (Yunus, 2012). To overcome the problem, the development of organic fertilizer shall be done by the developer in order to improve the quality. Additionally, the developer and the business manager can also conduct price analysis by comparing the price of similar organic fertilizers in determining the price of the organic fertilizer so that the price gap will not too far compared to the market price and is sought to be lower than the similar product price.

Based on the Feel aspect, the fertilizer users felt difficulty in obtaining the organic fertilizer with affordable price. Therefore, a trust image shall be built on the organic fertilizer using offline and online marketing, and the carefulness of the business manager shall

brought into attention in selecting and establishing cooperation with the distributor to market the organic fertilizer.

4.1.2. Characteristics of the Fertilizer User

From the result of the research questionnaire on the characteristics and behaviour of the fertilizer users, it can be concluded that:

- a. The gender of the fertilizer users is 84% male and 16% female.
- b. The occupation of the fertilizer users is 56% farmers, 13% employees, 8% entrepreneur, and 23% others.
- c. The age of the fertilizer users is 23% within the range of 20-29 years old, 69% within the range of 30-39 years old, and 8% within the range of 40-49 years old.
- d. The price per packaging bought by the fertilizer users is 30% within the range of IDR 10,000.00 – IDR 50,000.00 and 70% within the range of IDR 50,001.00 – IDR 100,000.00.
- e. The frequency of fertilizer purchasing by the fertilizer users is 47% buys every month and 53% others.
- f. 45% of the fertilizer users rarely use the fertilizer, 47% of the fertilizer users choose several times, and 8% of the fertilizer users select others.
- g. The place for purchasing the fertilizer selected by the fertilizer users is 38% through farmers' cooperative, 23% through agent/distributor, 32% through plants seller, and 7% through plant exhibition.
- h. Information media regarding the fertilizer which can be accessed by the fertilizer users shows that 39% through the socialization/extension to the farmers, 8% through newspaper, 45% through the internet, and 8% through other media.
- i. 62% is the organic fertilizer users and 38% is inorganic fertilizer users.

4.1.3. Organic Fertilizer Attribute

It can be seen from table 1 attributes that are important about Organic fertilizer (categorized as 8 product quality dimensions)

Table 1. Organic Fertilizer Attributes

| No | Attribute | Dimension |
|----|--|-------------------|
| 1 | Organic fertilizer produces more quantity of harvest. | Performance |
| 2 | Organic fertilizer produces healthier crops for consumption. | |
| 3 | Organic fertilizer can be used for variety of crops. | Features |
| 4 | Organic fertilizer maintains the soil nutrients therefore it does not require more intensive cultivation. | |
| 5 | Organic fertilizer is affordable | Conformance |
| 6 | Organic fertilizer sold in the market has the easy to carry container/weight. | |
| 7 | Organic fertilizer is easy to get. | |
| 8 | Organic fertilizer has a strong packaging. | Reliability |
| 9 | The seal of organic fertilizer is easy to open and close. | |
| 10 | The packaging of organic fertilizer contains the name, address and the telephone number of the manufacturer and distributor. | Serviceability |
| 11 | The packaging of organic fertilizer contains the user manual and dosage. | |
| 12 | Organic fertilizer has a distinct expiry date. | Durability |
| 13 | The packaging of organic fertilizer does not damage easily when stacked in large quantities. | |
| 14 | The packaging of organic fertilizer has a bright interesting color. | Aesthetics |
| 15 | The packaging of organic fertilizer contains picture and colorful writings. | |
| 16 | Organic fertilizer receives many testimonials from other users. | Perceived Quality |
| 17 | The organic fertilizer has been registered and obtained license from the Ministry of Agriculture. | |

comprehensive, the packaging is strong, the fertilizer is tested, durable, and available at the farmers' cooperative, and of course the price is affordable.

During the process of value proposition of the microbial fertilizer at the Value Map section, the interview was conducted with the producer of microbial fertilizer, i.e, LAPTIAB-BPPT. Microbial fertilizer product developed so far has met most of the Consumer Pain and Gain. For the remaining Pain and Gain, the producer and developer of microbial fertilizer LAPTIAB-BPPT has tried to meet them completely including the price aspect and the capability of the microbial fertilizer.

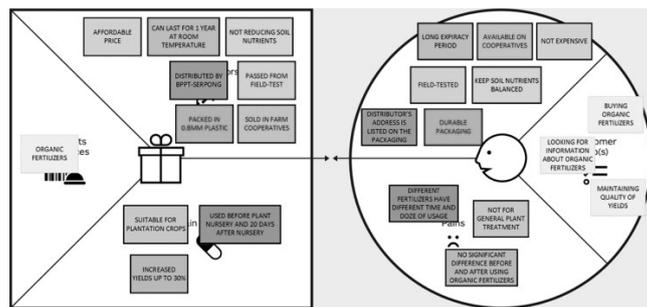


Figure 2. Value Proposition Design

4.2. Value Proposition Design

In the process of Value Proposition Design, identification of Customer Profile was conducted on the organic fertilizer using the questionnaire and interview using Empathy Map. On the Customer Jobs, the main activity conducted by the organic fertilizer users is to maintain the plant quality, seek the information regarding the organic fertilizer and purchase the organic fertilizer. The maintaining of plant quality is the activity of the organic fertilizer user, in which includes the use and supervision of organic fertilizer as stated in the result of interview using Empathy Map and the result of screening using introductory questionnaire. The Pain aspect experienced by the organic fertilizer user is that every fertilizer has different usage instruction, not suitable to all varieties of plants, and the produce is rather similar than those without organic fertilizer. From the Gain aspect, the organic fertilizer users expect the information from the producer or distributor to be clear and

Therefore, the *Value Statement* formulation of the microbial fertilizer product is: "For the conventional or organic farmers and the plant lovers who require organic fertilizer to improve the plant quality, the microbial fertilizer Healthy Grow is the suitable fertilizer for food and plantation crop, and can improve the crop produce up to 30%, Unlike other organic fertilizer, our product contains active microbe and protect the plants from fungus.

4.3. Business Model Generation

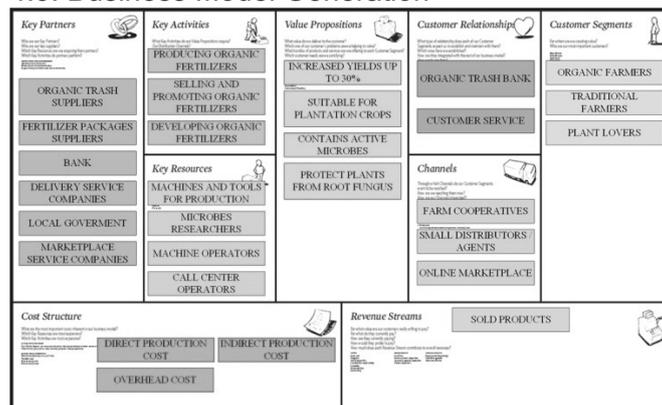


Figure 3. Business Model

Based on the Business Model Generation (Figure 3), feasibility study is applied considering 3 areas which are Desirability, Feasibility and Viability. From desirability aspect, target customer of the microbial fertilizer are the organic farmers, conventional farmers, and plant lovers. Additionally, the main value offered by the microbial fertilizer can meet the consumer's requirements especially those that give direct impact to the consumers, which is the suitability of fertilizer to the food and plantation crops, and the improvement of crop produce up to 30%. The microbial fertilizer is also marketed in 3 (three) ways: through farmer cooperative, through distributor, and through marketplace. Farmer cooperative is the main access because in Bogor and Karawang area, there are still many active farmer cooperatives. Distributor is the marketing access for the area with limited number of farmer cooperatives such as Jakarta, and the type of distributor in this case is the plant sellers. Market place access is selected because marketing using online media can expand the marketing area and reach the farther candidate consumers (Supriadi, 2012). By establishing the business in Bogor area, the Customer Relationships to be sought is to establish the organic waste bank which can help the company in obtaining the organic raw material and giving the additional income to the candidate customers who sell the organic waste to the company. Additionally, the establishment of telephone-based information service by means of cooperation with LAPTIAB-BPPT can help the candidate consumers who want to know and inquire about the microbial fertilizer.

From feasibility aspect, the manufacture company is the primary activity based on the process established by the LAPTIAB-BPPT. Additionally, the company markets the product using online and printed media to distribute information to potential consumers. Both types of media, are the largest source of information and communication which can help the company to improve brand awareness (Irawan, 2011). Furthermore, the raw material and production facilities used by the company based on the composition and production process as set forth by the developer of microbial fertilizer, the LAPTIAB-BPPT, and these two matters will not change until the

developer of the microbial fertilizer provide further information to the company because the change of the product composition will affect the production process, which in turn will change the production cost and selling price (Sukiman, 2011). The company also establishes cooperation with other parties which can help in running the business effectively such as organic waste supplier which helps in providing the organic raw material; supplier of organic fertilizer packaging which provides the 0.8 millimetre plastic and net capacity of 3 (three) kilograms and has been labelled for the microbial fertilizer packaging; bank to help the company in terms of funding for capital loan; Regional Government which provides information and regulation regarding the product and business; goods transport provider to help the company in distributing the product to the distributor or consumers; and Marketplace provider (Tanipedia, Tokopedia, and others) which helps the company in marketing the product using online media.

The last category is Viability that stated the initial working capital is IDR. 490,300,000.00. Net Present Value of IDR. 6,904,701.00, Internal Rate of Return of 25.61% and Profitability Index of 2.13 which means it is feasible. Therefore, it can be found that the Payback Period of the microbial fertilizer business is 3 Years and 2 Months and the Break Even Point is 2,304 units.

As a result, based on 3 aspects of Design thinking, the microbial fertilizer has valid business innovation, feasible product and viable business.

5. CONCLUSION

Value Proposition of the microbial fertilizer product is the fertilizer that is suitable for the food and plantation crops, and can improve the crop produce up to 30%. Additionally, the microbial fertilizer contains active microbe which can protect the plants from the root fungus.

Moreover, Business Model Generation for microbial fertilizer product is as follows: On the Customer Segments, the main consumers of the microbial fertilizer are the organic farmers, conventional farmers, and plant lovers. On

Value Propositions, the microbial fertilizer is the suitable fertilizer for the food and plantation crops, and can improve the crop produce up to 30%, which contains active microbe and can protect the plants from the root fungus. On the Channels, marketing of the microbial fertilizer is done through the farmers' cooperative, distributor/plant seller, and marketplace. Customer Relationships, the company can create an organic waste bank and information/call centre service to improve the customers' relationship. For Key Activities block, the main activity of the company is the production of the microbial fertilizer, development of the microbial fertilizer, and marketing of the microbial fertilizer. Whereas on the Key Resources block, the company requires the raw material, production facilities, and human resources. The cooperation on the Key Partners block is conducted by the company with the supplier of the organic waste, supplier of the fertilizer packaging, bank, regional government, goods transport provider, and marketplace provider. From the Cost Structure aspect, the company incurs the cost in form of investment, direct raw material, direct labour, and overhead cost. In the last block, the Revenue Stream, the company income is resulted from the selling of microbial fertilizer.

After analysing the business innovation feasibility which is grouped into 3 (three) category of Desirability, Feasibility, and Viability, the result from Desirability, the Customer Segments of the microbial fertilizer are organic farmers, conventional farmers, and plant lovers; Customer Relationship with organic waste bank and information service; Channel with farmers' cooperative, distributor, and marketplace; and for the Value Proposition, it is the suitability of the fertilizer to the food and plantation crops, active microbe content, and protection to root fungus. For the Feasibility category, the result of the Key Activities of the microbial fertilizer is production, marketing, and fertilizer development; the Key Resource is raw material, human resource, and production facilities; then for the Key Partners are the supplier of organic waste, fertilizer packaging, bank, regional government, goods transport provider and marketplace. The last category is Viability, of which known that for the initial

working capital is IDR. 490,300,000.00. Net Present Value of IDR. 6,904,701.00, Internal Rate of Return of 25.61% and Profitability Index of 2.13 which means it is feasible. Therefore, it can be found that the Payback Period of the microbial fertilizer business is 3 Years and 2 Months and the Break Even Point is 2,304 units. Thus, based on 3 aspects of Design thinking, the microbial fertilizer product is feasible and has valid Business Model.

6. REFERENCES

- (a) Arikunto, Suharsimi (2006). *Prosedur Penelitian Suatu Pendekatan Praktik*. Jakarta: Rineka Cipta.
- (b) Blank, Steve & Bob Dorf (2012). *The Startup Owner's Manual*. California: K&S Ranch, Inc.
- (c) Brown, Tim & Jocelyn Wyatt (2010). *Design Thinking for Social Innovation*. California: Stanford Social Innovation Review.
- (d) Campbell, Ken (2007). *A Feasibility Study Guide for an Agricultural Biomass Pellet Company*. Minnesota: Cooperative Development Services.
- (e) Dewobroto, Wisnu & Siagian, Julisa. 2015. *Business Model Generation and Lean Startup Method As The Basis For Business Development Feasibility Study, Case Study of PO. Gajah Mungkur Sejahtera*. Jakarta: Universitas Trisakti.
- (f) Fariadi, Herri (2013). *Pertanian Organik Sebagai Solusi Alternatif Dalam Pembangunan Pertanian Yang Berwawasan Lingkungan* (Online). Bogor: Institut Pertanian Bogor.
- (g) Ferdinand, Louise (2015). *Pentingnya Testimonial & Review Pada Sebuah Bisnis*. Jakarta: (Accessed 21 Desember 2015)
- (h) Garsoni, Sonson (2010). *Teknik Menentukan Dosis Pupuk Anorganik*. Jakarta (Accessed 22 Desember 2015)
- (i) Hanson, Jonas (2003). *Total Quality Management – Aspects of Implementation and Performance: Investigations with a Focus on Small Organisations, a Doctoral Thesis*. Swedia: Lulea University of Technology.
- (j) Irawan, Handi D (2011). *Banyak Cara Mendongkrak Awareness*. Jakarta:

- Marketing.co.id. (Accessed 20 Desember 2015)
- (k) Kasmir & Jakfar (2003). *Studi Kelayakan Bisnis*. Jakarta: Kencana.
- (l) Kotler, Philip & Lane, Kevin (2009). *Manajemen Pemasaran*. Jakarta: Erlangga
- (m) Norman, Don (2013). *The Design of Everyday Things*. New York: Basic Books.
- (n) Osterwalder, Alexander & Pigneur, Yves. (2010). *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers*. New Jersey: John Wiley & Sons, Inc.
- (o) Osterwalder, Alexander, Pigneur, Yves, et al. (2014). *Value Proposition Design*. New Jersey: John Wiley & Sons, Inc.
- (p) Sang Un Chae, Johannes & Hedman, Jonas (2015). *Journal of Business Models Vol. 3: Business Models For NFC Based Mobile Payments*. Denmark: Aalborg University.
- (q) Sukiman, Denmas (2011). *Pengaruh Perhitungan Harga Pokok Produksi Terhadap Penetapan Harga Jual Produk*. Tangerang: Universitas Pamulang.
- (r) Sunyoto, D (2014). *Studi Kelayakan Bisnis*. Yogyakarta: CAPS.
- (s) Supriadi, Cecep (2012). *Keuntungan Pemasaran Online Yang Menggiurkan*. Jakarta (Accessed 23 Desember 2015)
- (t) Sutrisno, Hadi (1982). *Metodelogi Research*. Yogyakarta: Percetakan Universitas Gajah Mada.
- (u) Utomo, Yunanto W (2013). *"Upscaling" Jadi Kendala Komersialisasi Hasil Riset*. Jakarta: Kompas. (Accessed 20 Maret 2015)
- (v) Veryzer Jr., Robert W (1995). *The Place Product Design and Aesthetics in Consumer Research*. New York: Rensselaer Polytechnic Institute.
- (w) Yunus, Muhammad (2012). *Kenapa Harga Produk Organik kok Mahal?* Jakarta: Kompasiana. (Accessed 20 November 2015)

AUTHOR BIOGRAPHIES

Wisnu Sakti Dewobroto, lecturer in Faculty of Industrial Engineering, Trisakti University. His Educational Background was in Industrial Engineering Trisakti University, then, Master of Science in Business Technology, Strathclyde University, Glasgow – UK and Doctoral degree major in Service Management, Trisakti University. Wisnu's research mainly focusing on Entrepreneurship and Business Innovation. Wisnu is a member of Organizational and Business Planing Laboratory as the head of Entrepreneurship Department. Currently, He is also the director of Trisakti University Business Incubator. Email : Wisnu.S@trisakti.ac.id website : wisnudewobroto.com

Bernard Marthin Haratua , Graduated from Industrial Engineering, Faculty of Industrial Engineering, Trisakti University. Bernard has research interest in Entrepreneurship , spesifically in Business Innovation. He is now the member of Trisakti Business Network Community. Email : julisa_siagian@hotmail.com