Business model analysis of mushroom agroindustry and its sustainable development strategy in Covid-19 pandemic

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Abstract. The agricultural sector is one that has been impacted by Covid-19. However, because of its function in the food production sector, it has to keep contributing to the economy of Indonesia even in the pandemic situation. Mushroom is one of the agricultural commodities which can be considered quite promising. Many mushroom producers turn into potential Micro Small and Medium Enterprises (MSMEs). Behind the good aspects, some evidence argued that the production performance of the mushroom business is not optimal related to less capacity and lack of appropriate knowledge. This research aimed to map Business Model Canvas (BMC), identify the existing conditions of the business model, and understand the strengths, weaknesses, opportunities and threats of the mushroom agro-industry as well as formulate a business development strategy. This research is a descriptive quantitative study conducted in April-November 2020. Respondents are the business owner of the mushroom industry chosen purposively for this research. Data analysis was by mapping BMC and SWOT analysis. Research shows that nine elements of the canvas business model had simplified the business. Value creation done by mostly online marketing, diversify products and opening cooking classes to keep the business sustain. Proactive strategy requires mushroom agro-industry to actively seize various opportunities in the fast development of in business environment by optimizing digital marketing, marketing strategy and open partnership.

1. Introduction
The Covid-19 pandemic that occurred globally has various impacts, especially in the economic sector. The economic impact is not only domestic but also globally. The global economy projects of the International Monetary Fund (IMF) is estimated to grow at minus 3%. In Indonesia, it is also has a significant impact on the tourism, trade and industry sector, including Micro, Small and Medium Enterprises (MSMEs). The effect of covid-19 has been seen directly due to massive layoffs in several companies. Some businesses were closed as an impact of the dismissal of employees [9].

The agricultural sector is one that has been impacted. However, because of its function in the food production sector, it has to keep contributing to the economy of Indonesia even in the pandemic situation. One of the agricultural commodities which can be considered quite promising in Indonesia is mushroom. Many mushroom producers turn into potential MSMEs. Belonging to the vegetable category, the mushroom is valued for its high-quality protein, excellent unsaturated fatty acids, high
content of some vitamins, highly tradable commodity and the advantage of short harvesting periods as well as easy-to-use technologies [7]. The production of mushrooms and the mushroom-based industry is promising. According to the central statistics agency (BPS), the production of oyster mushrooms in Indonesia in 2016 reached 40,914,331 kg. Although, in 2017 its production experienced a decrease to 3,701,956 kg, in 2018 mushroom production increased by 31,051,571 kg as a response to the rising demand for mushrooms. The increase was because mushrooms are an ingredient in alternative foods [17].

One of the cities in Indonesia that has a high agro-industrial unit and small-medium enterprise is Malang [4]. More than 50% of the total agro-industries in Malang city are food and beverage processing industries. The industry generally uses horticultural commodities as the raw material, namely oyster mushrooms. Oysters mushroom processed into various kinds of processed products such as mushroom nuggets, mushroom sausages, chips mushrooms and shredded mushrooms. Some evidence argued that the production performance of the mushroom business is not optimal related to less capacity and lack of appropriate knowledge [7]. The growing demand for white oyster mushrooms has caused industries to develop their products to be able to meet the request. Business development is one of the solutions to increase the amount of production [17]. The aim of this research is to map the existing business model. SWOT analysis was done to understand internal and external factors as well as creating the best strategy for mushroom business sustainability during the covid-19 pandemic.

2. Research method

2.1 Respondent and sampling
Respondents were 20 business owners that have more than 10 years’ experience in the mushroom agroindustry. Purposive sampling was carried out to select the respondents.

2.2 Data collection
The research data used were the primary data collected from April to November 2020. Primary data obtained from in-depth interviews to collect information on existing problems such as nine elements of Business Model Canvas. After that, it was also used to observe and determine internal and external factors for SWOT analysis.

2.3 Data analysis
Business Model Canvas (BMC) can create alternative strategies in the form of new, more competitive business. The business model will help understand, explain and predict what activities should be to make a profit for the company or organization [2]. The first stage of this study is analyzing the business model that has been run by the mushroom agroindustry and then maps it on the BMC. SWOT analysis or categorizing issues into strengths, weaknesses, opportunities, and threats is one of the most respected and prevalent tools for strategic planning [6,13].

The combination of analysis on strengths, weaknesses, opportunities and threats (SWOT) through BMC is an effective way to see each component of the business model in more detail [4,5]. There are four combinations of strategy in SWOT analysis; Strength-Opportunity (S-O) which pursues opportunities that fit company's strengths; Weakness-Opportunity (W-O) which overcomes weaknesses to pursue opportunities; Strength-Threat (S-T) which identifies ways that the firm can use its strengths to reduce its vulnerability to external threats; and Weakness-Threat (W-T) which overcomes weaknesses to reduce its external threat [3].

3. Results and Discussion
3.1 BMC of mushroom agroindustry
The variables used in the study consisted of nine elements of the BMC as a visual depiction of the business model currently being run by mushroom agroindustry players in Malang, East Java. The nine elements of BMC cover four main areas of business, namely customers, supply, infrastructure, and
financial sustainability [16]. BMC of mushroom agroindustry is shown in Figure 1. The value proposition offered in the form of fresh oyster mushrooms and processed oyster mushroom that has a better price than those in traditional markets. During this pandemic, the mushroom agroindustry also makes some adjustments to the product. For example, it sells juices, smoothies and snacks also catering based on the processed mushroom.

| Key Partnership | Key Activities | Value Proposition | Customer Relationship | Customer Segment |
|-----------------|----------------|-------------------|-----------------------|------------------|
| 1. Supplier of raw and additional material | 1. Procurement of raw materials | Products (Trade Mark, Quality Assurance): 1. Fresh Oyster Mushrooms 2. Processed Oyster Mushroom Products 3. Other: catering, smoothies, snack | Personal Aids 1. Website, call center 2. Direct messages, social media 3. Direct conversation | 1. Housewives 2. Healthy lifestyle enthusiasts 3. Middle-end traders |
| 2. Design supplier | 2. Production process (Fresh Oyster Mushrooms or processed mushroom products) | Service 1. Oyster mushroom supplier 2. Healthy and cooking class | | |
| 3. Reseller, retailer, and souvenir shops | 3. Marketing | | | |
| | 4. Services | | | |

| Key Resources | Channels | Customer Relationship | Customer Segment |
|---------------|----------|-----------------------|------------------|
| 1. Machinery and production equipment | Direct: 1. Via media social 2. Delivery order 3. Worth of mouth | | |
| 2. Product quality assurance including product certificate and production process | Indirect: 1. Reseller 2. Retail, souvenir shops | | |
| 3. Human resources | | | |
| 4. Financial resources | | | |

| Cost Structure | Revenue Streams |
|----------------|-----------------|
| 1. Variable cost: production, marketing, labour cost | 1. Sales to customer |
| 2. Fixed cost: cooking utensils, Wi-Fi, electricity, water cost | 2. Sales to end consumer |
| | 3. Service sales |

**Figure 1.** Business model canvas of mushroom agroindustry.

Mushroom agroindustry's target market is middle-end traders, housewives and healthy lifestyle enthusiasts. It is understood that pandemic makes consumers focus on their primary needs, thus the mushroom processed product will be secondary meals. This is why the mushroom agroindustry tends to produce healthy food to reach the possibility of healthy food enthusiasts as their new target market.
Furthermore, housewives are also their main target because they think they are the decision-maker in the family.

Relationships with customer used to convey the value proposition offered by to consumers, and mushroom business owner has owned their website and they are also active in social media. Social media and website help to boost marketing and another benefit is, they can easily get feedback on their product. Key activities performed in the form of procurement of raw materials, standardized production process (Fresh Oyster Mushrooms or processed mushroom products), maintaining long term marketing and maintaining service excellence. This requires key partners with supplier and reseller such as seen in Figure 1. Activities cost structure and revenue stream plays important role especially in the pandemic. Cost structure is variable cost such as production, marketing, labour cost, and Fixed cost is cooking utensils, Wi-Fi, electricity, water. Income was coming from sales, and also cooking class. Even the business owners are business trainer.

3.2 Identify the strengths, weaknesses, opportunities and threats of the mushroom agro-industry

3.2.1 Internal factors

Internal factors will be identified based on the findings of the field that covering the potential factors. All of these factors will be identified strengths and weaknesses factors as mentioned in Table 1.

| Internal Strategy Factors                          | Weight (W) | Rating (R) | Score (W x R) |
|---------------------------------------------------|------------|------------|---------------|
| Strength                                          |            |            |               |
| 1. Customer segmentation is clear                 | 0.25       | 4          | 1             |
| 2. Product quality assurance                      | 0.25       | 4          | 1             |
| 3. Marketing channel                              | 0.125      | 3          | 0.375         |
| 4. Partnership relationship                       | 0.125      | 3          | 0.375         |
|                                                    | 0.75       |            | 2.75          |
| Weakness                                          |            |            |               |
| 1. Indirect marketing channel constraints          | 0.125      | 2          | 0.25          |
| 2. Lack of customer enthusiasm for healthy food products | 0.125  | 2          | 0.25          |
|                                                    | 0.25       |            | 0.5           |
| Total                                             | 1          |            | 3.25          |

3.2.2 External factors

External factors will be identified based on the findings of the field that covering the potential factors. All of these factors will be identified strengths and weaknesses factors as mentioned in Table 2.

| External Strategy Factors                          | Weight (W) | Rating (R) | Score (W x R) |
|---------------------------------------------------|------------|------------|---------------|
| Opportunity                                       |            |            |               |
| 1. Online marketing optimization                   | 0.375      | 4          | 1.5           |
| 2. There are relatively few competitors for processed mushroom products | 0.25      | 3          | 0.75          |
| 3. Optimization of the partnership relationship    | 0.125      | 3          | 0.375         |
|                                                    | 0.75       |            | 2.675         |
### 3.3 Formulating business development strategy

**Table 3. SWOT strategy of mushroom agroindustry.**

| External Strategy Factors | Weight | Rating | Score (W x R) |
|---------------------------|--------|--------|---------------|
| 1. Sales partner commitment and loyalty | 0.125  | 3      | 0.375         |
| 2. Other food product competitors | 0.125  | 2      | 0.25          |
| Total                     | 0.25   | 0.625  |               |

| Internal                      | Strengths (S) | Weaknesses (W) |
|-------------------------------|---------------|----------------|
| 1. Clear customer segmentation | 1. Obstacles to indirect marketing channels |
| 2. Product quality assurance  | 2. Lack of customer enthusiasm for healthy food products |
| 3. Marketing channels         |                |                |
| 4. Partnership relationship  |                |                |

**Opportunity (O)**

1. Optimizing online marketing
2. There are relatively few competitors for processed mushroom products
3. Optimization of partnership relationships

**S-O Strategy**

1. Optimizing the using of digital marketing (O1, S1, S2)
2. Optimizing marketing strategy, penetration (S2, O2)
3. Open partnership with win-win solution (S3, S4, O3)

**W-O Strategy**

1. Optimizing direct marketing and online marketing (O1, W1)
2. Optimizing branding as a healthy diet supporting food (O2, W2)
3. Opening possibility with all reseller to boast sales (O3, W3)

**Threats (T)**

1. Commitment and loyalty of sales partners
2. Other food product competitors

**S-T Strategy**

1. Increasing value creation to gain more customer (S1, T2, S2)
2. Having a clear agreement (MoU) benefitted to both party (T1, S4)
3. Improving communication in marketing channel (S3, T1)

**W-T Strategy**

1. Increasing loyalty by giving interesting promotion (T1, W2)
2. Optimizing branding as healthy diet supplementary food (T2, W1, W2)

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**Figure 2.** SWOT quadrants of mushroom agroindustry.

SWOT strategy as a development strategy of mushroom agroindustry shown in Table 3. Internal factors and external factors both shows 3.25 and this score was in Quadrant I. Figure 2 shows SWOT
strategy applied to the mushroom industry is Strength-Opportunity (S-O) strategy. It promoted an offensive or proactive approach to developing business sustainability [12]. It also requires mushroom agroindustry to actively seize various opportunities favourable for the fast development of business environment while seeking breakthroughs in that process [14]. Strategy approaches can be seen in Table 3, which can be conducted as follows:

1. Optimizing the using of digital marketing (O1, S1, S2). Digital marketing of mushroom agroindustry done by optimizing digital channels. It is more effective to acquire customers and build customer preferences, promote brands, retain customers and increase sales [11]. Mushroom agroindustry can use many marketing platforms that are benefitted in social distancing condition.

2. Optimizing marketing strategy, penetration (S2, O2). Marketing strategy done is pricing penetration, where a firm continues its initial low price from introduction to rapidly capture sales and market share, but with lower profit margins than skimming. Although revenues are lower, penetration provides a barrier to entry because competitors are less attracted to a market with reduced profitability [15]. This also has to do with product diversification [8].

3. Boosting a win-win solution partnership (S3, S4, O3). Mushroom agroindustry must be able to maintain a good relationship with the retailer and raw material producers (farmers). Both the partners experience significant short-term and long-term financial gains [10].

4. Conclusions

BMC has nine important elements to help in identifying the current business model operated by mushroom agroindustry, and the elements to be further enhanced for achieving the sustainability of future businesses. Results obtained that BMC of mushroom agroindustry has covers all areas of business, such as customers, supply, infrastructure, and financial sustainability. SWOT analysis has given the best strategy to cope with COVID-19 pandemic. Mushroom agroindustry has various strategic factors to support the development based on the strength and opportunity owned by the business. Mushroom agroindustry position was in Quadrant I, indicating that the company is advised to do proactive strategies such as optimizing digital marketing, using the penetration strategy, and opening a win-win solution partnership.

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