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Research Article

Sweet Bread Teaching Factory's Feasibility Projection at Banyuwangi State Polytechnic

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Abstract.

This study aims to provide an overview of sweet bread production as an alternative in planning and developing teaching factories based on business feasibility projection analysis. A quantitative technique was applied in this research. Survey techniques and statistical tests were used to examine the hypotheses. To demonstrate that an institution can and should continue its sweet bread business, several variables were measured, including the Internal Rate of Return (IRR), Net Present Value (NPV), Return on Investment (ROI), Benefit–Cost Ratio (B/C ratio), Payback Period (PBP), and Break Event Point (BEP), providing further information for Business Model Canvas analysis of a business model. Based on the BMC, the value propositions are a variety of sweet bread, ease of access, affordable prices, quality, and taste. Key activities include sweetbread production, stock management, marketing and promotion, and customer service. Customer segmentation involves students, lecturers, staff, and institutional visitors. An analysis of financial projections reveals that business is feasible. This can be seen from IRR = 53,19%; the NPV > 0 is equal to IDR 85,222,327; ROI = 216.69%; B/C ratio =1.07; BCR > 1; PBP = 41 months; and BEP = IDR 5,528,669.25.

Keywords: teaching factory, sweet bread production, business feasibility, financial projection

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1. Introduction

A teaching factory is a production-based learning concept (production-based learning/PBL) that prioritizes the practical abilities of students through exposure to real-world cases/products/needs. The teaching factory prioritizes collaborative aspects by actively involving students involved in the product/service work in a team. The concept of teaching factory has also been implemented in several polytechnics [1]. According to Mavrikios et al. [2], the Teaching Factory concept follows a two-way knowledge transfer channel, where manufacturing topics become the basis for a new synergy model between academia and industry.

The Banyuwangi State Polytechnic (POLIWANGI) is a system of professional higher education that emphasizes the mastery and development of science and technology to

support the industrialization era. Efforts to present the industry on campus are supported by product-based curricula. Teaching factories integrate the learning process to produce products and services that are worth selling to generate added value for educational institutions, because the teaching factory process can instill an entrepreneurial spirit in students. Through the teaching factory process, students can create products and services that have added value and quality that can be absorbed and accepted by society. Bread is one of the most recognized and popular baking products.

Bread is a food made from the main ingredients of wheat flour, yeast, salt, and water, as well as other additives such as sugar, margarine, eggs, and milk. Sweet bread is a type of bread that has a pronounced sweet taste and a soft texture with or without filling. The type and shape of bread depends on the formulation of the dough and how it is made. Bread can be divided into three types based on the dough formulation: sweet bread, white bread, and soft rolls. Sweetbread dough is a dough made from a formulation that uses a lot of sugar, fat and eggs [3].

A feasibility projection analysis is useful for assessing whether a business is feasible to continue. The purpose of this study is to provide an overview of institutions that can use sweetbread production as an alternative in planning and developing teaching factories based on business feasibility projection analysis.

2. Methods

In this case, the problem that became the object of research was the desire of the Banyuwangi State Polytechnic, who developed its teaching factory by opening a new expansion called Sweet Bread.

Therefore, a business feasibility analysis must be conducted so that the opening of a new teaching factory can produce an outcome in accordance with the wishes of the institution. This stage begins with identifying and formulating the problem and determining the objectives and limitations of the problem. This was done so that the research could be conducted in accordance with the required scope. These activities can be conducted by conducting literature studies and preliminary field studies.

The business model analysis level was the level of the teaching factory that will run it. This study discussed the overall factors associated with how to run this business from the institution's perspective [4]. Business model data collection techniques based on interviews and observations to obtain factual data [5]. Data collection was carried

out using two methods. First, primary data collection was carried out through research surveys, direct observation, in-depth interviews, and Focus Group Discussions (FGD). In-depth interviews were conducted with the head of the study program, head of the bread production section and students. Second, secondary data collection was carried out through institutional surveys to obtain data and study related documents. In this research, the sampling technique used was purposive sampling, which is more accurately called selection based on criteria. The data examination technique in this research uses source triangulation and method triangulation. This is done by comparing the results of observations, interviews and document analysis. It is hoped that the final results of the analysis will reach a high level of quality and validity.

Financial feasibility analysis uses a quantitative descriptive method with the approach of income projection, profit and loss projection, cash flow projection, balance sheet projection and feasibility study result of opening teaching factory [6]. Projected income represents how much revenue will be received by the institution if all products sold in the market are run out by consumers. Cash flow projection is a report that prepares to know the changes in cash conditions that occur within a certain period.

3. Result and Discussion

3.1. Business Model Canvas (BMC)

BMC can be used systematically to understand, design, and implement existing business models or create new business models [7]. The canvas in BMC divides the business model into nine main components. The business model of the sweet bread teaching factory using BMC is shown in Figure 1.

3.1.1. Customer segments

Customer segments help teaching factories to know which customers they will serve, so that the sweetbreads teaching factory can focus on serving only its potential customers rather than other customers who will not necessarily buy its products. Potential customers for this business are students, faculty and staff as well as visitors to the institution who pass by the sweetbreads points of sale.

Figure 1: Business model of sweetbread teaching factory in Banyuwangi State Polytechnic using business model canvas.

3.1.2. Customer relationships

This block shows how the teaching factory relates to its customers. Teaching factories need to maintain good relationships with customers so that customers are expected to be more loyal. Teaching factories make various efforts to maintain good relationships, including friendly services to help create a positive experience; loyalty programs such as point cards or discounts for frequent customers; and feedback and assessment programs to provide input and reviews to continuously improve products and services.

3.1.3. Channels

The channel block relates to how the teaching factory deals with customers determined to distribute value. The teaching factory distribution channel is carried out in two directions: in addition to selling wholesale to resellers, namely cooperatives, it sells itself in the agribusiness study program.

3.1.4. Revenue stream

The revenue stream is defined as the revenue from each market segment that can be measured in terms of the money received from customers. Revenue stream is not the profit earned, because it has not been deducted from the costs incurred for production and other expenses [8]. The teaching factory revenue stream comes from the sale of sweet bread as the main source of income with various types of sweet bread, complementary drinks such as coffee, tea, or soft drinks, as well as the sale of supporting products such as special packaging and frozen bread to take home or related merchandise.

3.1.5. Value propositions

The first value provided by the teaching factory is the variety of sweet bread variants, which offer various types and flavours of sweet bread to meet the tastes of various customers. The second value is quality and deliciousness, caused by the actors using quality raw materials and manufacturing processes to provide delicious, healthy, and satisfying flavours. The third value is placing sweet bread outlets in strategic locations in the campus area to provide easy access to customers. The last value that the teaching factory has is that it can offer competitive prices to attract customers from various layers.

3.1.6. Key resource

This building block shows the key resources needed in the teaching factory business model to produce value according to the specifications offered to customers, namely, raw materials, so that the teaching factory ensures the supply of quality raw materials for making sweet bread, labor, namely beakers, sales employees, customer service staff to operate outlets, and strategic locations to attract the attention of potential customers.

3.1.7. Key activities

The key activities carried out by the teaching factory are production activities, starting from raw material supplies, consistent recipes and production, packaging, and stock management, related to monitoring raw material and finished product stocks to maintain product availability; marketing and promotion, namely developing marketing strategies

to increase business visibility and attractiveness; and customer service by providing good and efficient customer service.

3.1.8. Key partnerships

Key partners are the main business partners. One of them is the suppliers who supply raw materials so that teaching factory business activities can run. Establishing a good relationship with suppliers is one way to ensure obtaining the right raw materials, both in quantity and quality, as well as ensuring the continuity of materials. Another partner who is also very supportive of this sweet bread teaching factory is the institution. Banyuwangi State Polytechnic is a partner that supports the acquisition of operational licenses and promotional activities in the campus environment, as well as providing healthy snacks when there are institutional activities.

3.1.9. Cost structure

Cost structure is the cost that must be incurred by the teaching factory. The costs incurred include raw material costs, namely costs for purchasing the main ingredients in making sweet bread; labor costs in the form of salaries and wages for production, sales and customer service employees; rental costs, namely the cost of renting or using space for outlets on campus; marketing and promotion are costs incurred for marketing campaigns and product promotion; and daily operational costs such as consumables.

3.2. Feasibility analysis

Investment analysis as a measure of whether a business activity is feasible from a financial point of view [9]. Analysis of the sweet bread teaching factory business is carried out to determine the feasibility of the business. This analysis is intended to determine the amount of revenue and costs and profits earned. The business cost component is a component of expenses that must be incurred from the sweet bread teaching factory business, generally calculated for one year. Production costs are the value of all production factors used, both in the form of objects and services during the production process.

3.2.1. Investment cost

Investment costs are expenditure on business activities to obtain benefits from certain activities. Investment costs are generally incurred once and only generate benefits several years later. The total investment costs incurred in the sweet bread teaching factory amounted to IDR 21,238,000.00, from asset investment of IDR 20,238,000.00, and non-asset investment of IDR 1,000,000.00. The details of the investment costs are listed in Table 1.

TABLE 1: Details of investment costs of teaching factory sweet bread.

No	Item	Unit Price (IDR)	Require-ment	Total Pri-ce (IDR)
1.	Display case	2,000,000	1	2,000,000
2.	LPG	350,000	1	350,000
3.	Mixer	4,000,000	1	4,000,000
4.	Oven	13,000,000	1	13,000,000
5.	Baking mat	13,000	10	130,000
6.	Stainless Basin diameter 26 cm	24,500	10	245,000
7.	Knife	30,000	1	30,000
8.	Grated Cheese	8,500	2	17,000
9.	Silicone Dough Rolling	22,000	4	88,000
10.	Spatula	6,000	3	18,000
11.	Oven pan	30,000	12	360,000
12.	Marketing Kit	1,000,000	1	1,000,000
	Total			21,238,000

3.2.2. Fixed cost

Fixed costs are costs that are relatively fixed in amount and continue to be incurred even though a lot or little production is obtained. The components of the fixed costs in this teaching factory are electricity, employees, business development expenses, and depreciation expenses. The details of the fixed costs are shown in Table 2.

Table 2: Details of fixed costs of teaching factory sweet bread.

No	Item	Fixed Cost		%
		1 Month	1st Year	
1	Electricity	83,333	1,000,000	3.88
2	Employees	1,800,000	21,600,000	83.73
3	Development Expenses	1,000,000	1,000,000	3.87
4	Depreciation Expenses	183,133	2,197,600	8.52
	Total	**3,066,467**	**25,797,600**	**100**

3.2.3. Variable cost

Variable costs are defined as costs whose size is influenced by the production obtained. The components of non-fixed costs in one production are direct raw and packaging materials. The projected cost of goods for the bun variant was IDR 1,274.00 / pcs, whereas that of cheese sausage bread was IDR 1,782.00 / pcs. Details of the variable costs are listed in Table 3.

Table 3: Details of fixed costs of teaching factory sweet bread.

No	Item	TOTAL	Bun Bread	Sausage Cheese
1	Direct Raw Materials	1,895,770.83	694.14	1,201.64
2	Packaging Material Cost	1,160,000.00	580.00	580.00
4	Product Name		Bun Bread	Sausage Cheese
	Sales Target (Unit)		1000	1000
	Target Profit (Percent)		50%	50%
	Projected Cost of Goods Manufactured		1,274	1,782
	Projected Selling Price		2,000.00	3,000.00

3.2.4. Revenue

The income of the sweet bread teaching factory using 1 kg of wheat flour as a raw material can produce 48 loaves of bread. For bread with bun variants sold at IDR 2,000, sausage cheese bread was sold at IDR 3,000. The monthly sales target for each variant was 1000 pcs every month. Thus, the revenue in the first year for bun bread and cheese sausage bread was IDR 24,000,000 and IDR 36,000,000, respectively. The projection

analysis results show a loss in one year of production in the first year of IDR 2,466,844. Net profit was only obtained in the second year, which was IDR 1,906,235. In the third, fourth, and fifth years, the net profits earned were IDR 6,164,418, IDR 11,472,781, and IDR 17,956,791, respectively. The projected profit and loss for five years are shown in Figure 2.

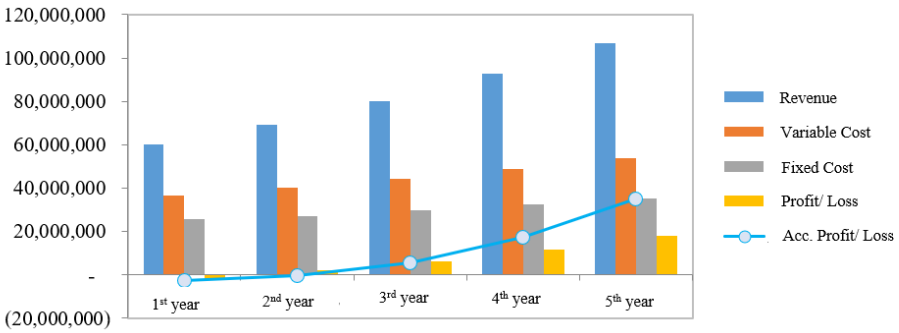

Figure 2: Profit and loss projection for 5 years.

3.2.5. Internal rate of return

Internal rate of return (IRR) was used to assess business feasibility. IRR is declared possible if the IRR is > the predetermined interest rate [10]. IRR compares the company's return on investment with the Minimum Attractive Rate of Return (MARR), which in this analysis uses the bank's appointed interest rate of 5,7 % which is the interest rate of Bank Indonesia. Based on the IRR calculation, the Sweet Bread Teaching Factory has IRR value of 53%. Given this result, a feasibility analysis of the Sweet Bread Teaching Factory is feasible. Because the IRR value of the business is worth 53%, which is greater than the previously set MARR of 5,7 % of Bank Indonesia's interest.

3.2.6. Net present value

The sweet bread teaching factory had an NPV value of IDR 85,222,327.00, which is positive in the 5th period, based on the NPV calculation from net cash flow. The ((NPV) is used to determine whether a firm is viable because its value is positive.

3.2.7. ROI

A high ROI value corresponds to a high stock price. Conversely, a low ROI value denotes a low stock price for a company. A high ROI value is a sign of a company's strong financial performance, while a low ROI value indicates weaker financial performance [11].

This study shows that the return on investment value is 217%, or the return on investment is positive. This positive ROI condition indicates that the total investment cost can be returned and a good profit can also be obtained. Thus, these results show that the value of the existing investment in the sweet bread teaching factory is acceptable and feasible.

3.2.8. B/C ratio

Benefit Cost Ratio in this study is to compare the benefit obtained in a sweet bread teaching factory and the total cost incurred [12]. The calculation of B/C ratio this business obtained 1.07. Sweet bread teaching factory deserve to be continued because it has B/C ratio of more than 1. Every costs of IDR 1,000, it bring in revenue of IDR 1,070.

3.2.9. Payback period

Based on the result of NPV that has been obtained before, it can be seen that the level of PBP Sweet Bread Teaching Factory is 41 months or 3 years 5 months. Therefore, it can be concluded that the business of Sweet Bread Teaching Factory is considered feasible because the value of the calculation of PBP is lower the number of research periods totaling 5 years.

3.2.10. Break even point

Break Even Point analysis is divided into two analyses, namely based on units and rupiah. In the BEP analysis of sweet bread Teaching Factory, the analysis is based on rupiah. BEP analysis is used to determine at what point the sales proceeds are equal to the total costs, or the business is operating in a state of no profit and no loss or profit equal to zero [13]. The BEP value in this study is IDR 5,528,669.00. The teaching factory no longer makes a profit or loses money at this point, therefore if it wants to turn a profit, sales must be higher than that threshold.

4. Conclusion

From the result of the business model, canvas helps Sweet Bread Teaching Factory understand its business environment and the interconnectedness of its nine segmentations. In feasibility analysis, it can be said developing sweet bread teaching factory is feasible. This can be seen from IRR, NPV, ROI, B/C ratio, PBP, BEP assessment indicators.

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