

Business feasibility analysis and website based e-commerce system design using system usability scale on Zauber Denim Company

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Abstract. Zauber Denim Company (Zauber) is a business that initiated by 3 (three) students from a private university in Bandung. This business is engaged in men's clothing with the main product is jeans. Zauber uses selvage denim for raw material to produce the jeans. Currently, Zauber has a location that will be an office and a warehouse of raw material and product, but Zauber can't determine how big is the demand and what kind of operational activities that can support the continuity of this business. The product will be sell using online platforms such as websites and other social media. Therefore, Zauber needs to analyst the feasibility and designing websites for this business. The feasibility analysis is carried out based on market analysis and technical and operational design. Methods used for calculated the feasibility are Net Present Value, Internal Rate of Return, and Payback Period. While for the website design, usability testing is done using the System Usability Scale. Based on the result of the feasibility analysis, this business is feasible to run by Zauber with the NPV value is 71,563,355 IDR, IRR value is 20.44%, PBP value is 4.50 years, and SUS score value is 68.92.

Keywords: Feasibility Analysis, Website Design, Usability Testing

1. Introduction

A survey conducted by the Indonesian Creative Economy Agency (Bekraf) in 2017, showed that the Gross Domestic Product (GDP) of the creative economy sector in Indonesia in 2015 increased by 4.38% from 2014 [1]. The results of the survey also show that there are three subsectors that dominate contributions, namely culinary, fashion, and crafts. Seeing this opportunity came to an idea to build a business in the fashion sector. The business in question is a business in the field of men's fashion with jeans products.

The business was initiated by 3 (three) students from a private university in Bandung. The expected target market from Zauber is male in Bandung City and is a workforce. In terms of markets, Zauber has an increased market opportunity. This is also influenced by the increasing growth of the male population in Bandung which is a workforce. Figure 1 is a graph of an increase in the number of the male population who are in the labor force in Bandung.

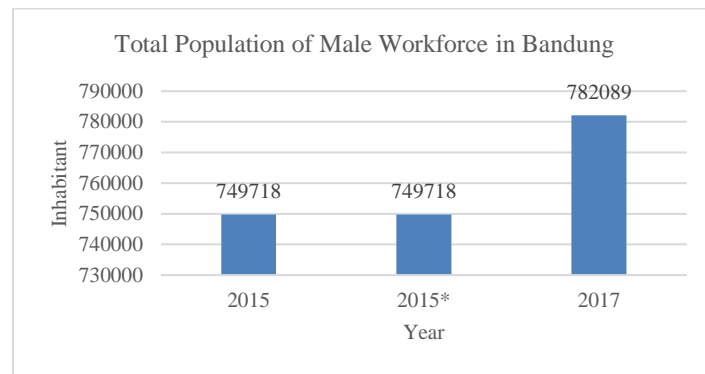


Figure 1. Total Population of Male Workforce in Bandung
(Source: Statistics of Bandung Municipality)

Other business development opportunities arise from the use of internet. At this time the world is in an age of digital development and the existence of the internet is the key in this digital era development [2]. According to an article put forward by Kompas.com in 2014, Indonesian consumers are starting to like shopping online along with the increasing internet penetration in Indonesia. According to a survey conducted by Nielsen, fashion products occupy the first position of online purchases with a percentage of 61% and consumers will look for information about fashion products through store websites by 52% [3]. By seeing these opportunities Zauber has a plan to do website-based e-commerce design in his business.

The use of the website in addition to conducting transactions can also be used as a promotional medium. The promotion is aimed at reaching a wider market and of course increasing the business profit. Based on a survey conducted by Bekraf in 2017, the website became the highest promotional media after social media with a percentage of 28.25% [1].

Based on the explanation of the problems that have been submitted, it is necessary to research about the feasibility study using parameters such as the Net Present Value, Internal Rate of Return, and Payback Period to find out whether the business to be run by Zauber is feasible or not [4]. In addition, the website design will be carried out usability testing using the System Usability Scale method because it has advantages such as being very easy to do, easily understood by participants, the samples used are not many, and the results are reliable and valid [5].

2. Methods

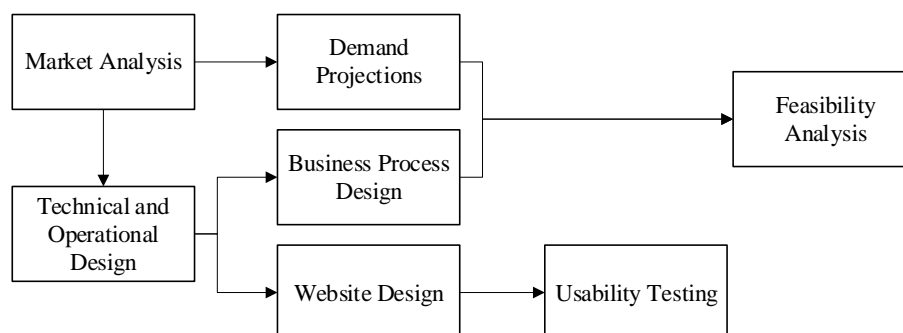


Figure 2. Research Methodology

This study aims to determine the feasibility of a business and measure the level of usability on the website used. In the market analysis section, calculations are performed to determine how many the demand projections. Based on market analysis, technical and operational design is then carried out.

Technical and operational design includes business process design and website design, which will then be done a usability testing using the SUS (System Usability Scale) method to find out what the score from the usability test is. The results of the projected demand and business processes will be used as benchmarks to analyze the feasibility using the NPV (Net Present Value), IRR (Internal Rate of Return), and PBP (Payback Period) methods to find out whether the business that will be run is feasible or not.

3. Result and Discussion

There are several limitations of the problem in this research, such as the feasibility analysis reviewed based on market aspects, technical aspects, and financial aspects, interest rates, inflation, taxes, and other economic conditions considered stable and normal, and the feasibility analysis period is carried out for the next 5 years (2020 till 2024).

3.1 Market Analysis

Market analysis is done by measuring the market into market criteria to facilitate market determination [6]. There are three types of market breakdown consist of potential markets, available markets, and target markets. Potential markets are a group of consumers who have an interest in a particular type of product. An available market is a group of consumers who have the interest and ability to buy a certain type of product. While the target market is a group of consumers targeted by the company. The determination of the market breakdown was carried out by conducting a survey involving 101 male respondents of the workforce in Bandung. The results of the three types of market breakdown can be seen in Table 1.

Table 1. Market Breakdown

Market Breakdown	Percentage	Product Quantity (pcs)
Potential Market	49%	379,429
Available Market	47%	177,818
Target Market	0.6%	1,102

(Source: Data Processing)

Based on the Table 1 it can be seen that with a potential market percentage of 49%, the product quantity is 379,429 pcs. The available market which is part of a potential market has a percentage of 47% with a product quantity of 177,818 pcs. The target market is part of the available market that is the target of the company. Taking into account competitors for similar products and the ability of this business to meet demand, the target market percentage is 0.6% with a product quantity of 1,102 pcs. After knowing how many target markets to go to, the next step is to calculate the number of projected requests. The results of the calculation of demand projections can be seen in Table 2.

Table 2. Demand Projections

Product Categories	Product Quantity (pcs)				
	2020	2021	2022	2023	2024
Skinny Fit	474	484	494	505	516
Slim Fit	411	420	429	438	447
Straight Fit	217	222	227	232	237
Total	1,102	1,126	1,150	1,175	1,200

(Source: Data Processing)

Based on the Table 2 it can be seen that every year there is an increase in demand. This happened because it was assumed in this study that there was an increase of 2.16% every year following the increasing population (Male Workforce in Bandung).

3.2 Technical and Operational Design

Zauber is a fashion start-up business. The concept that was initiated by Zauber to go about his business is an online shop. Therefore, it is necessary to design business processes to find out what activities need to be carried out and also website design as a sales medium.

3.2.1 Business Process Design. Business processes that occur during the year consist of five activities, namely product designing, raw materials and packaging purchasing, production activities, marketing activities, and managing customer orders. Because activities in business processes are always the same every year, the time needed for each business process will be the same, except the process of managing customer orders. The time needed for each business process that occurs can be seen in Table 3.

Table 3. Business Process

No	Activities	Time Requirements (hour)				
		2020	2021	2022	2023	2024
1	Product designing	72.00	72.00	72.00	72.00	72.00
2	Raw material and packaging purchasing	4.84	4.84	4.84	4.84	4.84
3	Production	11.77	11.77	11.77	11.77	11.77
4	Marketing	225.34	225.34	225.34	225.34	225.34
5	Managing customer orders	425.64	432.03	438.82	445.90	453.38
Total		743.92	750.31	757.10	764.18	771.66

(Source: Data Processing)

Based on the Table 3 it can be seen that in business processes managing customer orders the time required each year is different. In one process managing customer orders takes 0.69 hours or 41 minutes 35 seconds. Changes in processing time requirements for managing customer orders are affected by the number of transactions that occur based on demand projections.

The result from Table 2 and Table 3 are used for identifying the needs of raw material, workforce, facility, and production process that used for run this business. Furthermore, operational cost will be calculated and calculate how much the needs of investment cost to start this business then it is used as a feasibility calculation.

3.2.2 Website Design

Data Flow Diagram (DFD) can model the logic of a system without considering where the data flows. There are three levels in DFD, namely Context Diagram, DFD Level 0 and DFD Level 1 [7]. Figure 3 is the Context Diagram and Figure 4 is the DFD Level 0 of Zauber’s website.

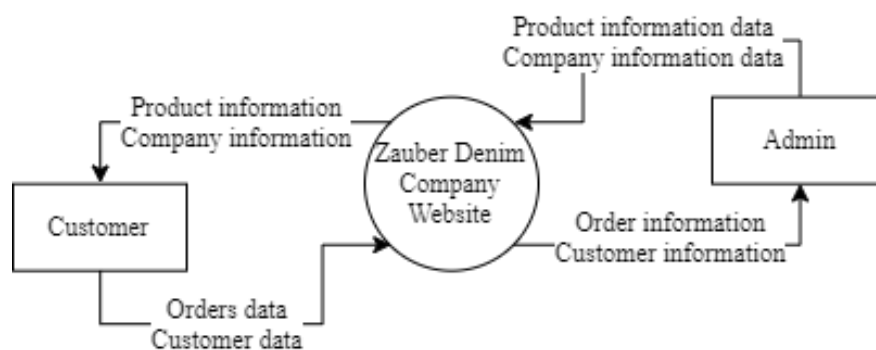


Figure 3. Context Diagram

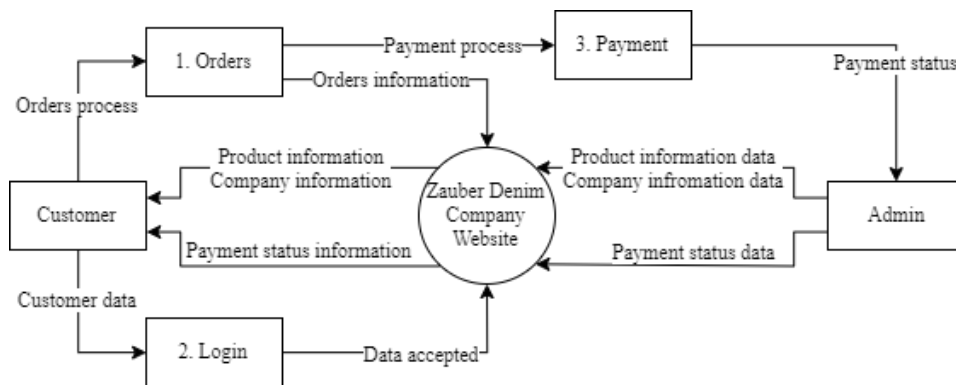


Figure 4. DFD Level 0

In the Figure 3 model that on the Zauber’s website there is an exchange of data between the customer and admin. While in Figure 4, it models the details of the Context Diagram and contains where the data is stored. Next, is the design using Use Case Diagram. Use Case Diagram can model the behavior or activities expected of the use of the system by actors (system users) [8]. There are two main actors in the Use Case Diagram designed, namely customers and admins with different activities. Figure 5 is the Use Case Diagram of Zauber’s website.

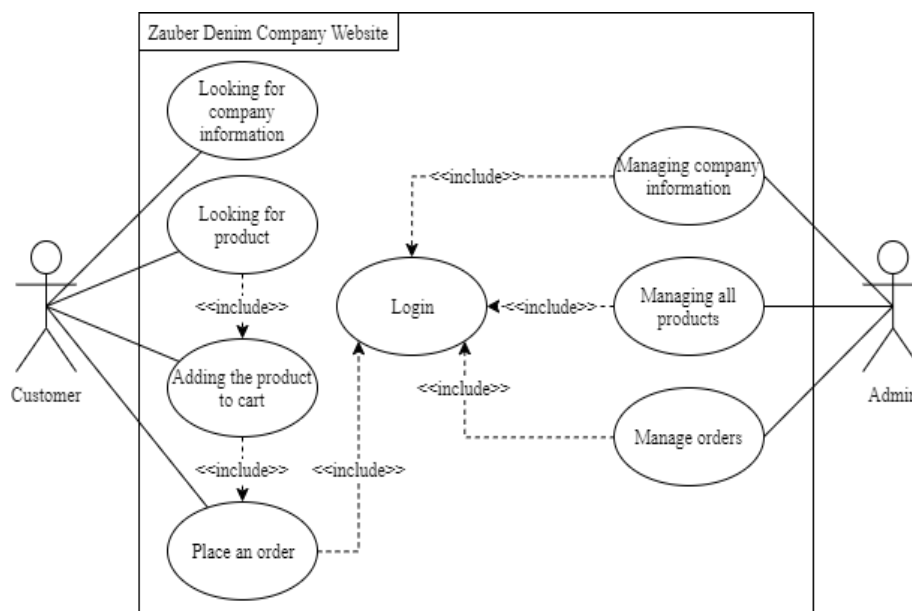


Figure 5. Use Case Diagram

Entity Relationship Diagram (ERD) is a technique for modeling the data needed by a system, modeling it then becomes the basis for designing a database [9]. In an ERD there is a cardinality that describes the relationship from one entity to another. Figure 6 is the ERD of Zauber's website.

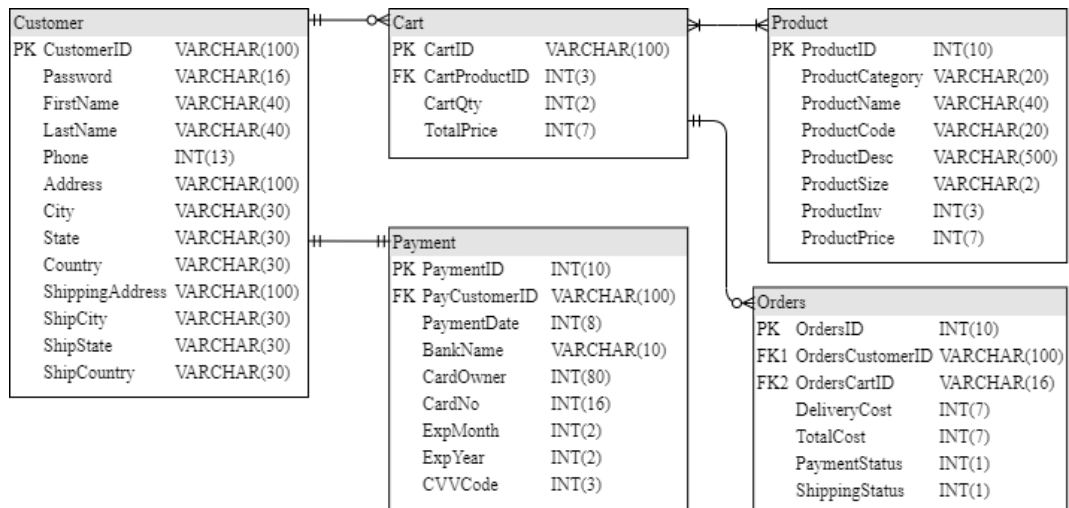


Figure 6. Entity Relationship Diagram

3.3 Usability Testing

After designing and building the website, the usability testing is then performed. In this study, the method used is the System Usability Scale (SUS). By using this method, testing will be done by conducting a survey using a questionnaire involving 30 respondents. Before the respondent completes the questionnaire, the respondent is asked to do a number of task scenarios that must be run on the system (website) which can be seen in Table 4.

Table 4. Task Scenario

No	Scenario
1	In this task, you are asked to purchase one of the products that sold on the website.

After completing the questionnaire, the next step is to calculate the average SUS score obtained to measure the level of satisfaction. Scores obtained from filling out the questionnaire showed varied results. If the results are grouped from scores ≤ 40 to 100 with a range of 10 scores, the frequency distribution of the scores can be seen in Table 5.

Table 5. Frequency Distribution of SUS Score

SUS Score	Frequency Distribution
≤ 40	2
41 - 50	1
51 - 60	4
61 - 70	9
71 - 80	9
81 - 90	3
91 - 100	2
Total	30

(Source: Data Processing)

The results of calculating the average score obtained from the usability test for the Zauber's website are 68.92. With this value, the level of user-friendliness of the Zauber website is at C grade. That means, the user-friendliness of the Zauber website is rated "Good" [10].

3.4 Feasibility Analysis

The feasibility calculation in the Table 6 shows the final results of NPV, IRR, and PBP values.

Table 6. Feasibility Calculation

Methods	Value
NPV	71,536,355 IDR
IRR	20.55%
PBP	4.50

(Source: Data Processing)

Based on the Table 6 it can be seen that the NPV has a positive value, which is 71,536,355 IDR. The value of IRR is 20.44%, with that value IRR has a greater value than the MARR used in this study, which is 9.95%. Other than that, the value of PBP is 4.50 or the payback period is around 4 years 6 months. These three results indicate that the business to be undertaken by Zauber is feasible to run.

4. Conclusion

Based on the results of calculations and analysis, this study draws the following conclusions:

Demand projections calculated for in 2019 amounted to 1,102 pcs products with three product categories, there are skinny fit jeans, slim fit jeans, and straight fit jeans. The number of demand will be increased by 2.16% in the following years.

The business processes that have been designed for Zauber consist of product designing, raw material and packaging purchasing, production activities, marketing activities, and managing customer orders. The time needed for the entire business process in 2020 is 743.92 hours and increasing every year.

The average SUS score is 68.92 and with this value, the user-friendliness level of Zauber's website is at C grade or means as "Good" rated.

The business to be run is feasible. That is because the results of the calculations show a positive NPV value, which is 71,563,355 IDR, an IRR greater than MARR (20.44% > 9.95%), and with a PBP value of 4.50, which means this business will experience a PBP of around 4 years 6 months ahead.

Zauber Denim Company is suggest to start this business because of the research results show that this business idea is feasible.

For future research, it is recommended to do a risk analysis when this business is run.

5. References

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