

# Feasibility analysis and website design of Najwa Collections fashion products

M Murfi<sup>1</sup>, E Chumaidiyah<sup>2\*</sup>, and W Tripiawan<sup>3</sup>

Industrial Engineering, Telkom University, JL. Telekomunikasi 1 Bandung, Indonesia

<sup>1</sup>meuthiaamurfi@gmail.com, <sup>2</sup>endangcn@gmail.com

\*Corresponding Author

**Abstract.** E-commerce is one of the economic activities supported by Internet infrastructure with extensive segmentation and implementation. With data showing Internet users and shopping interest of Internet users, of course, this will be an opportunity for Small and Medium Enterprises (SMEs) to use information technology for business progress so that they can do marketing towards the global market. Najwa Collection is one of the women's clothing industries in Bandung and has been established for ten years. It will conduct online business development with e-commerce systems to increase profits and develop market potential in the meantime. The purpose of the feasibility calculation on the development of this system is to find out whether the business that will be developed from offline to online is feasible to run. Besides, there is a website system design from benchmark results for the online sales process. Next, the feasibility analysis calculation is obtained based on the financial, technical and market aspects developed. The final result of the feasibility analysis is NPV of Rp. 945,048,053. PBP values obtained are four years with an IRR of 32%, which is feasible to run because of  $IRR > MARR$  (10.50%).

**Keywords:** E-Commerce, Feasibility Analysis, NPV, IRR, PBP, System Design

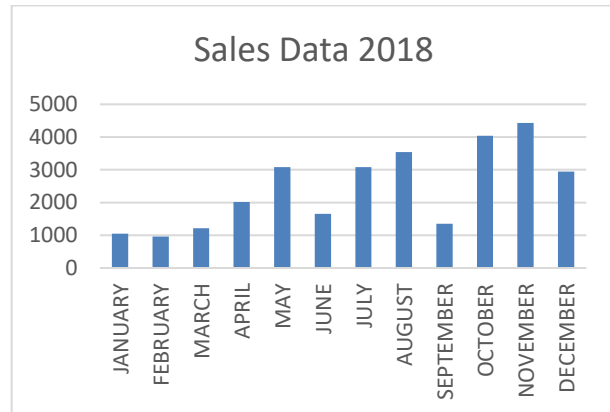
## 1. Introduction

Nowadays, the era of globalisation has brought many changes to human life. One of the changes that occurs is the existence of technology that continues to develop. A computerised global technological revolution causes the movement of information to become free and able to cross wide borders. Of course, the Internet and global computer networks enable the development of globalisation by developing technological infrastructure for the advancement of the global economy [1]. New emerging technologies such as computers, the Internet, social networks have become parts of everyone's life regardless of age or gender [2]. And of course, we cannot deny that the existence of the Internet is now a key and milestone [3]. Even in Indonesia alone, based on e-Marketeer data, Internet users have reached 105.4 million, and Indonesia is ranked the 6th in the world with the most internet users. Information technology is also used to run a trading business that is often known as e-commerce [4]. In Indonesia, e-commerce has become one of the economic activities supported by Internet infrastructure with extensive segmentation and implementation [5].

According to research from the Indonesian E-commerce Association (idEA), Google Indonesia, and TNS (Taylor Nelson Sofres), the market value in Indonesia in 2013 reached Ro 94.5 Trillion and predictions for the next three years, i.e. in 2016 will reach threefold, reaching Rp 295 trillion. Besides, from the research conducted by the Indonesian E-commerce Association (idEA), the most online shopping interest is in fashion products. The following is data taken from the Indonesian E-commerce Association (idEA), the most purchased product at an online store in 2014.



**Figure 1.** Goods purchased at online stores  
(Source : ideA)

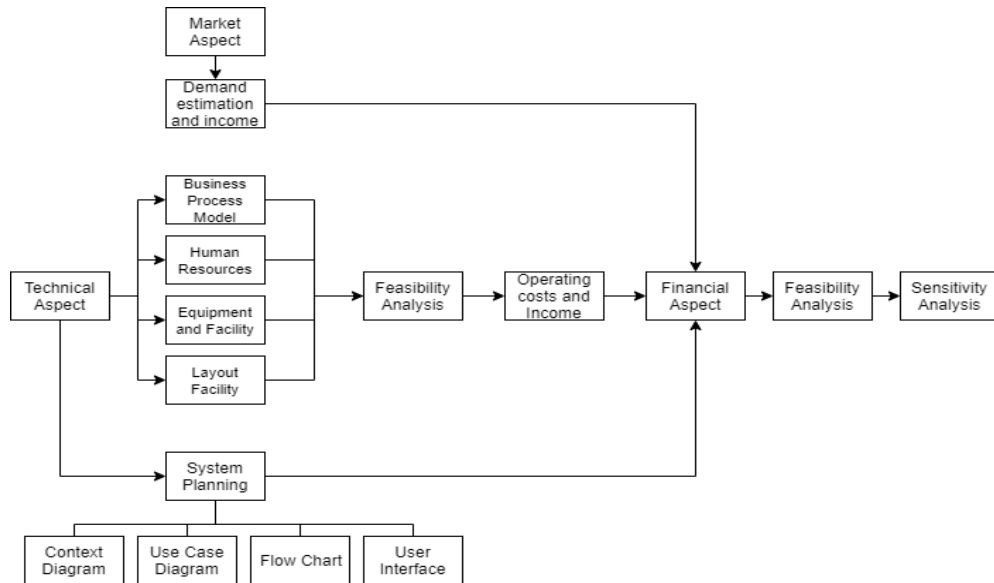


**Figure 2.** Sales Data for 2018  
(Source : Owner Data)

Data displayed from idEA is as much as 78% of shopping interest in Internet users, namely in fashion products. In Indonesia, informal small businesses are still conventional in their businesses, considering several aspects, such as production and marketing [6]. With data showing Internet users and the shopping interests of Internet users, of course, this will be an opportunity for Small and Medium Enterprises (SMEs) to use information technology for business progress so they can do marketing towards the global market [7]. Najwa Collection is one of the businesses engaged in the fashion business in Bandung and has been established for ten years.

The sales data show that in 2018 the increase and decrease that were not certain. This was due to the lack of market share, proper marketing, and it depended on the conditions of demand and the market at that time. The owner will develop an online business to increase profits and develop current market potential. However, the implementation of an e-commerce business requires a relatively mature concept. Based on the data from CB Insights, 42% of startups fail because of market needs that are not taken into account in advance. Besides, the failure of startups is due to the calculation of the costs incurred or not appropriate and problems with marketing. Therefore, a feasibility analysis is needed to assess whether the development of e-commerce business in Najwa Collection is feasible to run or is not feasible based on market, human and financial aspects. In addition to taking into account the feasibility of developing an e-commerce business, this research will also display the flow of information systems that suit the business needs. In the business world, a website in the form of e-commerce is a necessity for a business for business development because there are various benefits that e-commerce has [8].

**2. Methods**



**Figure 3. Research Methodology**

This study covers the market, technical, and financial aspects. The market aspect determines how future demand and income are based on the existing demand and income estimates. The technical aspects include how to model the current and new business processes, the addition of human resources, the understanding of equipment and facilities and facility layouts. As this research concerns the feasibility of e-commerce, there is an addition to the design of the system in technical aspects where the design of this system includes context diagrams, case diagrams, flow charts and user interfaces of e-commerce to be formed. Results from the market and technical aspects are estimates of the financial aspects which will then be projected as a feasibility analysis for the formation of e-commerce. The final result of the financial aspect is the calculation of IRR (Internal Rate of Return), NPV (Net Present Value), PBP (Payback Period), and sensitivity analysis. After conducting several markets, technical and financial investigations, decision making is an important part of the final process of feasibility analysis [9].

**3. Result and Discussion**

*3.1 Forecasting*

As historical data shows that the data patterns shown are cyclical, the forecasting for products A and product B uses the Weight Moving Average, Simple Moving Average, Double Moving Average, Simple Exponential Smoothing and Double Exponential Smoothing methods. The results of forecasting calculations will be shown in Appendix B. The following is the result of forecasting demand for product A and product B using the selected method, namely Double Exponential Smoothing @ 0.3:

In Table 1 below shows the results of forecasting calculations using the Double Exponential Smoothing @ 0.3 method on product A

**Tabel 1.** Double Exponential Smoothing

Period (t)	d(t)	S'(t)	S''(t)	S'(t) - S''(t)	a	b	d'(t) = a+bm	e	e <sup>2</sup>
1	495	495	495	0	495	0,0	495	0	0
2	450	482	491	-9	472	-4,1	468	18	324
3	598	516	499	18	534	7,7	542	-56	3142
4	798	601	529	72	673	30,7	703	-95	8981
5	1909	993	669	325	1318	139,2	1457	-452	203955
6	885	961	756	205	1165	87,7	1253	368	135548
7	1549	1137	871	267	1404	114,3	1518	-31	938
8	1118	1132	949	183	1314	78,3	1392	274	75334
9	678	995	963	33	1028	14,0	1042	364	132554
10	1303	1088	1000	87	1175	37,5	1213	-90	8169
11	949	1046	1014	32	1078	13,7	1092	143	20426
12	956	1019	1016	4	1023	1,5	1024	68	4639
AMOUNT									594010

(Source: Data Processing)

Based on table 1. above the formula  $d'(t) = a + bm$  is used to calculate demand projections for the coming year on product A and product B. Then, do the test by calculating the MSE value of 49501 obtained from the results of the squared error in product A and 38154 in product B. This method was chosen because it has the smallest MSE value compared to the results of other methods. MSE results for each period are shown in the table below.

**Tabel 2.** MSE Results

METHOD	MSE (Product A)	MSE (Product B)
WMA	101251	82587
SMA 2	202839	169220
SMA 3	194350	147454
SMA 4	217980	161534
SMA 5	64516	45737
DMA 2X2	258525	227200
DMA 2X3	189493	135782
DMA 3X3	86934	71317
DMA 3X4	51140	38386
SES $\alpha = 0,1$	266239	218870
SES $\alpha = 0,2$	221955	175894
SES $\alpha = 0,3$	207634	162269
DES $\alpha = 0,1$	140342	107848
DES $\alpha = 0,2$	84152	62916
DES $\alpha = 0,3$	49501	38154
MIN	49501	38154
SELECTED METHOD	DES $\alpha = 0,3$	DES $\alpha = 0,3$

(Source: Data Processing)

Furthermore, after obtaining the selected method for each product by using the Double Exponential Smoothing @ 0.3 methods, the demand forecast for the next period was calculated by using the formula  $d'(t) = a + bt$  to determine the forecast of product demand for the year 2019. In this forecasting, it is assumed that a 16% increase is obtained from katadata.co.id on the projections of Indonesian digital buyers in 2017 and 2018. The table below shows sales targets based on demand forecasting:

**Tabel 3.** Product Sale

YEAR	2019	2020	2021	2022	2023
Product A Sales Amount	13346	15497	17995	20896	24264
Product B Sales Amount	13859	16093	18687	21699	25197

(Source: Data Processing)

### 3.2 Technical Aspect

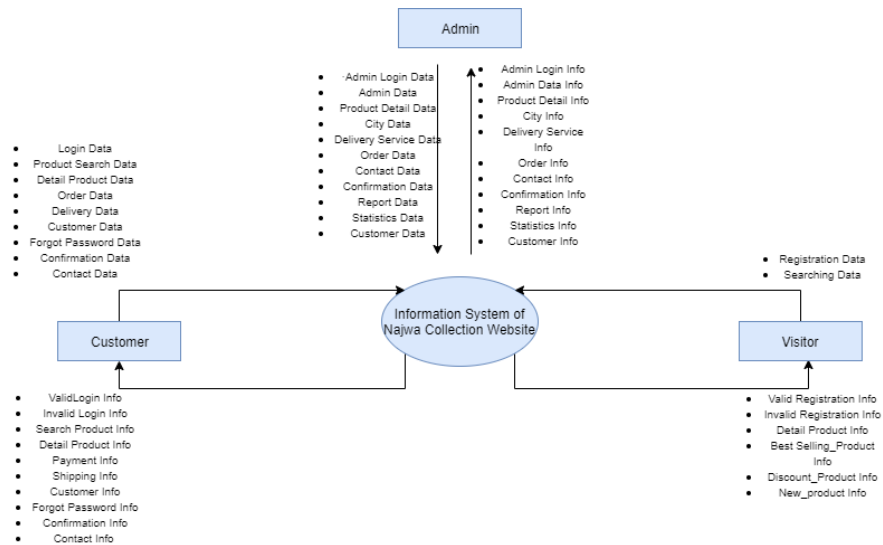
Collection of existing labour data to find out the needs and criteria are needed in adding the number of workers to Najwa Collection in developing the business into e-commerce. Of course, this can affect the number of workers in the field of production. At present, the workers owned in the area of production consist of 6 tailors, two cloth cutters, five packers, and two shop keepers. So, the current total number of employees at Najwa Collection is up to 15 people. The following is a picture of the number of workers until 2023:

**Tabel 4.** The Amount of Labor

No	Labor	Amount					
		2018 (Existing)	2019	2020	2021	2022	2023
1	Admin	0	1	1	2	2	2
2	Packaging	0	1	1	1	1	1
3	Marketing	0	1	1	1	1	2
4	Tailor	6	6	7	7	8	8
5	Fabric Cutter	2	2	2	2	2	2
6	Sequin + Packing	5	5	5	5	5	5
7	Shopkeeper	2	2	2	2	2	2
Sum		15	18	19	20	21	22

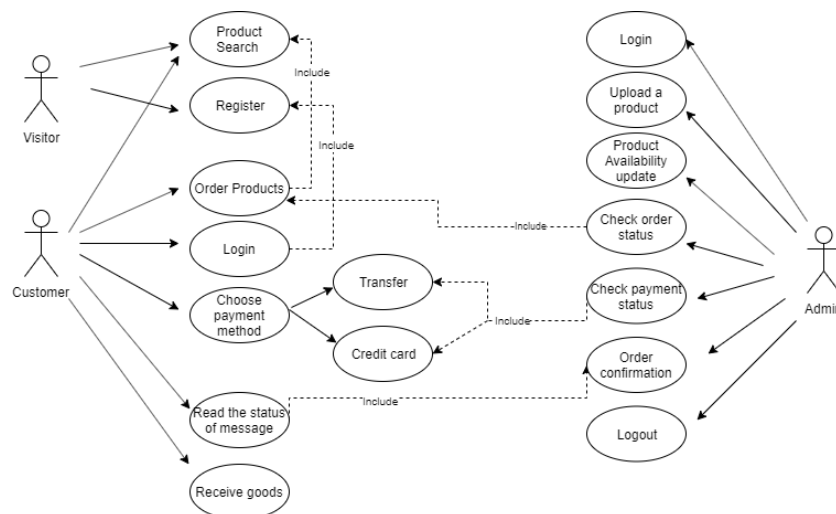
(Source: Data Processing)

Besides, the technical aspect shows the design of e-commerce systems based on data collection and the needs of the website and also carries out benchmarks with similar e-commerce websites. The picture below shows that Data Flow Diagram Level 0 or Context Diagram is the highest in DFD, describing one large circle that can represent the entire process in the system [10].



**Figure 4.** Context Diagram

The data flow diagram above explains how the input from the actor to the system, as well as the output from the system to the actor. In the customer section, it can be seen that they will input the login data to the system to make payments after completing the order. Admin will login to the system to input product data and product information for customers and visitors. Besides, the admin can find out reports from the website, website visitor statistics, and data from customers. The part of visitors can only do a product search. If visitors are interested in the product and will make an order, visitors can do the registration; then the system will display product information in the form of best-selling, discounted and latest products. After the visitor registers, the system will output in the form of valid and invalid registration information. Next is the use diagram. Use case diagrams are patterns of interaction between actors and systems, whereas actors can be human actors or non-human actors [11].



**Figure 5.** Use Case Diagram

In Figure 5. is a use case diagram that explains how each actor can carry out his activities on the website and how the relationship of activities between actors. Among these activities, there are included, the intention is the use case related to carrying out its functions requires another use case. For the login process, of course, you have to go through the registration process first. The product ordering process is also carried out after searching for the product. Admin activity to check the status of payment, of course, in the previous activity the customer has chosen the payment method either by transfer or credit card. In the admin section when doing an activity check the status of the order, after the customer does the product order activity. Other activities when the customer will do the activity of reading the status of the message, of course, the admin does the order confirmation activity first. And for the login process, of course, you have to go through the registration process first.

### 3.3 Financial Aspect

The calculation of financial aspects shows the calculation of the final results with NPV, IRR, and PBP values in Table 5 below.

**Table 5.** Financial Aspect

Interest Rate	10,50%
NPV	Rp 945.048.053
IRR	32%
PBP	4

The table shows the NPV value of Rp. 945,048,053.00. IRR value of 32% where the IRR value is greater than the MARR value of 10.50%. And PBP of 4 years for the return value. This shows that the development of e-commerce business in Najwa Collection is feasible to run. The calculation of the sensitivity analysis in this study consists of two variables, namely an increase in direct material costs and a decrease in the selling price of the product. The increase in direct material costs is still relatively safe if it reaches 6%, but if it occurs up to above 6.21%, it will cause a negative NPV. For a decrease in the selling price of products, it will be classified as safe if it reaches 4.8%, and the NPV will become negative if it decreases by up to 5%.

## 4. Conclusion

Based on the results of calculations and analysis, the findings of the development of the Najwa Collection e-commerce business are as follows:

From the results of each product calculation using several methods, the chosen method is double exponential smoothing @ 0.3 because it has the smallest MSE value. After calculating the forecast results for 2019, the following year results were then calculated with an increase of 16% obtained from the increase in the number of digital buyers.

New facilities to support the running of the business are added, so the total investment owned by Najwa Collection is Rp 195,809,000. Then the addition of new workforce positions is an admin with one person, one person packaging, and one person marketing. And the addition of tailor labour began in 2021 due to the addition of the volume of the number of products.

Designing a website requires experts in making websites. The cost required to create a website is Rp. 45,000,000.00 outside of the domain and hosting fees. Domain and hosting payments are done once a year. Besides, there are software maintenance costs incurred every month in the amount of Rp. 800,000.00.

The NPV value for investment development is IDR 945,048,053, PBP for four years and IRR value of 32% > MARR. From the results of the calculation of the sensitivity analysis, the increase in sensitive materials is up to 6.21%, but if the NPV value becomes negative when the sensitivity reaches 7%. On the

sensitivity of the decline in product prices, sensitive up to 4.8%, and the NPV value will be negative when the selling price of the product decreases to 5%. This, of course, will affect the feasibility of the business.

Based on the feasibility calculation, the suggestion from the author for the development of the e-commerce business Najwa Collection is feasible to run. Companies need to pay attention to the risks of online business including intense competition between other online businesses, marketing systems that are not properly considered, and unmet market demands.

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