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ANALYSIS AND DESIGN OF KOREA MERCHANDISE SALES SYSTEM (CASE STUDY IN SUEWEETIESID)

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Abstract— The design of the sales system in Sueweetiesid is based on the fan club of Korean artist Bae Suzy who wants Korean merchandise, started using social media to promote and offer it to various consumers, consumers who want to buy goods sometimes have to wait long because the admin must input order data one by one especially when booking very high, this is certainly very ineffective, in the design of this application using UML as a method used and needed analysis to see the tendency that occurs through SWOT analysis method, and the results obtained this design into a proposal for application development and analysis results obtained relationship by OW, WT, TS, and OS.

Keywords— SueweetiesID, Merchandise, Analytical Hierarchy Process, SWOT.

I. INTRODUCTION

As technology continues to grow rapidly today, a system consists of various complementary elements in achieving goals and objectives [1]. Then the system has become a necessity in almost all aspects of life [2]. The elements contained in the system that is called the subsystem. The subsystems must be interconnected and interact through the relevant communication so that the system can work effectively and efficiently the development of technology in the modern era is now progressing very rapidly, where everyone can meet the sharing of technology in various fields around human life that is wrong the only thing is with the existence of information technology. Information technology is a tool that can provide an information to users to obtain data or information that can support the accuracy in making decisions by using appropriate technology. Information technology today has a tremendous impact on all areas such as business [3]. Sales and purchases are an important cycle in a business process. Whether in a service company or a trading company, sales are a treasure to earn money, and purchases are what support the sales process. Then, recording sales and purchases made using the help of software is easier than done manually. Therefore, the accounting information system of sales and purchases used must be eligible. As a good system, accounting information system sales and purchases can accelerate the record, store, process, and generate information in the form of reports required company [4]. SueweetiesID is a business selling a wide range of Korean merchandises in Jakarta and is a fan base of Bae Suzy's fan base for information as well as on the artist's life schedule, as well as a trendsetter for fans. This business begins using social media to promote and offer it to various consumers, consumers who want to buy

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goods sometimes have to wait long because the admin must input data orders one by one especially if the order is very high, this is certainly not effective. From these problems, it is necessary to design a system that can facilitate the consumer to perform these transactions in order to help facilitate in inputting data orders and data items available, can improve the efficiency of time so that consumers can order goods in want easily without waiting long.

A. Research Problems

Based on the background described above, then the outline of the problem is:

1) How to design Korean Merchandise Sales application in SueweetiesID?
2) How are the weaknesses, strengths, opportunities, and threats in designing the Korean Merchandise Sales system in SueweetiesID?

B. Limitation of Research

In order for the research to be conducted is not too widespread, there are limits to this research:

1) System Provides Information on merchants and products offered.
2) System Provides Information on price and availability of goods sold.
3) Booking done if it has become a member
4) Payment method using Bank Transfer only
5) The analysis in this study using SWOT Method
6) Assumption criteria used in Algorithm AHP only Excellence, Very Good, and Good as a requirement for the product favourite
7) The assumption on sub criteria using 5 products on the bracelet category
8) The assumption to calculate the favourite product is to use 100 people who have given ratings on the bracelet category

C. Purpose and Objectives

In this research is to know how to design Korean Merchandise Sales application in SueweetiesID, and to know the strengths, weaknesses, opportunities, and threats in the design of Korean Merchandise Sales system at SueweetiesID.

II. THEORY FUNDAMENTAL

A. Previous Research

As an effort made to this research, to identify the methods that have been done. In order to know the application of methods created by others approaching this research. So here are some studies that are close to the research that will be discussed. The results of M. A. Sudarsono and Krisnawati showed that to design and build Android Based Applications required some software and hardware, starting from system analysis to design the process of this application [5]. Research A. Putranto explained based on the SWOT matrix, Regina Pacis High School Bogor can use the strengths to obtain opportunities. The way that can be done by SMU Regina Pacis Bogor, among others: make improving the competence of students and teachers by using existing facilities and technology; developing innovative learning methods by utilizing existing information technology channels (e-learning) and improving the quality of learning for students and teachers obtained from the technology channel [6]. Other research Y. Astuti and D. I. Fahmasari Pinter Java website provides feature article posting for member Pinter Java website that can be used to exchange information about Java Culture, and So people who will learn Javanese culture do not need to come directly to the island of Java [7]. From the previous research that has been described then it is necessary to develop to design sales applications in the analysis with SWOT, that is by adding feature product ranking into application design.

B. System Definition

The system is a network of interconnected procedures, gathered together to perform an activity or to complete a particular goal [8]. The system can also be defined as a set or set of organized elements, components, or variables, interdependent with each other, and integrated a system consisting of parts or components integrated for one purpose [9]. Meanwhile, according to Sutarman System is a collection of elements that are interconnected and interact in one unity to run a process of achieving a major goal [10].

C. Characteristic System

A system has certain characteristics or properties, which have components, system boundaries, environment outside the system, connectors, inputs, outputs, processors and targets or objectives [11].

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Here are the characteristics:

1) System Components

A system consists of a number of interacting components, which means working together to form a unity. System components or system elements can be either a subsystem or parts of the system. Each subsystem has the characteristics of a system that performs a particular function and affects the overall system process.

2) System Restrictions

Limit system is the area that limits between a system with other systems or with the environment outside. This system boundary allows a system to be viewed as a whole and shows the scope of the system.

3) External Environment System

The external environment of a system is beyond the limits of the system that affect the operation of the system. The external environment of this system can be both beneficial and detrimental. The favourable external environment is the energy of the system and thus must be maintained and maintained. While the adverse external environment must be retained and controlled, otherwise it will interfere with the viability of the system.

4) System Liaison

Liaison is a medium that connects between one subsystem with other subsystems. Through this link allows resources to flow from one subsystem to another. The output from one subsystem will be input to other subsystems through the link. With connecting one subsystem can integrate with other subsystem form one unity.

5) System Input

System input is the energy that is put into the system. Inputs can be maintenance input and signal input. Maintenance input is the energy entered so that the system can run. Input signal is the energy that is processed to get the output from the system.

6) System Output

System output is energy that is processed and classified into useful output. Output can be input to other subsystems.

7) Processing System

A system can have a processing section or system itself as a processor. The processor will convert the input into output.

8) Target System

A system must have a purpose or a target, if the system does not have a target then the system will not exist. A system is successful if reach it target or their purpose. Goals are very influential on the input and output generated.

D. Definition of Sales

Sales is an activity aimed at finding buyers, influencing, and providing guidance so that purchases can match their needs with the offered production and enter into agreements on prices that benefit both parties. The point is this understanding of sales is a favourable agreement between the buyer and the seller [12].

E. Decision Support System

The Decision Support System (DSS) is an interactive computer-based system that helps decision makers to use data and models to solve unstructured problems [13].

F. UML

UML (Unified Modelling Language) is one of the most widely used language standards in the industry to define needs, create analysis & design, as well as describe the architecture in object-oriented programming [14]. Other definition Use Case Diagram is a UML (Unified Modelling Language) diagram model used to describe the expected functional agreement of a system. Use Case is always made first, but another sequence of diagrams is created depending on the project and personal preferences of analyst [15].

G. Analytical Hierarchy Process Algorithm

Analytical Hierarchy Process (AHP) [16] was developed by Prof. Thomas Lorie Saaty (1998) from Wharston Business school to seek ranking or priority order of various alternatives in solving a problem. In everyday life, one is always faced with the choice of alternatives. Priority determination and consistency test are required on the options that have been made. In complex situations, decision-making is not influenced by just one factor but multi-factor and encompasses both levels and interests [17]. Basically, AHP is a general theory of measurement used to find the scale of ratio of both discrete and continuous pairwise comparisons. These comparisons can be drawn from the actual size or base scale reflecting the strength of feelings and relative preferences. Some principles in solving problems with Analytical Hierarchy Process (AHP) [18]:

1) Determining the hierarchy
2) Determining the priority of the elements by making pairwise comparisons
3) Synthesis

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4) Measuring consistency Λmaks.... [16]
5) Calculate index consistency CI = (Λmaks - n) / (n - 1)..... [16]
6) Calculate the index ratios CR = CI / IR..... [16]

H. SWOT Analysis

Business can be identified by using analysis to identify strengths, weekness, opportunities, and threats that can be identified by SWOT analysis. SWOT analysis compares between external Opportunities and Threats factors with internal Strength and Weakness factors [19].

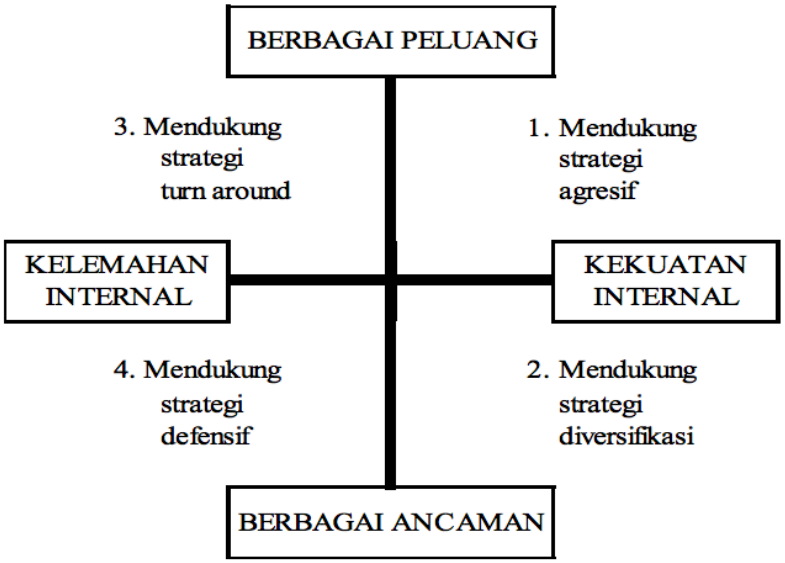

Figure 1 SWOT Analysis Quadrant

III. METHOD

A. Business Process Current System

Here is the current business process in Sueweetiesid that can be described in figure 1.

Figure 2 Business Process Current System

Figure 2 describes the current sales process flow, which has 4 simple processes. System to be designed [20] using the current business process and currently run by using social media as the basis of ordering, and merchandise selection can be done by choosing promotions in the post on social media, then can make payment via bank ATM transfers, and if already successfully make payment of goods will be sent to the customer's location immediately.

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B. Use Case Diagram

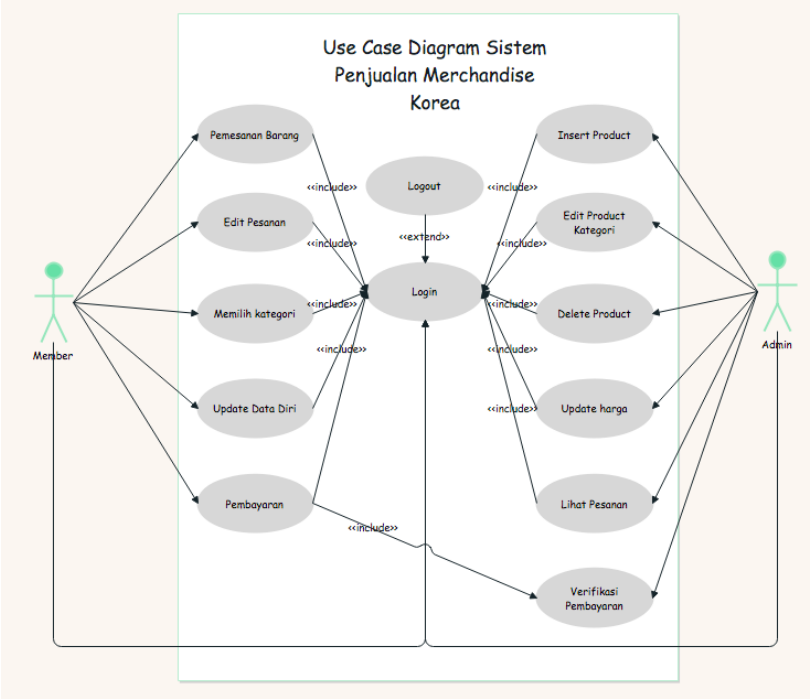

Figure 3 Use Case Diagram

Figure 3 describes in use case there are 2 actors namely member and admin, interaction in the system described member and actor can perform certain activities in ordering and updating goods sold by admin.

C. Activity Diagram

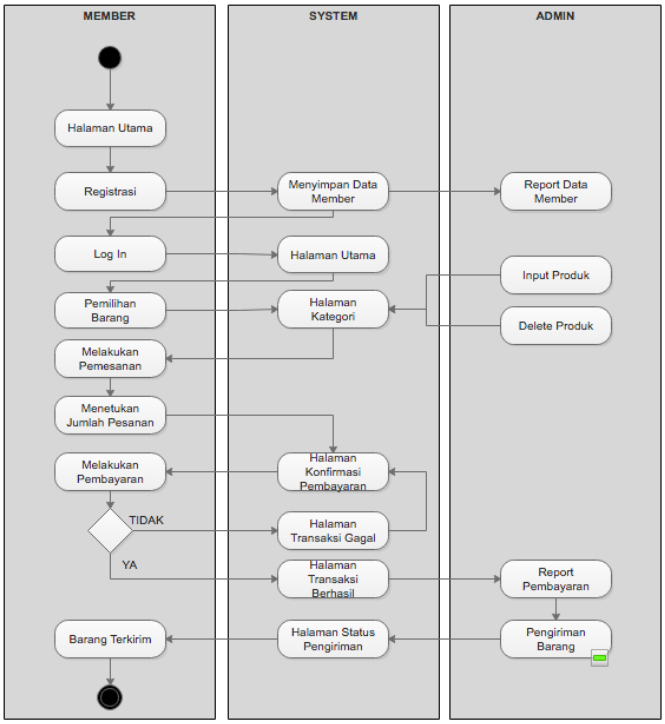

Figure 4 Activity Diagram

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Figure 4 Explaining the activity flow of the three actors for the design of this application, referring to the process flow of figure 2, the activities performed will be the reference for creating the application.

D. Sequence Diagram

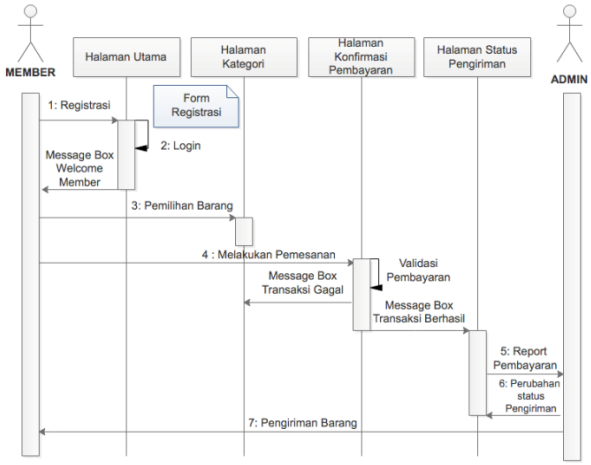

Figure 5 Sequence Diagram

Figure 5 explains the sequence flow in the purchase process of this application, by explaining the interaction with the administrator member of the application, by displaying on every page of each activity.

E. Class Diagram

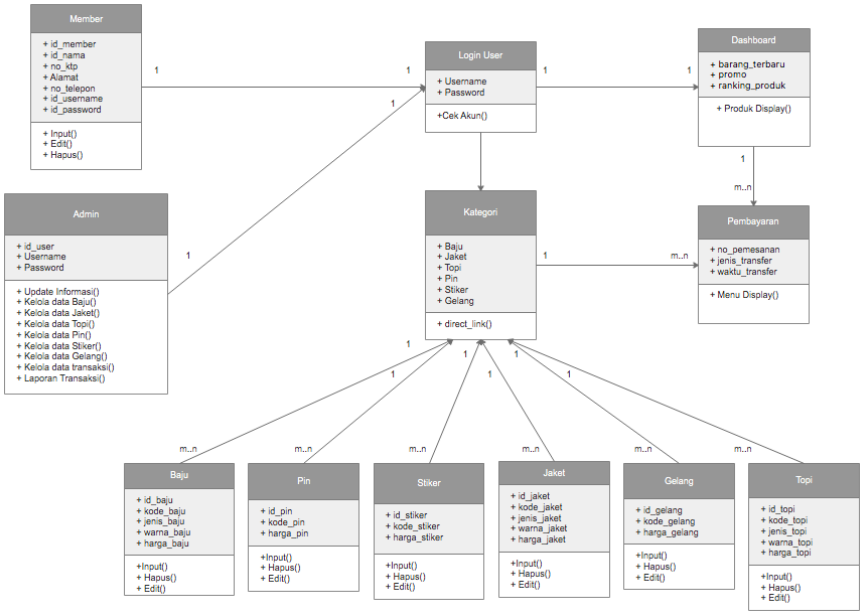

Figure 6 Class Diagram

IV. RESULT AND CALCULATION

A. Collecting Data Method

The collecting data used in this research are [21]:

1) Interview

a. Drafting of interview materials, studying cases to be asked (resource persons to organization conditions).
b. Conducting interviews with treasurers from several organizations.

2) Observation

a. Collection of financial recording data across multiple organizations.
b. Recording of things that often happen especially about obstacles.

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3) Study Literature

Search the material to obtain information that is supportive for the design by reading and summarizing from the relevant material or source of reading.

4) Internet Reference

Surfing, looking for additional information both articles, journals, until the latest technological developments that can be used as a reference in the writing and system design.

B. SWOT Analysis Result

Here is the result of the analysis for designing SueweetiesID application using SWOT method:

Figure 7 SWOT Analysis Result

Figure 7 describes strength, weakness, opportunity, and threats in formulating SueweetiesID application design, in which there are explanations of O-W, W-T, T-S, and O-S relationships described in Quadrant SWOT.

B. Login Page

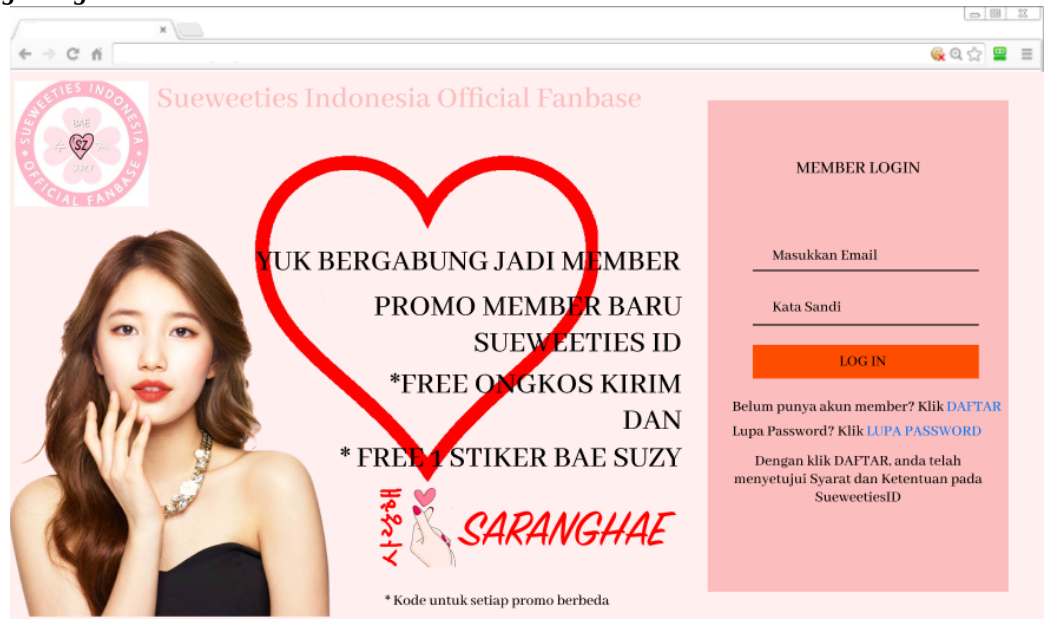

Figure 8 Login Page

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B. Dashboard

Figure 9 Dashboard

C. Product Information Detail

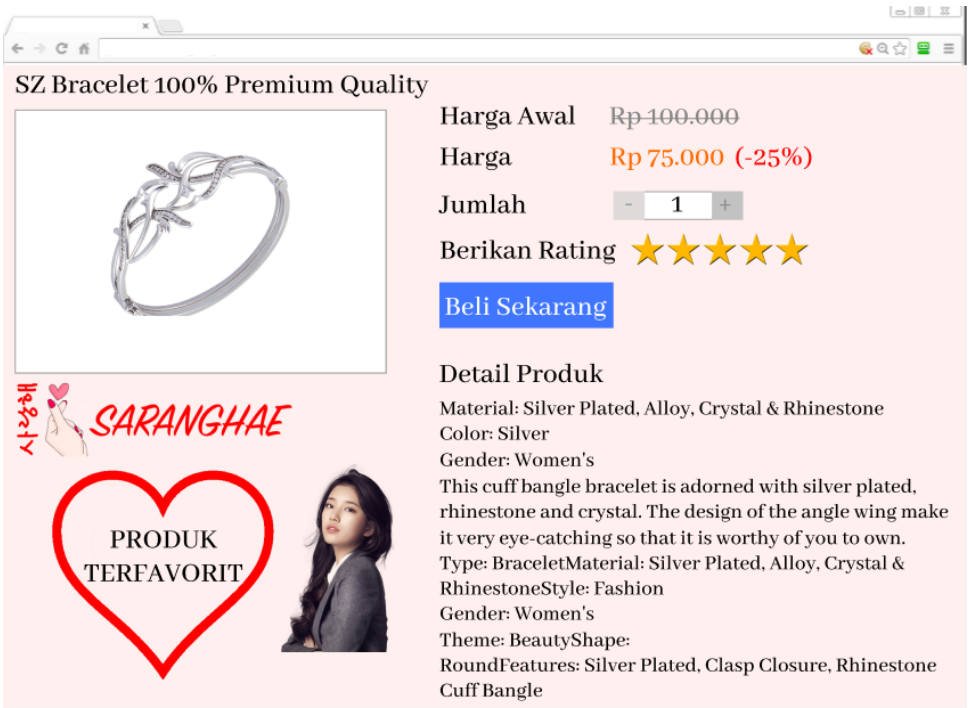

Figure 10 Product Information Detail

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D. Analytical Hierarchy Process for Rating Product

To use the AHP algorithm, we have to unravel its hierarchy, shown in Figure 11:

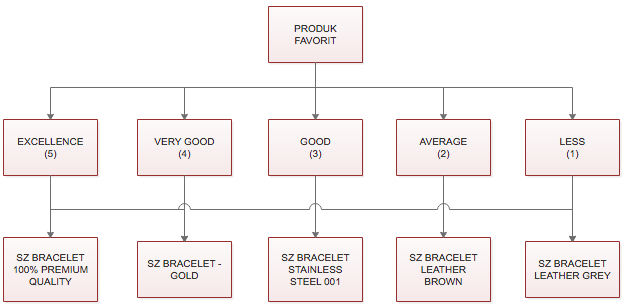

Figure 11 AHP Product Rating Hierarchy

Figure 11 explains the main purpose in this algorithm is to determine the favorite product, with 5 criteria rating ie; excellence (5 Stars), Very Good (4 Stars), Good (3 Stars), Average (2 Stars), and Less (1 Star). Of the 5 criteria, will be selected, for example to determine the favorite product of the bracelet category of 5 goods. As explained in the limitation of the problem for the criteria is only taken the highest 3 of excellence, very good, and good. Under these Criteria are not the criteria of favorite products such as Average and Less, and assuming 100-member rating.

1) Calculating Wire Pair Comparison Criteria Area

Table 1 Pair Comparison Criteria

	Excellence	Very Good	Good
Excellence	1,000	24,000	20,000
Very Good	19,000	1,000	10,000
Good	15,000	9,000	1,000
TOTAL	**35,000**	**34,000**	**33,000**

2) Calculating Wire Pair Comparison Excellence Area

Table 2 Matrix Pair Comparison Excellence Area

	SZ Bracelet 100% Premium Quality	SZ Bracelet-Gold	SZ Bracelet Stainless Steel 001	SZ Bracelet Leather Brown	SZ Bracelet Leather Grey	Priority Vector
SZ Bracelet 100% Premium Quality	1,000	5,000	4,000	4,000	5,000	**42%**
SZ Bracelet-Gold	0,000	1,000	2,000	2,000	3,000	**18%**
SZ Bracelet Stainless Steel 001	2,000	1,000	1,000	1,000	2,000	**16%**
SZ Bracelet Leather Brown	1,000	1,000	1,000	1,000	1,000	**11%**
SZ Bracelet Leather Grey	2,000	1,000	1,000	1,000	1,000	**13%**
TOTAL	**6,000**	**9,000**	**9,000**	**9,000**	**12,000**	**100%**

3) Calculating Wire Pair Comparison Very Good Area

Table 3 Matrix Pair Comparison Very Good Area

	SZ Bracelet 100% Premium Quality	SZ Bracelet-Gold	SZ Bracelet Stainless Steel 001	SZ Bracelet Leather Brown	SZ Bracelet Leather Grey	Priority Vector
SZ Bracelet 100% Premium Quality	1,000	3,000	3,000	3,000	2,000	**40%**
SZ Bracelet-Gold	1,000	1,000	1,000	1,000	1,000	**17%**
SZ Bracelet Stainless Steel 001	1,000	1,000	1,000	1,000	1,000	**17%**
SZ Bracelet Leather Brown	0,000	1,000	0,000	1,000	1,000	**10%**
SZ Bracelet Leather Grey	1,000	1,000	1,000	1,000	1,000	**17%**
TOTAL	**4,000**	**7,000**	**6,000**	**7,000**	**6,000**	**100%**

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4) Calculating Wire Pair Comparison Good Area

Table 4 Matrix Pair Comparison Good Area

	SZ Bracelet 100% Premium Quality	SZ Bracelet-Gold	SZ Bracelet Stainless Steel 001	SZ Bracelet Leather Brown	SZ Bracelet Leather Grey	Priority Vector
SZ Bracelet 100% Premium Quality	1,000	2,000	2,000	2,000	3,000	**40%**
SZ Bracelet-Gold	1,000	1,000	1,000	1,000	1,000	**20%**
SZ Bracelet Stainless Steel 001	0,000	1,000	1,000	1,000	0,000	**12%**
SZ Bracelet Leather Brown	0,000	0,000	0,000	1,000	1,000	**8%**
SZ Bracelet Leather Grey	1,000	1,000	1,000	1,000	1,000	**20%**
TOTAL	**3,000**	**5,000**	**5,000**	**6,000**	**6,000**	**100%**

5) Calculating index consistency (Criteria)

Table 5 Matrix Normalization Criteria

	Excellence	Very Good	Good	Eigen Vector Normalization
Excellence	0,029	0,706	0,606	1,341
Very Good	0,543	0,029	0,303	0,875
Good	0,429	0,265	0,030	0,724

6) Calculate index consistency (Excellence)

Table 6 Matrix Normalization Excellence

	SZ Bracelet 100% Premium Quality	SZ Bracelet-Gold	SZ Bracelet Stainless Steel 001	SZ Bracelet Leather Brown	SZ Bracelet Leather Grey	Eigen Vector Normalization
SZ Bracelet 100% Premium Quality	0,167	0,556	0,444	0,444	0,417	**0,406**
SZ Bracelet-Gold	0,000	0,111	0,222	0,222	0,250	**0,161**
SZ Bracelet Stainless Steel 001	0,333	0,111	0,111	0,111	0,167	**0,167**
SZ Bracelet Leather Brown	0,167	0,111	0,111	0,111	0,083	**0,117**
SZ Bracelet Leather Grey	0,333	0,111	0,111	0,111	0,083	**0,150**

7) Calculate index consistency (Very Good)

Table 7 Matrix Normalization Very Good

	SZ Bracelet 100% Premium Quality	SZ Bracelet-Gold	SZ Bracelet Stainless Steel 001	SZ Bracelet Leather Brown	SZ Bracelet Leather Grey	Eigen Vector Normalization
SZ Bracelet 100% Premium Quality	0,250	0,429	0,500	0,429	0,333	**0,388**
SZ Bracelet-Gold	0,250	0,143	0,143	0,143	0,167	**0,169**
SZ Bracelet Stainless Steel 001	0,250	0,143	0,143	0,143	0,167	**0,169**
SZ Bracelet Leather Brown	0,000	0,143	0,143	0,143	0,167	**0,119**
SZ Bracelet Leather Grey	0,250	0,143	0,143	0,143	0,167	**0,169**

8) Calculate index consistency (Good)

Table 8 Matrix Normalization Good

	SZ Bracelet 100% Premium Quality	SZ Bracelet-Gold	SZ Bracelet Stainless Steel 001	SZ Bracelet Leather Brown	SZ Bracelet Leather Grey	Eigen Vector Normalization
SZ Bracelet 100% Premium Quality	0,333	0,400	0,400	0,333	0,500	**0,393**
SZ Bracelet-Gold	0,333	0,200	0,167	0,167	0,167	**0,207**
SZ Bracelet Stainless Steel 001	0,000	0,200	0,167	0,167	0,000	**0,107**
SZ Bracelet Leather Brown	0,000	0,000	0,167	0,167	0,167	**0,100**
SZ Bracelet Leather Grey	0,333	0,200	0,167	0,167	0,167	**0,207**

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9) Calculating Maximum Eigen Vector (Criteria)

Λmaks = (35,000 x 1,341)+(34,000 x 0,875)+(33,000 x 0,724)
= 100,556328

10) Calculating Maximum Eigen Vector (Excellence)

Λmaks =(6,000 x 0,406)+(9,000 x 0,161)+(9,000 x 0,167)+(9,000 x 0,117)+(12,000 x 0150)
= 8,233

11) Calculating Maximum Eigen Vector (Very Good)

Λmaks =(4,000 x 0,388)+(7,000 x 0,169)+(6,000 x 0,169)+(7,000 x 0,119)+(6,000 x 0,169)
= 5,598

12) Calculating Maximum Eigen Vector (Good)

Λmaks =(3,000 x 0,393)+(5,000 x 0,207)+(5,000 x 0,107)+(6,000 x 0,100)+(6,000 x 0,207)
=4,587

13) Calculate Index Consistency (Criteria)

CI = (100,556328-3) / (3-1)
= 48,77816399

14) Calculate Index Consistency (Excellence)

CI = (8,233-5) / (5-1)
= 0,80825

15) Calculate Index Consistency (Very Good)

CI = (5,598-5) / (5-1)
= 0,1495

16) Calculate Index Consistency (Good)

CI = (4,587-5) / (5-1)
= -0,10325

17) Calculate index ratio (Criteria)

CR = 48,77816399 / 0,58
= 84,10028275

18) Calculate index ratio (Excellence)

CR = 0,80825 / 0,58
= 1,393534483

19) Calculate index ratio (Very Good)

CR = 0,1495 / 0,58
= 0,257758621

20) Calculate index ratio (Good)

CR = -0,10325 / 0,58
= -0,178017241

21) Calculating Overall Composite

Table 9 Overall Composite

Overall Composite Weight	Weight	SZ Bracelet 100% Premium Quality	SZ Bracelet-Gold	SZ Bracelet Stainless Steel 001	SZ Bracelet Leather Brown	SZ Bracelet Leather Grey
Excellence	1,341	0,406	0,161	0,167	0,117	0,150
Very Good	0,875	0,388	0,169	0,169	0,119	0,169
Good	0,724	0,393	0,207	0,107	0,100	0,207
Composite Weight		**1,168478**	**0,513644**	**0,44929**	**0,333422**	**0,498893**

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Table 9 show composite weight obtained from the column weight multiplied by the employee on each criterion. So the result of the overall composite shows SZ Bracelet 100% Premium Quality with a value of 1.168478, showing the calculation results of the algorithm using AHP for the favorite product ranking, by taking the example for the Bracelet product category.

V. CONCLUSION

From the results of this research conclusions that can be taken are as follows:
1) SueweetiesID application design is done by defining the existing business process first, and then made UML Diagram like; Use case diagrams, Activity Diagrams, Sequence Diagrams, and Class Diagrams and then mock up the design of the application for the proposal in the development of the system
2) The results of analysis obtained from SWOT analysis get the relationship in O-W, W-T, T-S, and O-S. SWOT analysis results illustrate:
a) Opportunity - Weakness: The design of the system will facilitate the ordering, but if the order exceeds the quota amount will reduce the service speed and Role on the system design can be managed more than 1 administrator, but there is no specific role to set the product.
b) Weakness - Threat: Ordering and promotion only through social media so that new and old members are not well monitored and Merchandise is too much so it cannot manageable
c) Threat - Strength: Already have a fixed member so that operations can be done and Do not Have a special business entity, so the application development can only be done module addition and not integrated in other institutions
d) Opportunity Strength: Speed of service can be done quickly, due to business process is very simple and system design is done due to the number of reservations by members.

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