

MANAGEMENT INFORMATION SYSTEM IMPLEMENTATION DOYAN DRINKS USING K-MEANS

M Ridho Ramadhan¹, Yusuf Ramadhan Nasution², Aninda Muliani Harahap³

Sistem Informasi, Sains Dan Teknologi, Universitas Islam Negeri Sumatera Utara^{1,2}, Ilmu Komputer, Sains Dan Teknologi, Universitas Islam Negeri Sumatera Utara³
mridhoramadhan37@gmail.com

Received : 08 November 2022, Revised: 08 December 2022, Accepted : 08 December 2022

**Corresponding Author*

ABSTRACT

Technological developments are currently very influential in business collaboration, to be precise in Doyan's drink, Doyan is a local beverage brand that has difficulty determining franchise partnerships to determine the type of package in the strategy of location, area, and facilities of prospective franchisees, by implementing a Management Information System on Doyan can determine the type of franchise based on the required criteria, this study uses the Waterfal method in designing management information systems and uses the K-Means algorithm in determining the type of franchise that suits the needs of the candidate. K-Means functions to cluster the franchise type criteria data that will produce the closest value so that the output can choose and determine the more appropriate type of franchise package, and the store can manage product sales, stock, and attendance at all franchise branches.

Kata kunci : *K-Means, Franchise, Management Information System*

1. Introduction

Technological development is a process to increase the added value of its utilization which provides so many benefits in various aspects of economic progress (Ismail & Sri, 2019). Doyan is a local beverage brand that is growing in the city of Medan which provides a wide variety of the latest beverage variants, Doyan has the goal of building a business partnership or franchise, by attracting potential franchisees using promotional methods, but hooked has difficulty providing solutions to prospective franchisees to determine the right type of cooperation package according to the needs of future business candidates and monitor sales performance and product stock in each store branch.

In this study the authors refer to the process of making a web-based management information system precisely and accurately. To realize this, writing uses the K-Means Clustering algorithm, where this algorithm functions to select data into each predetermined class. (Mochamad, Masitha, Risna, & Soikhum, 2020). Its function is so that the data that has been classified can be used to determine the level or level of the franchise to be purchased by the prospective new business according to the wishes of the prospective business based on location, area, cost, and others. (Davis, 1992; Pustaka et al., 2007). That way the opportunity and trust to buy a franchise hooked in accordance with the wishes of potential partners in a younger level and exactly according to the criteria the prospective franchise wants (Ningrum et al., 2020). The author conducted research by combining management information systems using the K-Means algorithm in determining the level of the type of partnership at any level and using the waterfall method in designing web-based systems (Efriani et al., 2021; Haviluddin et al., 2021; Wulandari et al., 2022). The results of this study can make it easier for shops and prospective franchisees to determine the level of cooperation with hookers and make it easier for hooked parties to manage sales, stock, and attendance of each branch that cooperates with the hooked company.

2. Literature Review

In the previous (Subehan, 2020) research entitled "franchise information system design based on Android, PHP (codeigniter) and MySQL" in this study it was explained that research builds a website-based system to make it easier for companies to build business partnerships easily by using websites and controlling shops in carry out sales transactions, as well as find out the stock of goods that will be prepared onwards as needed by the respective stores.

In research (Muhammad, 2016) regarding "Application of K-Means Clusters in Web-based Student Attendance Management Information Systems doi Madrasah Aliyah Negeri Lumajang" in this study discussed recording data of students who were absent and present in one of the book learning media, problems What often arises is making fake letters without being noticed, the data is inaccurate and the teacher has difficulty checking student attendance data, so this study created a website-based attendance system that can provide student information to parents using the SMS method, with once the data becomes accurate using the waterfall method, where the K-Means cluster method where data is entered into group 1 as entry hours, cluster 2 as study hours (Sylfania et al., 2021), cluster 3 as school hours, software engineering experts with 100% functional validation and 100 usability % of school principals, homeroom teachers, and teacher usability 93.13% and student users a 84%. In research (Ai, Falentino, & Adhitia, 2021) with the title "Implementation of the k_means Clustering Analysis algorithm to determine barriers to online learning at Yspim Gegerbitung Vocational School", this research explains that Yspim Vocational Schools experience problems in online learning, this has an impact on learning activities both to parents and teachers who have limitations in providing good learning facilities, this makes researchers take actions that are divided into 2 clusters, namely low clusters and high clusters to analyze the level of learning barriers by using the k-means clustering analysis algorithm (Rohmah et al., 2021).

Based on the results obtained in this study that the implementation of the k-means clustering analysis algorithm gets results.

- a. By using this algorithm method, the result is that there are 9 classes that fall into the category with classes that experience low-level learning barriers while at a high level there are 10 TKJ 1 classes, 10 TKJ2, 10 TKJ3, 10 RPL, 10 RBSM 1, 10 TBSM 2, 11 RPL, 12 RPL 1, and 12 TJK 2, and 6 classes in the high class category (Worung et al., 2020)
- b. The power used in the study was taken from dapodik data and report cards that had carried out the filtering and sorting stages of data by class.

From the above results it is concluded that the k-means clustering analysis determines online learning barriers has been successful using the application on Persone which shows good results with an accuracy of 94%.

In the study (Haviluddin, Junita, & Mahendra, 2021) entitled "Implementation of the K-Means Method for Grouping Final Project Recommendations" in this study the authors explained that in a tertiary institution there are many students who experience difficulties in determining research areas taken outside of their own abilities, The aim of this research is to recommend an appropriate research area based on data on A, B, C, D grades in 10 compulsory courses which can be taken in semester 6 for the 2017 to 2018 batch in the informatics study program, faculty of engineering, Mulawarma University, in this study using the k-means method by using experimental data by grouping the research area with 3 C clusters, namely C1 is a little, has 1 MKW members, C2 is currently has 6 MKW members, and C3 is a lot with 3 MKW members that have been obtained from clustering accuracy testing using the Sum of Squared Errors (SSE) method sebesar 0.6566 and the Silhouette Coefficient (SC) method of 5.8329 have been obtained, this shows that the MKW value also has an influence in determining TA in determining the selection of research locations.

3. Research Methods

The method used in this study uses the R&D (Research and Development) research method, this method is used to assist in designing systematic data collection in Doyan, such as employee datasets, sales data, and franchise data (Risa & Wahyu, 2020), but in research This writer uses an additional method in system design and development using the SDLC (Software Development Life Cycle) method, this SDLC method can describe more clearly about the stages of system design, design, coding, testing and maintenance on the system to be implemented (J & Simeon, 2017). This study uses data collection techniques related to the methods used to produce

accurate, relevant, valid data. website-based to monitor the performance of each store branch and determine the level of future business candidates (Suardi Mandai et al., 2021). Here is the method used:

- a. Interview
Interview is an activity by conducting question and answer directly to the parties involved. This method is to ensure that the data obtained is in accordance with the facts and obtain data on objects related to research.
- b. Observation
The observation method is used to study and know directly the object under study. This data collection is done by directly observing the sales information system.
- c. Library Literature
Library literature is a method of collecting data by reading and comparing literature, from books, pamphlets and previous research as well as from websites, as well as studying and analyzing literature related to web-based sales information systems (Pertiwi et al., 2021; Purwayoga, 2020).

The design method that the authors use in this study is the "Software Development Life Cycle (SDLC) Waterfall" method (Mulyani, 2016). This model takes a systematic and sequential approach starting from the level of system requirements and then moving on to the requirements, design, coding, testing/verification, and maintenance stages. In Figure 1 are the steps that must be carried out using the SLDC Waterfall (Bastian et al., 2020).

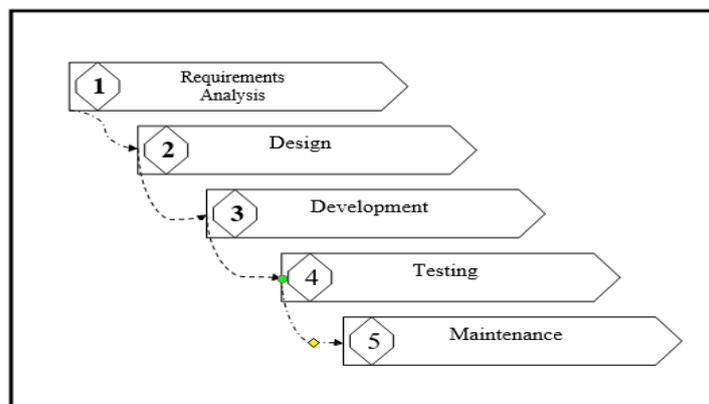


Fig 1. SDLC Waterfalls

The Requirement Analysis Stage is the planning stage concerning the study of user needs, both technical and technological feasibility. The waterfall model (SDLC) stage is carried out by planning the system to be built. In this case the Momochesstea website focuses more on franchise sales, then sales of beverage products, and finally processing stock of goods, while Analysis is an in-depth process of all problems and risks to users. Design is a stage concerning system design which will provide a solution plan for the problems that arise at the analysis stage. Development is the software development process that begins (Dhewayani et al., 2022; Marlina et al., 2018). The SDLC stage can be said to be the longest phase of the application development process. Because this process includes the process of making the UI and GUI of the application. Testing is the testing phase, the stage for testing the system is already running according to a pre-agreed plan, including testing each menu whether there are still errors or not. Maintenance is the stage where maintenance and maintenance of the web is carried out (Sulistiyawati & Supriyanto, 2021).

K-Means is a cluster analysis algorithm or non-hierarchical grouping. In its application, k-means groups data based on the distance between the data and the cluster centroid points obtained through an iterative process. The following are the calculation steps to apply optimization using the K-Means algorithm. Determine the number of clusters (k) in the dataset (Cahyo & Sulpadianti, Pembuatan Aplikasi Clustering Gangguan Jaringan Menggunakan Metode

K-Means Clustering, 2020). In carrying out K-Means calculations, it can be done using the formula below by using the formula below:

$$De = \sqrt{(X_i - y_i)^2 + \dots + (X_i - Y_i)^2} \dots\dots\dots(1)$$

Information:

- De = Euclidean Distance
- (x) = object coordinates
- (y) = centroid coordinates
- i = the number of objects

The next step is to calculate the cluster points again with the current cluster members. Cluster point is the average value of all data in a cluster (Ema Ainun Novia, Woro Isti Rahayu, 2020). Can be calculated using the following formula:

$$C_{kj} = \frac{\sum_{i=1}^P x_{ij}}{P} \dots\dots\dots(2)$$

The final step is to calculate each object again with a Cluster point (new Centroid). If the group calculation does not change anymore, then the clustering calculation is declared complete. However, if the group calculations still change, then the calculations are carried out again as in step c until the cluster members no longer move. In this study, the K-Means algorithm is only applied to the franchise selling feature (Supardi & Kanedi, 2020). The goal is to make it easier for prospective partnerships and investors to make franchise purchase transactions. Please note that the franchise in Momochesetea is divided into 3 levels, namely Gold, Silver and Bronze (Pertiwi et al., 2021). These three levels have their advantages and disadvantages. In the process of implementation, the author will divide the aspects that must be fulfilled by potential partnerships or investors in purchasing a franchise, namely by using the aspect table in determining the level of the franchise level as follows:

Table 1 - Table of Aspects of Determining Franchise Levels

Surface area	Capital	Location	Mains Voltage
4-6 meters	20 million	Local road	≥1300 VA
7-9 meters	50 million	Local road	≥2200 VA
10-12 meters	100 million	Malls / Supermarkets	≥3500 VA

Meanwhile, the determination of the franchise level is determined based on aspects that meet, and in accordance with the policies of momochesetea. Where later every potential partnership, or investor who wants to buy a franchise must have the aspects listed in Table 1 above. And for the division of levels can be seen in Table 2 below.

Table 2 - Franchise Level/Tier Table

Level	Requirements / Aspects that must be owned	Facilities that can be obtained
-------	---	---------------------------------

Gold	Land area: 10 x 12 meters 2. Capital : 100 million. Location: Mall or Supermarket. Mains Voltage : ≥ 3500 VA. Staff Capacity: ≥ 10 people.	Doyan License Priority supply of raw materials Product manufacturing equipment Uniform Promotion media Training and SOP book Standard booth design Refrigerator Freezer
Silver	Land area: 7-9 meters 2. Capital : 50 million. Location: Arterial road. Mains Voltage : ≥ 2200 VA Employee Capacity : ≥ 6 people.	Doyan License. Priority supply of raw materials. Product manufacturing equipment. Uniform. Promotion media. Training and SOP book. Standard booth design. Hot Menu Tools. Refrigerator.
Bronze	Land area: 4-6 meters2 Capital : 20 million Location : Local street Mains Voltage : ≥ 1300 VA Employee Capacity : ≥ 3 people	Dan License Priority supply of raw materials Product manufacturing equipment Uniform Training and SOP book Standard booth design

At this stage it describes the activities carried out in this study by starting requirements, design, implementation with coding, and testing the applied applications, the research taken in this stage is closely related to the SDLC waterfall development technique in Figure 1, so the author uses the stages research in Figure 2 as follows:

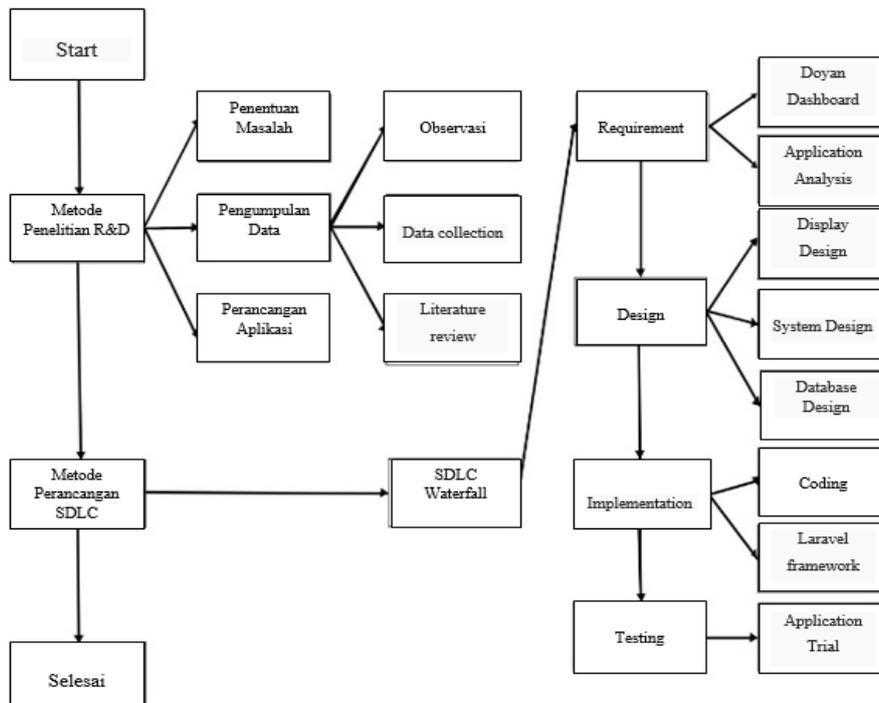


Fig 2. Flow of Research Stages

In Figure 2 above, the first stage is carried out by carrying out observations, interviews, literature studies using the R&D research method where this research will produce a new application or application that is developed based on the data obtained, with the second stage,

namely using the SDLC Waterfall design method by designing the application to be built, then carrying out the design stages of the application being built by carrying out the implementation stages of the system using the coding process, so that at the last stage the application built is tested first or application trial so that the management information system that is built is in accordance with the objectives of the research carried out (Wahyujati, 2021).

4. Results and Discussions

In building a management information system using the SDLC Waterfall "Software Development Life Cycle" method which begins with problem determination and needs analysis, after analyzing the desired needs then the design stage is carried out, at this stage the author uses a system use case diagram, class diagram which can be describes the behavior of the system to be built and uses an Entity Relationship Diagram (ERD) which is used to model data or systems in the database so that it is structured and relates between data effectively relatively complex, this is important in designing new management information system applications in this research (Nur Aini Setyawati, 2021). The following is a Usecase overview of the management information system application that will be built, to be precise in Figure 3 the usecase stages used in this design.

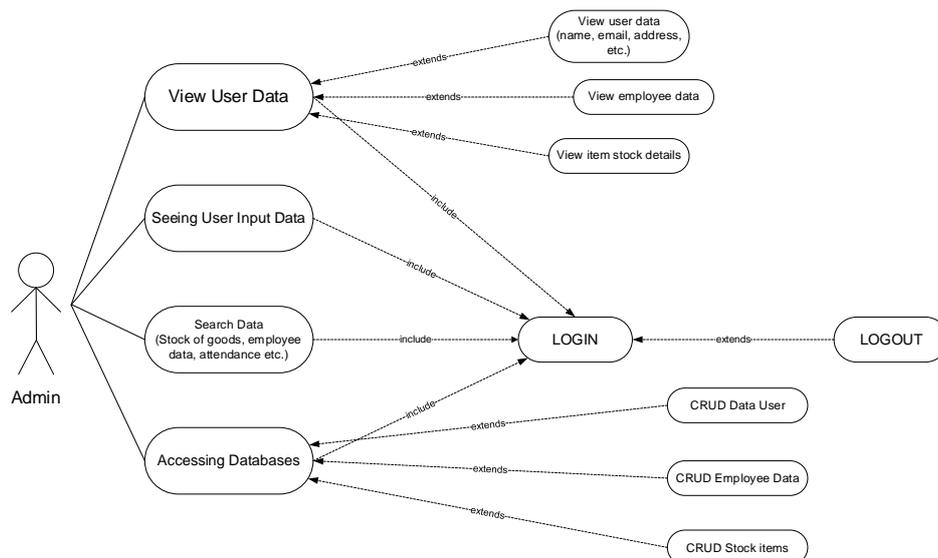


Fig 3. Usecase Diagram User

In the use case diagram above it can be seen that the role is filled by the user, where the user has the ability to access the website dashboard, and CRUD data. CRUD data that can be done by the user is to input employee data, make employee absence reports, request goods to the center, and make daily reports (Anggoro et al., 2021).

Class diagrams are a type of diagram in the form of a structure in the UML model. This diagram describes the structure, attributes, classes, relationships and methods very clearly for each object. Class diagrams provide data in the form of what relationships occur between classes, not explain what happened. Class diagrams in a project generally use a concept called object-oriented, thus making it easy to use (Rachmat, Husain, Nurdiana, & Prahara Siswnato, 2021).

Sequence diagrams are ways or scenarios for visualizing and validating various technical scenarios on a runtime basis. Through this sequence diagram, users are expected to be able to predict how a system will behave and find solutions for updated models (Cahyo & Sembiring, Rancang Bangun Sistem PErgudang Semua Menyeduh Secangkir Kopi, 2021).

In this study, the authors then performed calculations to determine the level of the franchise level using the K-Means method, which had previously been divided into franchise levels in Table 2 above. To test the K-Means algorithm, several datasets are needed, which will be calculated and put into different clusters (Tjahyadi, 2018). In this study, the authors used 20 data from previously registered partnerships or investors. The goal is to find the iteration value of

each cluster, which will later become a reference for processing new partnership or investor data. The following is the Doyan partnership franchise dataset, which can be seen in Table 3.

Table 3 - Table Name of Partnership/Investor Franchise

Name	Meters	Capital	Location	Electricity	Employee
Abmad Budianto	4-6	20 Million	Local road	71300 VA	> 6 person
Rud Salm	7-9	450 Million	Arterial road	> 2200 VA.	> 3 person
Nugroho	4-6	450 Million	Local road	> 2200 VA.	> 3 person
Syapuri nopi	7-9	450 Million	Mall or Supermarket	> 2200 VA.	> 10 person
Desy Khorester	4-6	450 Million	Local road	>1300 VA	> 3 person
Alexander	4-6	20 Million	Arterial road	71300 VA	> 3 person
Gula tom	10-12	100 Million	Mall or Supermarket	->3500 VA	> 10 person
Dina Saegar	7-9	20 Million	Local road	>1300 VA	> 3 person
Femando Gokias	4-6	450 Million	Local road	71300 VA	> 3 person
Alex	4-6	100 Million	Arterial road	> 2200 VA.	> 6 person
Mohammad Badri	10-12	100 Million	Local road	->3500 VA	> 10 person
Muriski	10-12	50 Million	Arterial road	>1300 VA	> 3 person
Beni Smambela	4-6	20 Million	Local road	>1300 VA	> 3 person
Ahmad Geraldo	4-6	100 Million	Arterial road	->3500 VA	> 10 person
Tota Nogaha	10-12	450 Million	Mall or Supermarket	->3500 VA	> 6 person
Badi Setiawan	4-6	20 Million	Arterial road	>1300 VA	> 3 person
Pratama	10-12	100 Million	Mall or Supermarket	> 2200 VA.	> 6 person
Samanka Firuansca	7-9	450 Million	Arterial road	> 2200 VA.	> 6 person

To make it easier to perform calculations, the authors change the values of the attributes/aspects in the table above. And can be seen in Table 4 below.

Table 4 - Partnership Franchise Name Table After being changed

Name	Area / Meters	Capital	Location	Electricity	Employee
Abmad Budianto	80	80	80	80	90
Rud Salm	90	90	90	90	80
Nugroho	80	90	80	90	90
Syapuri nopi	90	90	100	90	100
Desy Khorester	80	90	80	80	80
Alexander	80	80	90	80	80
Gula tom	100	100	100	100	100
Dina Saegar	90	80	80	80	80
Femando Gokias	80	90	80	80	80
Alex	80	100	90	90	90
Mohammad Badri	100	100	80	100	100
Muriski	100	90	90	80	80

Beni Smambela	80	80	80	80	80
Ahmad Geraldo	80	100	90	100	100
Tota Nogaha	100	90	100	100	90
Badi Setiawan	80	80	90	80	80
Pratama	100	100	100	90	90
Samanka Firuansca	90	90	90	90	90

Furthermore, carrying out the K-Means calculation process will go through several stages, the following is the sequence of calculations with the K-Means algorithm :

A. 1st iteration

The first step that must be done is to determine the 1st iteration of the existing dataset. The trick is to take the highest value from each cluster in Table 4, so as to get the Ceteroid value in Table 5 as follows.

Table 5 - Centroid Starting Point

C1	100	100	100	100	100	500
C2	80	90	80	90	90	430
C3	80	80	80	80	80	400

Where C1 represents the gold level/grade, C2 for Silver, and C3 for Bronze. Calculating Centroid Distances At this stage, we will calculate the distances for each centeroid data using Formula 1 using the dataset in Table 4 (Munir & Alfujianur, 2020) The following is the calculation.

$$C_{1,1} = \sqrt{(100 - 80)^2 + (100 - 80)^2 + (100 - 80)^2 + (100 - 80)^2 + (100 - 90)^2} = \mathbf{40.124}$$

$$C_{1,2} = \sqrt{(100 - 90)^2 + (100 - 90)^2 + (100 - 90)^2 + (100 - 90)^2 + (100 - 80)^2} = \mathbf{20.493}$$

$$C_{1,3} = \sqrt{(100 - 80)^2 + (100 - 90)^2 + (100 - 80)^2 + (100 - 90)^2 + (100 - 90)^2} = \mathbf{31.780}$$

$$C_{1,4} = \sqrt{(100 - 90)^2 + (100 - 90)^2 + (100 - 100)^2 + (100 - 90)^2 + (100 - 100)^2} = \mathbf{17.32}$$

$$C_{1,5} = \sqrt{(100 - 80)^2 + (100 - 90)^2 + (100 - 80)^2 + (100 - 80)^2 + (100 - 90)^2} = \mathbf{36.331}$$

* dan seterusnya hingga C1,20

$$C_{2,1} = \sqrt{(80 - 80)^2 + (90 - 80)^2 + (80 - 80)^2 + (90 - 80)^2 + (90 - 90)^2} = \mathbf{14.142}$$

$$C_{2,2} = \sqrt{(80 - 90)^2 + (90 - 90)^2 + (80 - 90)^2 + (90 - 90)^2 + (90 - 80)^2} = \mathbf{14.491}$$

$$C_{2,3} = \sqrt{(80 - 80)^2 + (90 - 90)^2 + (80 - 80)^2 + (90 - 90)^2 + (90 - 90)^2} = \mathbf{0}$$

$$C_{2,4} = \sqrt{(80 - 90)^2 + (90 - 90)^2 + (80 - 100)^2 + (90 - 90)^2 + (90 - 100)^2} = \mathbf{22.135}$$

$$C_{2,5} = \sqrt{(80 - 80)^2 + (90 - 90)^2 + (80 - 80)^2 + (90 - 80)^2 + (90 - 90)^2} = \mathbf{10.488}$$

* dan seterusnya hingga C2,20

$$C_{3,1} = \sqrt{(80 - 80)^2} + (80 - 80)^2 + (80 - 80)^2 + (80 - 80)^2 + (80 - 90)^2 = \mathbf{10}$$

$$C_{3,2} = \sqrt{(80 - 90)^2} + (80 - 90)^2 + (80 - 90)^2 + (80 - 90)^2 + (80 - 80)^2 = \mathbf{20}$$

$$C_{3,3} = \sqrt{(80 - 80)^2} + (80 - 90)^2 + (80 - 80)^2 + (80 - 90)^2 + (80 - 90)^2 = \mathbf{0}$$

$$C_{3,4} = \sqrt{(80 - 90)^2} + (80 - 90)^2 + (80 - 100)^2 + (80 - 90)^2 + (80 - 100)^2 = \mathbf{13.784}$$

$$C_{3,5} = \sqrt{(80 - 80)^2} + (80 - 90)^2 + (80 - 80)^2 + (80 - 80)^2 + (80 - 90)^2 = \mathbf{26.076}$$

* and so on up to C3,20

Furthermore, performing calculations in inter-cluster grouping of each calculation for each data with the initial centroid can be seen in Table 5.

Table 6 - Clustering Results With Initial Centroid Points

C1	C2	C3
40.1248053	14.1421356	10
20.49390153	14.4913767	20
31.78049716	0	13.7840488
17.32050808	22.1359436	26.0768096
36.33180425	10.4880885	10
36.33180425	17.6068169	10
0	31.4642654	39.7492138
36.33180425	17.6068169	10
36.33180425	10.4880885	10
24.69817807	14.1421356	24.2899156
20	24.2899156	34.3511281
24.8997992	24.6981781	24.4948974
40.24922359	14.4913767	0
22.36067977	17.0293864	29.6647939
10.48808848	30	35.91657
36.33180425	17.6068169	10
10.48808848	30	35.91657
20.24845673	14.1421356	19.7484177

After grouping between clusters from each calculation for each data with the initial centroid. The results obtained were 4 people C1 (Gold), 8 people C2 (Silver), and 8 people C3 (Bronze). The next step is to determine the 2nd iteration of the classification results that have been done before. The point is to ensure the position of each data relative to the centroid is correct or not, by using formula 2 above (Anjar Wanto, Muhammad Noor Hasan Siregar, 2020).

$$C_{1, Large} = \frac{100 + 100 + 100 + 100}{4} = \mathbf{100}$$

$$C_{1, Capital} = \frac{100 + 100 + 90 + 100}{4} = \mathbf{97.5}$$

$$C_{1,Location} = \frac{100 + 80 + 100 + 100}{4} = 95$$

$$C_{1,Current} = \frac{100 + 100 + 100 + 90}{4} = 97.5$$

$$C_{1,Employee} = \frac{100 + 100 + 90 + 90}{4} = 95$$

$$C_{2,Large} = \frac{90 + 80 + 90 + 80 + 100 + 80 + 90 + 100}{8} = 88.75$$

$$C_{2,Capital} = \frac{90 + 90 + 90 + 100 + 90 + 100 + 90 + 100}{8} = 93.75$$

$$C_{2,Location} = \frac{90 + 80 + 100 + 90 + 90 + 90 + 90 + 80}{8} = 88.75$$

$$C_{2,Current} = \frac{90 + 90 + 90 + 90 + 80 + 100 + 90 + 90}{8} = 90$$

$$C_{2,Employee} = \frac{80 + 90 + 100 + 90 + 80 + 100 + 90 + 90}{8} = 90$$

$$C_{3,Large} = \frac{80 + 80 + 80 + 80 + 80 + 80 + 90 + 80}{8} = 81.25$$

$$C_{3,Capital} = \frac{80 + 90 + 80 + 80 + 80 + 80 + 80 + 80}{8} = 82.5$$

$$C_{3,Location} = \frac{80 + 80 + 80 + 90 + 80 + 80 + 90 + 80}{8} = 82.5$$

$$C_{3,Current} = \frac{80 + 80 + 80 + 80 + 80 + 80 + 80 + 80}{8} = 80$$

$$C_{3,Employee} = \frac{90 + 80 + 80 + 80 + 80 + 80 + 90 + 80}{8} = 81.25$$

From the calculation above, the centroid values for the 2nd iteration are as follows:

Table 7 - Centeroid Starting Point

C1	100	97.5	95	97.5	95	485
C2	88.75	93.75	88.75	90	90	451.25
C3	81.25	82.5	82.5	80	81.25	407.5

Then do the same calculation as step 2 using the centroid from the 2nd iteration. After grouping between clusters from each calculation for each data with the centeroid from the 2nd iteration. The results obtained were 4 people C1 (Gold), 8 people C2 (Silver), and 8 people C3 (Bronze). It can be seen that the grouping results from the two iterations are the same, so it can be concluded that the clustering was successful.

B. Implementation

In this phase, the software development process begins. The SDLC stage can be said to be the longest phase of the application development process. Because this process includes the process of making the UI and GUI of the application (Daniel Christian Natan, Martinus Edy Sianto*, 2021). The following is the result of the implementation of the Doyan management information system application in Figure 3.

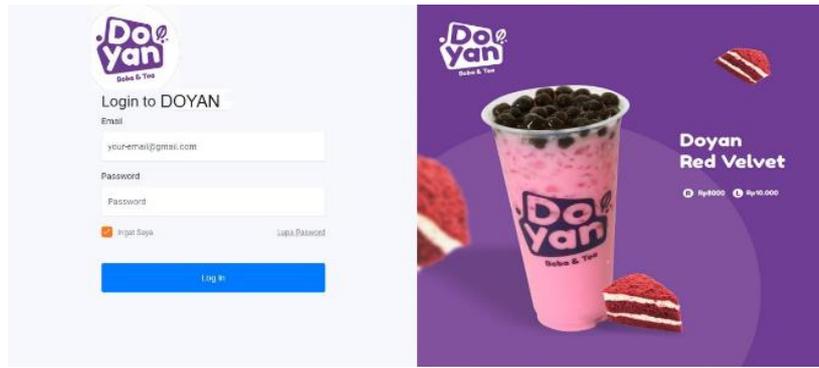


Fig 3. Login Page

Above this is how the Login page looks. This page is the first page that must be accessed by the admin in order to access the main menu or dashboard in Figure 6 below. This page will provide admin access to manage sales data, prospective business data, attendance data and inventory data.

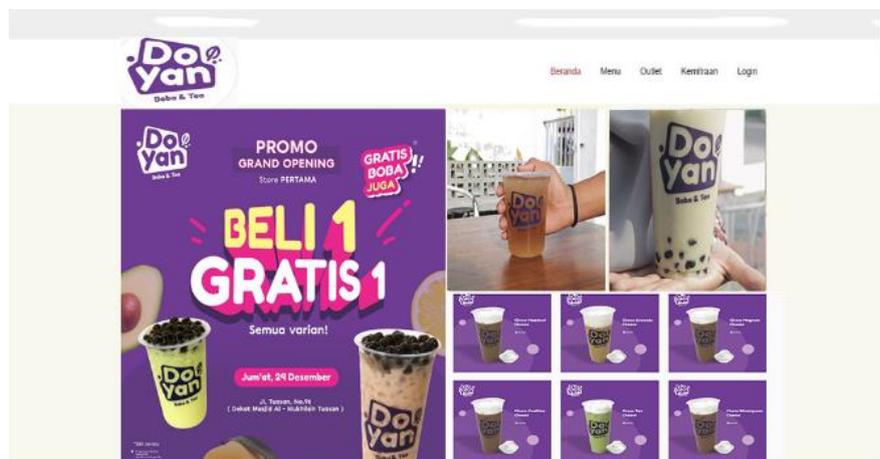


Fig 4. Front page

In Figure 4 above is the result of the implementation of the front page, it can be seen on this page that the researcher has included various features that can be seen by the user, this front page contains a promotional menu display, a product menu to be sold, a menu to join as a business collaboration partner.

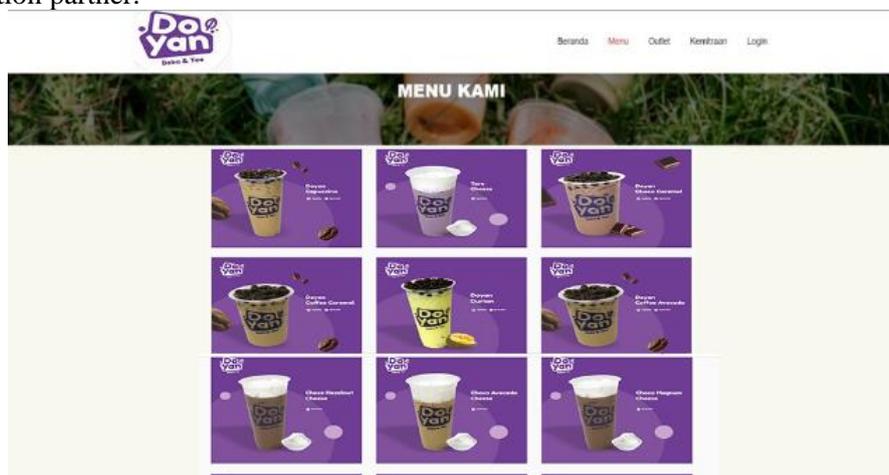


Fig 5. Menu Page

On this menu page the user can see what products Doyan sells. That way users can more easily get an idea of what products they sell when they have purchased a partnership or franchise, as can be seen in Figure 5 above. The following is the result of implementing the admin dashboard. This dashboard is the main page for the admin to be able to access various applications. On this page the researcher has also placed various menus to make it easier for admins to access existing features, as can be seen in Figure 6 below.

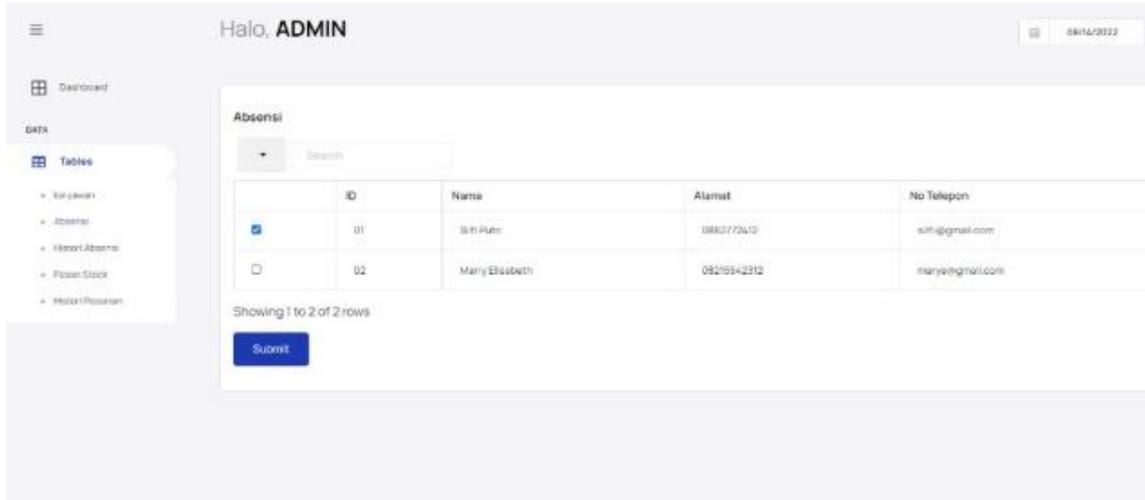


Fig 6. Admin dashboard page

On this page the admin can manage and use existing features to input products, view attendance data, inventory data, and view data on prospective franchisees who will join. You could say that on this page the admin can control all incoming requests from each existing outlet (Susilo et al., 2021).

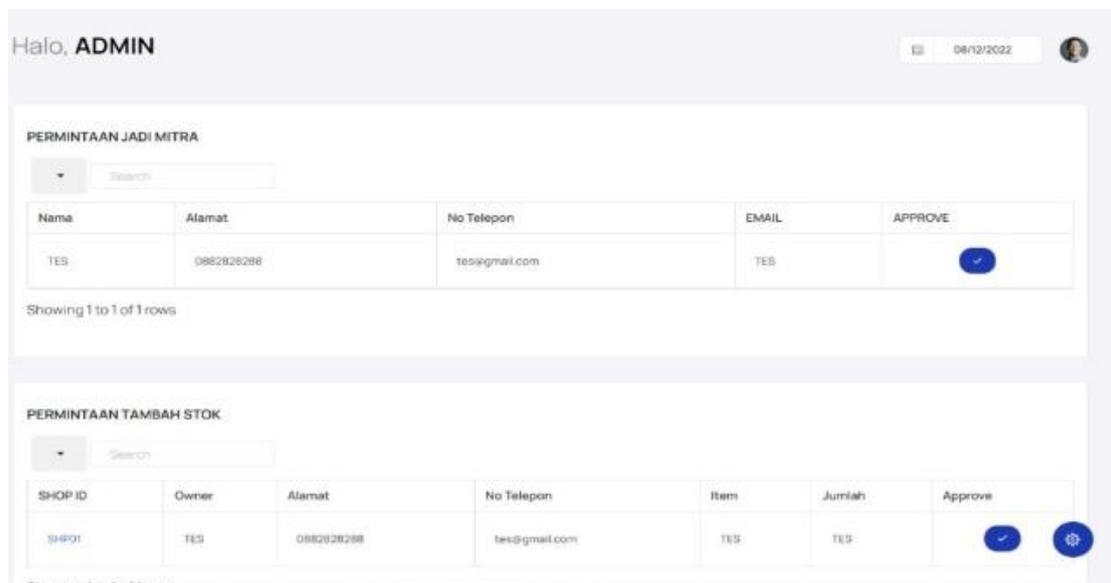


Fig 7. Data Processing Page (Admin)

In Figure 7 it can be seen that the page is a display of prospective business partners who will join, if there are prospective business partners who will register to cooperate the admin will check the data whether it is appropriate or not, if the data entered is appropriate then the admin will approve the data, so that potential partners businesses can trade according to the levels that

have been carried out using the k-means algorithm, and can manage inventory demand data at each branch.

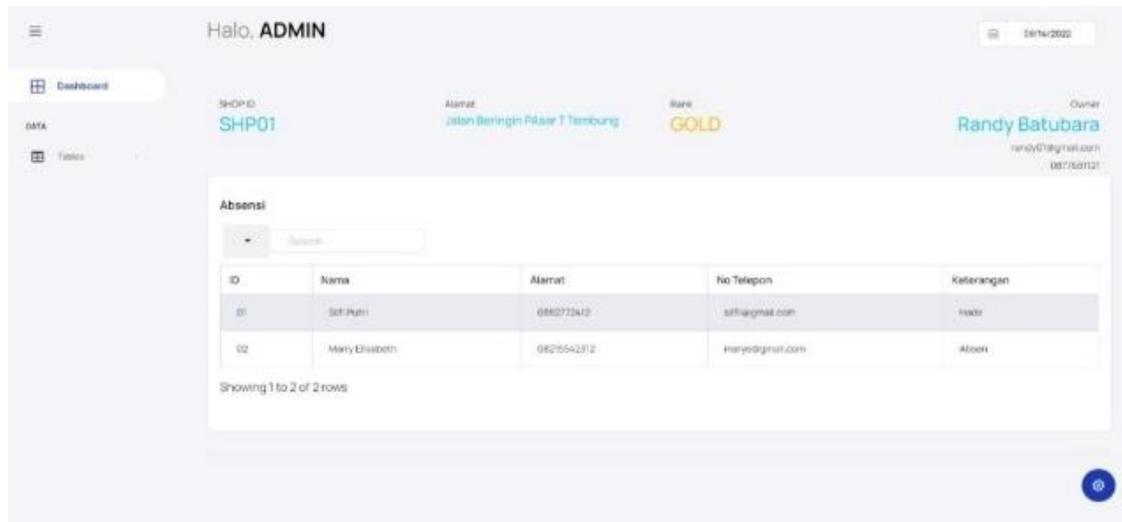


Fig 8. Employee Attendance Processing Page (Admin)

In Figure 8 above is one of the results of the management information system that has been implemented with the result that every new customer who will join Doyan will be automatically calculated using the K-Means method to determine which level is more appropriate based on the tested dataset criteria, and the data that has been inputted by the prospective business partner, can be seen in the picture above the partner has been approved by the admin and got a match level at the Gold level on Arterial Roads.

5. Conclusion

From the results of designing a Web-based Hooked Management Information System, it can be concluded that a Web-Based Beverage Management Information System Using K-Means has been successfully created, by applying the functions and objectives of the research conducted, from the results of this study it was found that the registration of prospective partners/franchises hooked gets the package Gold level according to the willingness and capacity of the desired prospective partner. The results showed that the Gold level generated on an arterial road with an employee capacity of 3 people from the results obtained an accuracy value of 98% according to the wishes of the franchise candidate. For suggestions for future development, namely changing the best algorithm method to keep up with future developments.

References

- Anggoro, D. T., Yunestri, R., & Chaniago, S. N. (2021). Perancangan Sistem Informasi Manajemen Stok Makanan Pada Restoran Bubur Ayam Doplangan. *Jurnal TIKom*, 2(1), 1–21. <https://osf.io/preprints/hm54b/%0Ahttps://osf.io/hm54b/download>
- Anjar Wanto, Muhammad Noor Hasan Siregar, A. P. (2020). *Data Mining Algoritma dan Implementasi*. Yayasan Kita Menulis.
- Bastian, A., Sujadi, H., & Febrianto, G. (2020). Penerapan Algoritma K-Means Clustering Analysis Pada Penyakit Menular Manusia (Studi Kasus Kabupaten Majalengka). *JTSIKOM*, 2(1), 26–32.
- Daniel Christian Natan, Martinus Edy Sianto*, I. G. (2021). PERBAIKAN SISTEM MANAJEMEN GUDANG DENGAN MERANCANG ULANG TATA LETAK, SISTEM PENYIMPANAN DAN PEMANFAATAN TEKNOLOGI RFID. *Jurnal Ilmiah Widya Teknik*, 20(2), 71–79.
- Davis, G. (1992). *Sistem Informasi Manajemen 1 & II* (Laudon (ed.); Vol. 1). Laudon Cipta.
- Dhewayani, F. N., Amelia, D., Alifah, D. N., Sari, B. N., & Jajuli, M. (2022). Implementasi K-Means Clustering untuk Pengelompokan Daerah Rawan Bencana Kebakaran

- Menggunakan Model CRISP-DM. *Jurnal Teknologi Dan Informasi*, 12(1), 64–77. <https://doi.org/10.34010/jati.v12i1.6674>
- Efriani, E., Ahyani, N., & Fattah, A. H. (2021). Implementasi Manajemen Sekolah untuk Meningkatkan Mutu Pendidikan di Tingkat Sekolah Menengah Pertama (SMP). *Pamator Journal*, 14(2), 117–121. <https://doi.org/10.21107/pamator.v14i2.11533>
- Ema Ainun Novia, Woro Isti Rahayu, C. P. (2020). *Sistem Perbancingan ALgoritma M-Means dengan Naive Bayes Untuk Memprediksi Prioritas Pembayaran Tagihan Rumah Sakit. Kreatif*.
- Haviluddin, H., Patandianan, S. J., Putra, G. M., Puspitasari, N., & Pakpahan, H. S. (2021). Implementasi Metode K-Means Untuk Pengelompokkan Rekomendasi Tugas Akhir. *Informatika Mulawarman: Jurnal Ilmiah Ilmu Komputer*, 16(1), 13. <https://doi.org/10.30872/jim.v16i1.5182>
- Marlina, D., Lina, N., Fernando, A., & Ramadhan, A. (2018). Implementasi Algoritma K-Medoids dan K-Means untuk Pengelompokkan Wilayah Sebaran Cacat pada Anak. *Jurnal CoreIT: Jurnal Hasil Penelitian Ilmu Komputer Dan Teknologi Informasi*, 4(2), 64. <https://doi.org/10.24014/coreit.v4i2.4498>
- Munir, Z., & Alfujianur. (2020). Sistem Informasi Manajemen Inventory Menerapkan Metode FEFO DI CV. PROSPERINDO Berbasis Website. *Jurnal Sistem Informasi Dan Manajemen*, 8(2), 119–126.
- Ningrum, D. R., Hayuhardhika, W., Putra, N., & Purnomo, W. (2020). Pengembangan Sistem Informasi Pemesanan Bahan Baku berbasis Android pada Franchise Qopee. *Pengembangan Teknologi Informasi Dan Ilmu Komputer*, 4(9), 2820–2827.
- Nur Aini Setyawati, J. (2021). Perancangan Program Penjualan Minuman Berbasis Web Pada Pt. Foods Beverages Indonesia. *Jurnal Akrab Juara*, 6(2), 22–32.
- Pertiwi, P. A., Darmansyah, D., & ... (2021). Penerapan Algoritma K-Means Clustering Dalam Pengelompokan Kasus Kenakalan Remaja (Studi Kasus Kejaksaaan Negeri Penajam Paser Utara). *J-Sim: Jurnal Sistem ...*, 4(2), 69–75. <http://ojs.stmik-borneo.ac.id/index.php/J-SIm/article/view/72>
- Purwayoga, V. (2020). Implementasi Algoritme K-Means untuk Evaluasi Kinerja Dosen pada Rancangan Sistem Informasi Manajemen (SIM) Kampus. *INTI TALAFA Jurnal Teknik Informatika*, 12(01), 5–9. <https://doi.org/10.32534/int.v12i01.1265>
- Pustaka, D., Hall, P., & Raymond, M. (2007). *Sistem informasi manajemen* (Reski Amin). TIM Publisher.
- Rohmah, A., Sembiring, F., & ... (2021). Implementasi Algoritma K-Means Clustering Analysis Untuk Menentukan Hambatan Pembelajaran Daring (Studi Kasus: Smk Yaspim *SISMATIK*, 2(6), 290–298. <https://sismatik.nusaputra.ac.id/index.php/sismatik/article/view/32>
- Suardi Mandai, W. A., Sinaga, T. H., & Hadinata, E. (2021). Penerapan Framework Materialize Css Dalam Sistem Pelayanan Dan Controlling Waralaba (Franchise) Fresh Milk Susu Ninja. *Djtechno: Jurnal Teknologi Informasi*, 2(2), 124–129. <https://doi.org/10.46576/djtechno.v2i2.1585>
- Subehan, N. (2020). Perancangan Sistem Informasi Franchise Berbasis Android,Php dan MySQL. *Jurnal Sistem Manajemen*, 2(1), 60–67.
- Sulistiyawati, A., & Supriyanto, E. (2021). Implementasi Algoritma K-means Clustring dalam Penentuan Siswa Kelas Unggulan. *Jurnal Tekno Kompak*, 15(2), 25. <https://doi.org/10.33365/jtk.v15i2.1162>
- Supardi, R., & Kanedi, I. (2020). Implementasi Metode Algoritma K-Means Clustering pada Toko Eidelweis. *Jurnal Teknologi Informasi*, 4(2), 270–277. <https://doi.org/10.36294/jurti.v4i2.1444>
- Susilo, Y., Wijayanti, E., & Santoso, S. (2021). Penerapan Transformasi Digital Pada Pemasaran Ekonomi Kreatif Kuliner Minuman Boba. *Jurnal Ekonomi Manajemen Sistem Informasi*, 2(4), 457–468.
- Sylfania, D. Y., Juniawan, F. P., & Yulanda, D. (2021). Implementasi Aplikasi Pemesanan Makanan Dan Minuman Pada Cafe La Banca Berbasis Android. *Jurnal Teknik Informasi*

- Dan Komputer (Tekinkom)*, 4(2), 144. <https://doi.org/10.37600/tekinkom.v4i2.318>
- Tjahyadi, R. (2018). Pengembangan Sistem Informasi Pada Manajemen Gudang Dalam Industri Manufaktur Menggunakan Teknologi Soa Dan Rfid. *Journal of Technology Information*, 4(2), 44–52. <https://doi.org/10.37365/it.v4i2.25>
- Worung, D. T., Sompie, S. R. U. A., & Jacobus, A. (2020). Implementasi K-Means dan K-NN pada Pengklasifikasian Citra Bunga. *Jurnal Teknik Informatika*, 15(3), 217–222.
- Wulandari, N., Farida, I. N., & ... (2022). Implementasi Metode K-Means Clustering Dalam Pengadaan Barang Di Toko N-Case. *Seminar Nasional Inovasi Teknologi*, 2(5), 308–313. <https://proceeding.unpkediri.ac.id/index.php/inotek/article/view/2534>