

Gym information system using collaborative filtering for supplement recommendations (THE ONE GYM CASE STUDY)

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Abstract—Gym and fitness are very important needs lately. Especially in today's era, where exercise is very important to increase endurance. The One Gym is a fitness center located on Jl. Bangau Pabean Sedati Sidoarjo. Currently, The One Gym still collects gym member data, recaps payments manually in books and does not yet use a system. Therefore, the purpose of this study is to design a website-based management information system where this system uses a collaborative filtering method. This information system will provide benefits not only to The One Gym but to new customers in the form of information needed and can be obtained quickly, precisely, completely and accurately which is certainly more effective and efficient without having to go through a difficult information search process. Based on the test results on the nine main functional aspects of the system, all features show a 99% success rate, which indicates that the system has met user needs and is ready to be implemented optimally.

Keywords—Collaborative Filtering; Gym; Member; Website

I. INTRODUCTION

In an era that is increasingly concerned with health and fitness, gyms or fitness centers have become part of the lifestyle of modern society. Gym, which is short for "gymnasium," is a facility that is specially designed and equipped with various sports equipment to support fitness activities, strength development, and overall health improvement. Along with the increasing awareness of the importance of maintaining fitness, the number of gyms and their members continues to grow, creating new needs in service management and optimization. The need for an integrated and easily accessible information system is becoming increasingly urgent along with the growth in the number of members and the complexity of gym facility management. One of the most commonly used information systems is a website-based information system, with the existence of an information system that is expected to help improve the performance of gym operations.

Currently, The One Gym still does manual data collection and recapitulation which is written and recorded in books. As a result, management becomes inefficient, prone to damage and data loss, lack of complete information, business owners must rely on manual processes to access the report. Knowing the weaknesses in the data collection system at The One Gym which is still done manually, the researcher intends to design a website-based management information system. This study proposes the design of a website-based information system that has several functionalities, namely: a menu ordering system and a personalized menu recommendation system. The recommendation system will be developed using the Item-Based Collaborative Filtering approach, then the membership registration system. Through this website, customers can make orders independently and receive menu suggestions, so that it can improve operational efficiency and customer experience. This information system will later provide benefits not only to The One Gym but also to new customers in the form of information that is needed and can be obtained quickly, precisely, completely and accurately which is certainly more effective and efficient without having to go through a difficult information search process.

II. LITERATURE REVIEW

This study refers to several related studies which are certainly relevant to the previous ones. In the study conducted by Herny Februariyanti, Aryo Dwi Laksono, Jati Sasongko Wibowo, Mardi Siswo Utomo (2021), they successfully implemented the collaborative filtering method for a sales recommendation system in a furniture store, which was proven to facilitate the sales process in the store.[1]

2.1. Collaborative Filtering

The main focus in collaborative filtering recommendation system is to utilize the opinion history of other active users to predict items that a user might like or be interested in. Recommendation system is basically a system that is useful for filtering and identifying items in the form of products, services or information that have great potential to be selected, purchased or used by users. There are several methods that can be used in building recommendation system, such as collaborative filtering (CF) which recommends items based on user similarity in terms of choosing or giving value to items and content-based filtering (CBF) which recommends items based on item similarity in terms of content or content

of items liked by users. Collaborative filtering method is a process for activities in evaluating items or filtering items using other people's perceptions or opinions.[1], [2], [3]

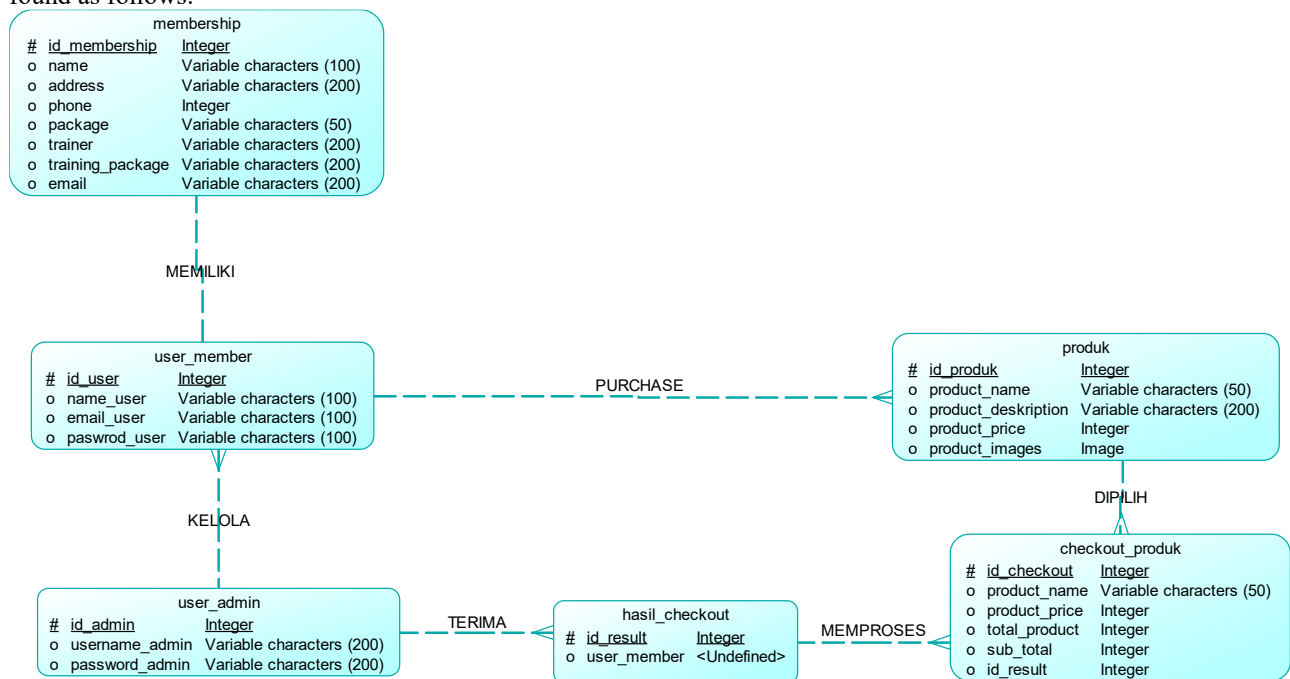
2.2. Gym

The definition of the gym itself refers to the term of a place where people can do various physical activities, especially doing sports. The gym also has a definition as a fitness center where many people come there to train their physical fitness and fitness. In the gym, people can do various types of physical exercises, such as weight lifting, cardio, running on a treadmill, stationary cycling and many more. Gyms are usually equipped with various fitness equipment, such as dumbbells, weight machines, cardio equipment, and more. [4], [5]

III. MATERIALS AND METHODS

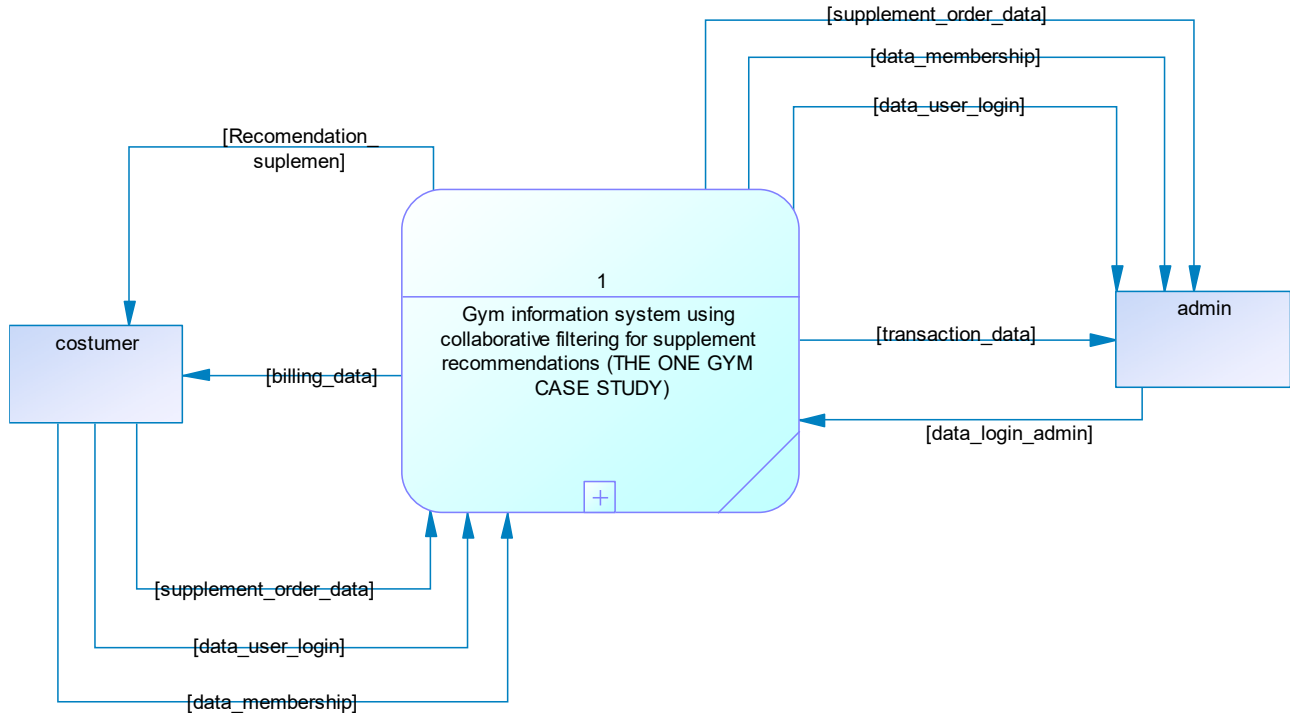
The research stages of the management information system at The One Gym using the collaborative filtering method will be built using a system creation method that is modeled in the form of a research flow diagram. The method used is the waterfall method. According to [6]Duma, the waterfall method is one of the approaches or models of software development that follows a structured and sequential flow. In the waterfall method, system development is carried out in stages, starting from the needs analysis stage to the implementation and testing stages. Each stage is carried out sequentially and must be completed before proceeding to the next stage.

Then there is the design stage, Design is the stage of translating the requirements into a software design that can be estimated. The design stage is carried out with the aim of connecting user needs with the implementation process by the developer to suit the needs required. The design that will be made uses a Data Flow Diagram (DFD), a database model, namely the Entity Relationship Diagram (ERD). The ERD or Entity Relationship Diagram that has been designed is found as follows:

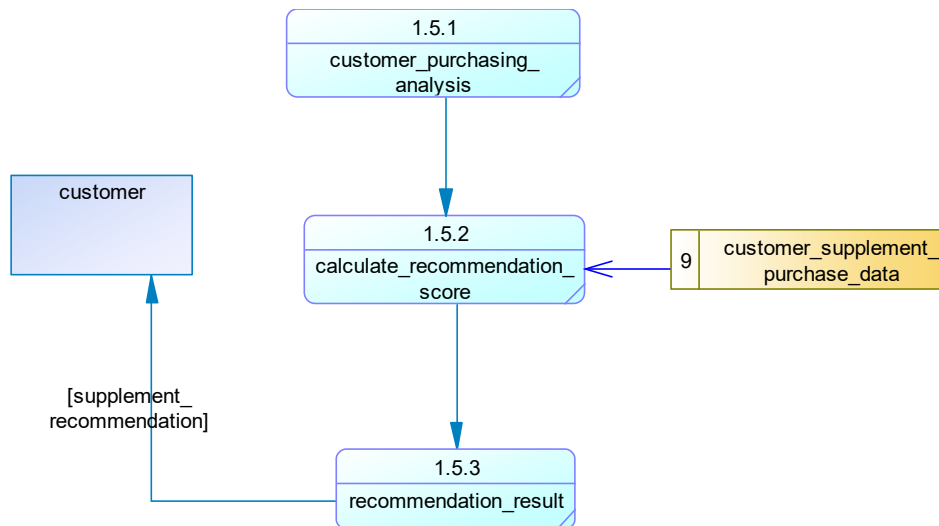


The database design above uses CDM or Conceptual Data Model which is used to describe the concept of the system database. In the CDM above, there is a product table that will later be used to apply the collaborative filtering method, this is because the table stores all product data in the system which can later be processed using the collaborative filtering method and can produce product recommendations to customers. Then the CDM or Conceptual Data Model is changed to a Physical Data Model or PDM, as follows.

Next is the DFD design of the system to be created, the following is a picture of the Context Diagram that has been created.



Gambar 3. 1 DFD Level context



Gambar 3. 2 DFD Level 2

After designing all database designs and dfd, the next stage is the implementation stage. At this stage it is called the coding stage or implementation stage. In the research that has been described, this coding stage will be built using the visual studio code editor as an idea or software used to create a program code in a computer

In this study, the creation of a management information system website at the one gym uses the PHP programming language and is assisted by several frameworks such as CSS and Bootstrap to facilitate its development. In the database section using MySQL, and also assisted by XAMPP to facilitate the PHP code run process. The software used to process the database of the system to be developed uses phpMyadmin. Then continued with the testing stage, at this stage is the stage used to conduct a trial of the system that has been built at the coding stage. In this study, the testing method used is the blackbox testing method. The textng method was chosen because blackbox testing is useful for ensuring that the software being tested is suitable for use and all the features provided have met the needs of the user and have also met functional needs

IV. RESULT AND DISCUSSION

4.1. Login page

This page can only be accessed by the gym admin to provide access to the website by entering the username and password that have been registered on the form on the display. The 'Login' button is used to enter the system with special access rights for the gym admin.

4.2. Admin Dashboard Page

This page is about the total number of customers who have registered for gym membership, then there is the number of each customer who has registered grouped from daily, monthly, and monthly + trainer, then there is also a display of customers who have recently joined or registered for membership.

Package	Count
Bulanan	2
Bulanan + Trainer	7
Harian	7

ID	Name	Package
1	eti	Bulanan + Trainer
2	susilo	Bulanan + Trainer
3	Susanto	Harian
4	pian	Harian
5	paoni	Bulanan

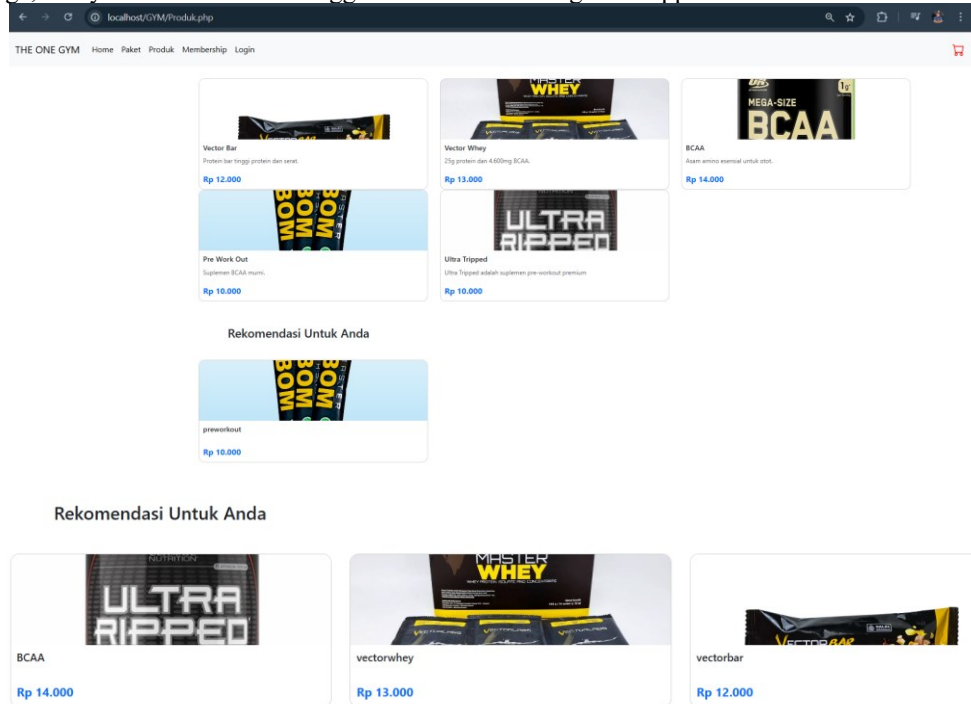
4.3. membership data page

This page contains the number of customers who have registered for membership. On this page, the admin can see all the data of registered customers.

ID	Nama	Alamat	No Telp	Paket	Trainer	Program	Action
56	mansur	Jalan pertama asih gang 2 nomer 34	2147483647	Bulanan + Trainer	Andi Pratama	Weight Training	Edit Delete
59	alif	jalan iwak beruk no 29	2147483647	Harian			Edit Delete
60	daffa Alfian	Kavling Perjuangan 2 No 28 Tambak Rejo	2147483647	Bulanan + Trainer	Sarah Wijaya	Weight Loss Program	Edit Delete
70	jarwo	Kavling Perjuangan 2 No 28 Tambak Rejo	2147483647	Harian			Edit Delete
75	Mansuri	Kavling Perjuangan 2 No 28 Tambak Rejo	2147483647	Bulanan			Edit Delete
76	huesoi	Perumahan Pondok Tjandra Indah, Jl. Tjandra Kirana VIII No.7, Surabaya 61256	2147483647	Bulanan			Edit Delete
78	satria	Perumahan Puncak Permai, Jl. Raya Darmo Permai I No.28, Surabaya 60226	2147483647	Bulanan + Trainer	Andi Pratama	Weight Loss Program	Edit Delete
88	ayiuu	Perumahan Pakuwon City, Jl. Grand Boulevard No.1, Surabaya 60112	2147483647	Bulanan + Trainer	Andi Pratama	Weight Training	Edit Delete

4.4. produk page

This product page is a display page where supplement products are displayed and can be purchased by customers. And on this page, every customer who has logged in to the website gets a supplement recommendation feature.



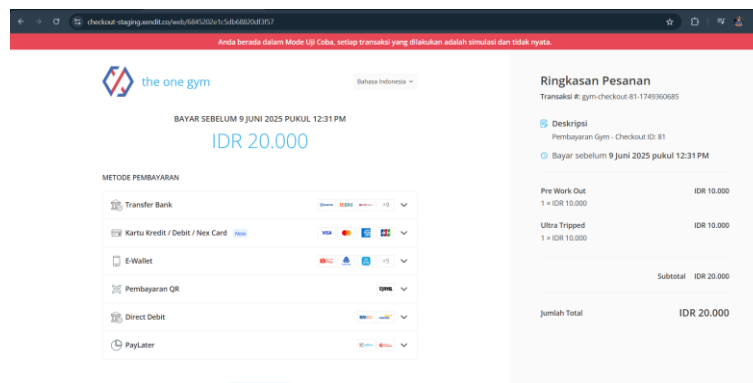
4.5. product checkout page

On this page, customers can order the selected supplement products and there is also a delete feature if they want to delete unwanted supplements, then if the customer is sure about the selected supplement, there is a finish shopping button feature.



4.6. product payment page

On this page, customers can choose any payment method ranging from bank transfer, credit card, E-wallet, QR Payment, etc.



V. CONCLUSION

From the results of the research and creation of a gym information system using collaborative filtering for supplement recommendations (CASE STUDY THE ONE GYM) the following conclusions were obtained:

1. The system was successfully designed in the form of a website. Where the system has been implemented well and the system can also be run to customers.
2. A system has been created where when customers register for membership, a system option will appear to choose a trainer and training package
3. Users can make orders with the help of collaborative filtering recommendations well because the system helps provide item recommendations, namely supplements

From the results of the gym information system analysis using collaborative filtering for supplement recommendations (THE ONE GYM CASE STUDY), it is hoped that there will be a development of collaborative filtering with a user-based collaborative filtering approach so that the system can display more accurate recommendations to prospective customers because it uses two approaches, namely the item-based collaborative filtering approach and user-based collaborative filtering or commonly called using the hybrid method.

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