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ONLINE INFORMATION DELIVERY SERVICE SYSTEM DESIGN USING WEB-BASED FORWARD CHAINING METHOD IN PHARMACEUTICAL COMPANIES

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ABSTRACT
This online complaint or information submission application is a web-based application which is useful to assist employees obtain information online. Currently, the complaint and information submission are still using the old method by asking the question through the relevant employees manually. This way is inefficient in terms of time due to some employees are not always available in place. Therefore, with the development of technology, it encourages the researcher to design web-based application system which is useful for assisting employees to submit complaint and information. This design process using a Navigation Structure, Unified Modeling Language and Forward Chaining method as a data processor. Out of the two technology that have been tested (laptop and smartphone), this application works well on laptop, while on smartphone, the button layout does not appear, as well the display it does not respond horizontally or vertically. This application will be assist the pharmaceutical company employees to submit information and complaints anytime and anywhere easier.
Keywords: *Forward Chaining, Information Services, Web.*

1. Introduction

In the business world and companies with a large number of employees, there will certainly be many problems. There are various kinds of problems or complaints. Problems or complaints experienced by employees that seem small can become big if they are not handled properly. Because the scope is so broad, the scope of complaints in this paper is limited to the service sector in the company. And more focused on employees and management(Aboramadan & Karatepe, 2021; Agarwal, 2021).

Basically, the boss is the first person to accommodate employee complaints. If the complaint that occurs is within the scope of work, it may be handled by the superior himself. For that there are several approaches that can be applied. Identify which employees often complain, about what, why employees complain, to whom employees complain and which complaints can affect individual work or work teams and when complaints start to occur. Record every employee complaint and make a priority scale for handling it and adjust it to the area and level of the complaint. Complaints should not be judged as something negative. Even complaints can be a feedback that can provide positive things in improving policies and can create a more comfortable work environment(Fuoli, et al., 2021; O'Dowd, et al., 2021; Wray, et al., 2022).

Handling complaints can be done by the management. The solution must be seen as an effort to improve the quality and performance of employees that can be integrated into a quality management system(Jeanpert, et al., 2021; Decock, et al., 2021). With this system, the company is not only expected to be able to respond to complaints but also to have high sensitivity. In addition, the company can not only find the cause of the complaint, but can also take advantage of the information obtained. Through the quality management system, it allows companies to review the differences in stages and weaknesses of existing processes or services for employees. Delaying the handling of complaints that occur even by letting them be is tantamount to increasing the number of complaints or problems that are getting bigger and bigger. And employees can actually be included by the management to be able to overcome complaints or problems that

occur. This is also part of the recognition or trust the company gives to employees(Djurkovic, et al., 2021; Chen & Greitens, 2022).

Based on this statement, it is necessary to have a system that can be used to accommodate various complaints from employees in order to make it easier for the company to process various kinds of complaints received. complaints from employees so that these complaints can be followed up quickly.

2. Literature Review

2.1. Definition of Service

Service is an activity or sequence of activities that can occur in a person's direct interaction with other people or with physical machines and can provide customer satisfaction. Service according to the Big Indonesian Language Dictionary (KBBI) is an effort to help prepare or take care of what other people need(Remme, et al., 2021).

2.2. Definition of Information Submission

The word information can literally be interpreted as a message, while literally it can be interpreted as a description of the problem / object / event that is conveyed with the aim of knowing or understanding better. Broadly speaking, the meaning of the delivery of information as notification, presentation of reports, providing counseling, delivering announcements, giving directions, or simply delivering news.

Information about objects, events or problems can be conveyed to others in the form of information for the following reasons:

1. Contains elements of novelty (actual).
2. Beneficial for public interest or human interest.
3. In the form of knowledge that can be applied in everyday life (practical).
4. Aims to increase knowledge or experience of others (knowledge).
5. Can be justified scientifically through evidence in the field (valid).
6. Does not contain exceptions that result in adverse errors (side effects).

According to the Big Indonesian Dictionary (KBBI) delivery is a process, method, act to convey while information is information, notification, news or news about something

2.3. Definition of Design

Design is the process of developing a specification based on the recommendations from the system analysis. Design is a description of planning and sketching or arranging several separate elements into a unified whole and functioning. The system design can be designed in the form of a system flowchart, which is a graphical tool used to explain the process sequence of the system.

2.4. System Definition

The system is a collection of elements consisting of data, human resources, a network of interconnected procedures, hardware and software technologies that interact as a unit to produce the same goal.

The elements that represent a system in general are input (input), processing (processing), output (output). This can be illustrated as in Figure 2.1.

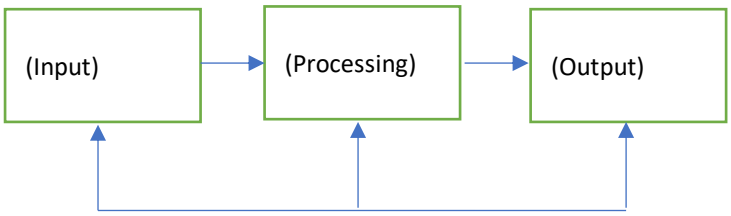

Fig. 1. System Model

2.5. Forward Chaining Method

Forward Chaining is one of the reasoning methods used in the inference engine, where this reasoning method starts with data and reasons to lead to an answer or conclusion. This method can also be described logically as a repetition of the ponen mode logic. The inference engine that uses the Forward Chaining method will look for rules until one antecedent (if clause) is found that is true (true). When a rule is found, the inference engine can make conclusions on the existing data. Forward chaining is matching facts or statements starting from the left (IF first). In other words, reasoning starts from the facts first to test the truth of the hypothesis(Garcia, et al., 2021; Wulansari, et al., 2022).

As for previous research related to fordward chaining, the design of this game aims to provide education to anyone who plays it. The data used in this game is based on the experience of the author who is directly active in the Mulawarman University Informatics lecture. The stages in making this game are Concept, Design, Game Development and testing. The basic concept in making this game is about high school students who will continue their education to the lecture level, therefore this game is designed to have a possible mechanism with lecture requirements at Mulawarman University Informatics. The method used in this game is the Forward Chaining method which is used when the player will move up to the next semester (level) and to determine the value in each semester (level). The results obtained from the Black Box testing are that all systems run well in terms of appearance, design, gameplay, and the Forward Chaining method(Firdaus, et al., 2021).

Education is a very important thing for a human being, with the development of the world today requires everyone to have the highest possible education. Ease in all activities and work is something that humans really want, without a good education, it is difficult to get all these conveniences. Major is a student's choice that must be adjusted to his interests and talents, so in this case the choice of major is very important for the future of a student who will continue his studies to college. But in fact the decisions taken in choosing majors often cause problems, due to the majors taken only following the choice of their friends or on the basis of coercion from their parents. This causes many students who feel that they are not in line with expectations or abilities and want to change majors. For this reason, an expert system application is made that can provide convenience for students in determining their college majors and can help find out what intelligence the student has. The method used in making this expert system is the Forward Chaining method. With the existence of an expert system to determine majors based on interests and talents, this can help students in determining the choice of majors and knowing their intelligence without having to meet directly with a psychologist(Mulyani, et al., 2021; Nurhayati & Noorlimayanti, 2022).

3. Research Methods

The research methodology is the design of research activities to find out the results of each specific problem with the aim of being able to answer questions from the existing problems. This research methodology is described in the form of a framework. This study uses a research framework that can be seen in Figure 2:

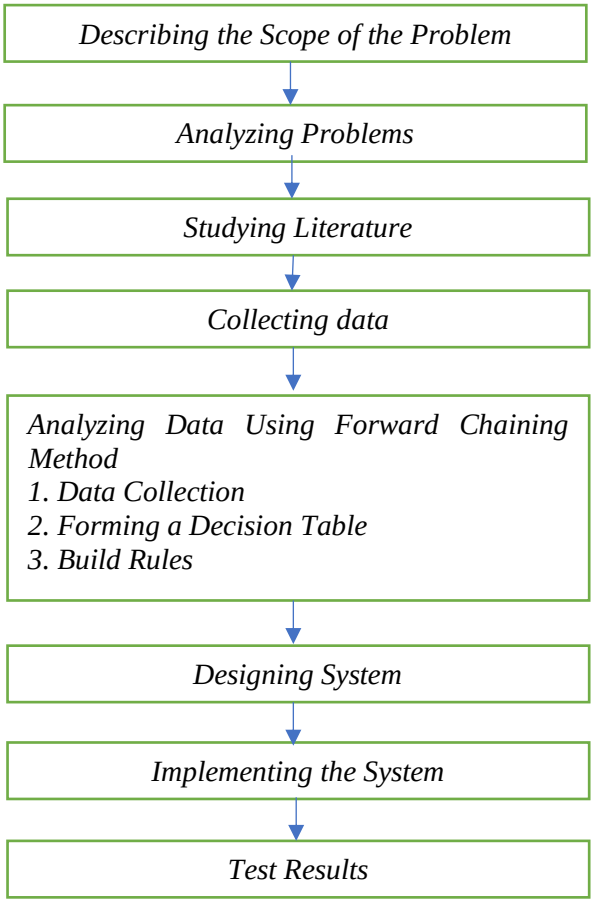

Fig. 2. The Form of a Framework

4. Results and Discussions

The stages carried out on the results of research and discussion are as follows:

a) Data Analysis

The data needed in this study is data on complaints to employees and solutions obtained from interviews with related sections. The following is a list of several complaints from employees which can be seen in Table 1.

Table 1 - Ticket Data

No	Code Ticket	Name Ticket
1	T01	BPJS
2	T02	ASURANSI
3	T03	ID_CARD
4	T04	PRINTER
5	T05	LIFT
6	T06	AC
7	T07	SLIP

Obtained 7 types of complaints that often occur, each type of complaint is given the initial code T01 to T07 as shown in Table 1. The following are the various types of complaints:

Table 2 -Types of Complaints

NO	Complaint Code	Complaint Name
1	K01	How to register BPJS for normal newborns
2	K02	How to register BPJS for newborns with congenital cases
3	K03	How to register for new employee BPJS
4	K04	How to reimburse glasses
5	K05	How to reimburse hospital costs
6	K06	ID card lost
7	K07	I left my ID card
8	K08	Printer broken
9	K09	Printer not connected
10	K10	Printer ink runs out
11	K11	Elevator broken
12	K12	Dirty Elevator
13	K13	AC is broken
14	K14	dirty air conditioner
15	K15	Underpaid slip
16	K16	Print out slip

There are as many as 16 complaints that can be the cause of the ticket in table 1. Complaints are given initials in the form of codes K01 to K16 in table 2.
Next is the making of rules or rules for detecting complaints on employees which can be seen in Table 3.

Table 3 - Rule Forward Chaining

NO	RULE
1	IF K01 is true AND K02 is true AND K03 is true THEN T01
2	IF K04 is true AND K05 is true THEN T02
3	IF K06 is true AND K07 is true THEN T03
4	IF K08 is true AND K09 is true AND K10 is true THEN T04
5	IF K11 is true AND K12 is true THEN T05
6	IF K13 is true AND K14 is true THEN T06
7	IF K15 is true AND K16 is true THEN T07

In Table 3. In determining the rules, there are 7 rules to determine the type of complaint ticket for employees based on employee complaints. After determining the rule using the Forward Chaining method, data testing and determining the type of employee data ticket1 will be carried out in table 4.

Table 4 - Testing Data

No	Employee Data	Complaint	Ticket Type
1	Employee 1	How to reimburse glasses how to reimburse hospital costs	Insurance

In Table 4. there is employee data1 with complaints How to reimburse glasses, how to reimburse hospital costs, then the following rule tracking process is carried out:
Rule 1 = IF K01 is true AND K02 is true AND K03 is true AND K04 is true THEN T01 = no data match was found

Rule 2 = IF K04 is true AND K05 is true THEN T02 = data match is found then the search is immediately stopped.
Based on the tracking rule for employee1, the results obtained are in accordance with rule 2 with the type of ticket, namely Insurance.

b) Designing System

System design will produce a system that can be used to process and analyze research in a computerized way. In this study, several steps were taken to design the system to be made, including using the Unified Modeling Language (UML) in the form of Use Case Diagrams, Class Diagrams and Sequence Diagrams, Navigation Structures and Input and Output Design.

c) Unified Modeling Language (UML)

In this website there are two actors who play a role, namely the user and the admin. Admin is a user who can add, change and delete employee, department, position, ticket type, and administrator data on the employee ticket application. Meanwhile, the user is a user who can play a role in viewing employee data and filling out tickets.
To create a system that can run well and in accordance with the desired expectations, it must first be made a system planning stage using use case diagrams, class diagrams and sequence diagrams.

d) Use Case Diagram

In the use case diagram of the Employee Ticket Application, there are several main things such as users and admins who are interrelated in the database system so that the data is always updated. Use case diagram of Employee Ticket Application can be seen in Figure 3.

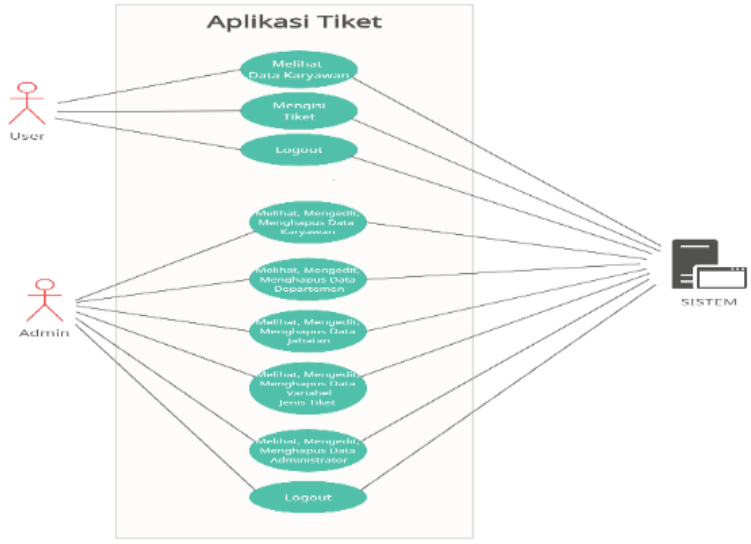

Fig. 3. Employee Ticket Application Use Case Diagram

e) Class Diagram

The design of the Employee Ticket Application class diagram is a specification that will produce an object and is the core of object-oriented development and design which can be seen in Figure 4.

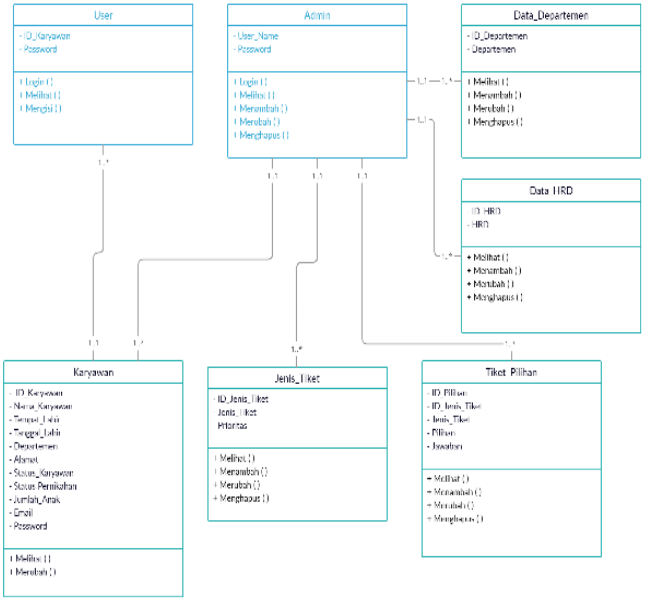

Fig. 4. Employee Ticket Application Class Diagram

f) Sequence Diagram

Sequence diagram design is an interaction diagram that explains how an operation is performed. The design of the sequence diagram in the Employee Ticket Application consists of two, namely the sequence diagram for the user and the sequence diagram for the admin.

The design of the sequence diagram for the user can be seen in Figure 5

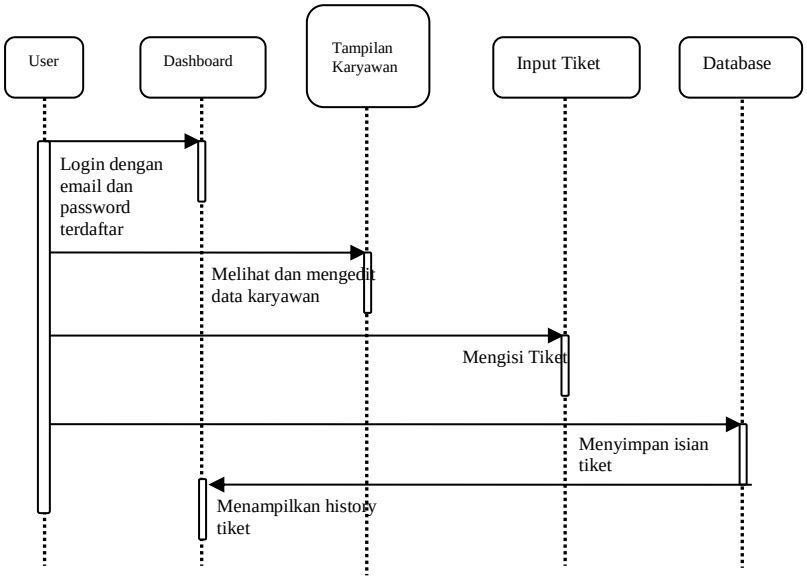

Fig. 5. Employee Ticket Application User Sequence Diagram

The admin sequence diagram design can be seen in Figure 6.

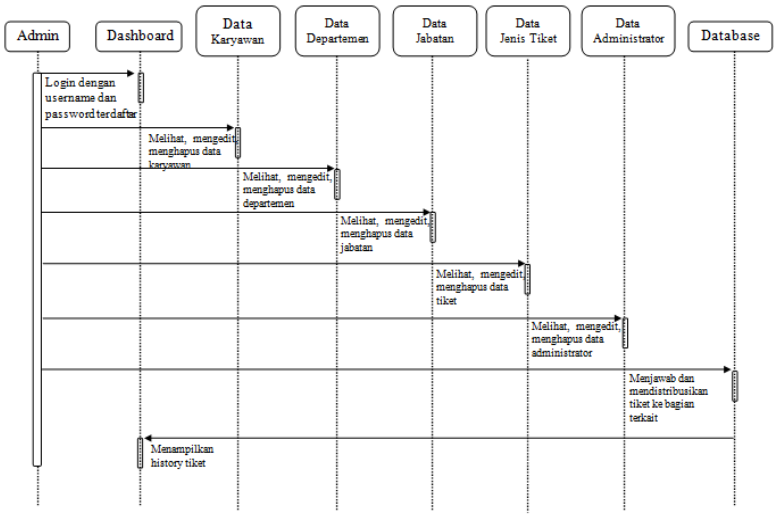

Fig. 6. Employee Ticket Application Admin Sequence Diagram

g) Implementing the System

Implementation of the system is carried out to compare the results of the analysis obtained manually with the results of using the system. The implementation stages are divided into several stages, namely:

Register for hosting at Dewa web by registering the domain name pharmacyindonesia.xyz. After the domain is active, the next step is to fill in the domain with the system that has been created on the local computer. How to publish and system management to the domain is done online. The step that must be taken is to enter the domain by entering the hosting account user and password through the cpanel application that has been provided by the internet service company. How to enter the domain is to use a browser application on the computer. Can use Mozilla Firefox Browser or Google Chrome Browser. Then type the domain address and call the cpanel application in the browser address bar.

At the initial display, you are required to fill in an account in the form of an account name and password in order to access the registered domain web server. User accounts and passwords are provided specifically for domain registrants by hosting service companies.

The following are the steps for uploading program code files from a local computer to a web server through the file manager facility in cpanel. Make sure the position of all program code files is in the main folder, namely public_html. If the file is outside the folder, the web system cannot run. Select the UPLOAD menu then appears in the menu to upload the program code file from the program computer. Then the main file on the web system must be named index.php because it conforms to the standard rules in general configurations using that name.

The next step is to create a database on a web server via the cpanel page. The first step is to select the database menu. After selecting the database menu page then asked to name the database for the application. The MySQL database has a way of working where the database can only be accessed by the database user account where access rights have been granted. After successfully creating a new database on the MySQL database server, the next step is to process the database using the phpmyadmin editor. Because the database was previously created on a local computer, then you can then import it into the web database server.

h) Employee Ticket Application Testing

The last stage of the research system that is built is testing. This system is tested to see the functions and appearances that are generated from the employee ticket application that has

been created. The purpose of testing an application is to find out whether the application is running and working as expected. Trial of employee ticketing application using Google Chrome browser.The following is a test result of a comparison of the appearance of the employee ticket application carried out on a laptop using the Google Chrome browser and on a smartphone using the Google Chrome browser.

Table 5 - Comparison of Application Display on Laptops and Smartphones

No.	Test	Laptop	Smartphone
1	User Dashboard Page	The display is in accordance with the design and the results can be seen in L.1.1.	The display is in accordance with the design and the results can be seen in L.2.1.
2	Admin Dashboard Page	The display is in accordance with the design and the results can be seen in L.1.2.	The display is in accordance with the design and the results can be seen in L.2.2.
3	Employee Show Page	The display is in accordance with the design and the results can be seen in L.1.3.	The display is in accordance with the design and the results can be seen in L.2.3.
4	Ticket Input Page	The display is in accordance with the design and the results can be seen in L.1.3.	The display is in accordance with the design and the results can be seen in L.2.4.
5	Employee Page	The display is in accordance with the design and the results can be seen in L.1.4..	The display is in accordance with the design and the results can be seen in L.2.5.
6	Department Page	The display is in accordance with the design and the results can be seen in L.1.5.	The display is in accordance with the design and the results can be seen in L.2.6.
7	HR page	The display is in accordance with the design and the results can be seen in L.1.6.	The display is in accordance with the design and the results can be seen in L.2.7.
8	Ticket Page	The display is in accordance with the design and the results can be seen in L.1.7.	The display is in accordance with the design and the results can be seen in L.2.8.
9	Ticket Type Page	The display is in accordance with the design and the results can be seen in L.1.8.	The display is in accordance with the design and the results can be seen in L.2.9.
10	Ticket Selection Page	The display is in accordance with the design and the results can be seen in L.1.9.	The display is in accordance with the design and the results can be seen in L.2.10.
11	Administrator Page	The display is in accordance with the design and the results can be seen in L.1.10.	The display is in accordance with the design and the results can be seen in L.2.11.
12	Report Page	The display is in accordance with the design and the results can be seen in L.1.11.	The display is in accordance with the design and the results can be seen in L.2.12.

5. Conclusion

Based on all the steps of the research framework that have been carried out, several conclusions can be obtained from the employee ticket application that has been made, as follows: The formation of this application helps users and admins in solving problems faced in general become easier and faster. With an application that can answer automatically, help the admin section answer ticket input quickly. The appearance of this application looks good and in accordance with the design when using a laptop, while the display using a smartphone even though using the same browser is not responsive.

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