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WEB-BASED EMPLOYEE LEAVE APPLICATION SYSTEM AT THE DINAS PENANAMAN MODAL DAN PELAYANAN TERPADU SATU PINTU KOTA MEDAN

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ABSTRACT

Agencies must effectively manage employee leave management as one of their important responsibilities. Currently, many agencies, including the Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu (DPMPTSP) Kota Medan, still use manual methods in handling employee leave applications, namely by manually creating leave letters using templates and submitting them to the Head of the Personnel Sub-Division for approval. This manual process is time-consuming, prone to errors, and makes it difficult to manage leave data. To overcome this problem, a web-based employee-leave application system at DPMPTSP Medan uses the PHP programming language and MySQL database. The design of this website involves several stages, including interviews, data collection, observation, and data analysis. The design of the employee leave website is then carried out by analyzing and designing each component using UML. This system is designed to simplify the leave application process, provide easier access to employees, and minimize administrative errors. The results of this study indicate that the developed system has succeeded in increasing the efficiency of the leave application process. Functional and security tests conducted showed that the application functions according to specifications and is able to maintain data integrity. This system makes it easier for employees to apply for leave because it can be done anywhere and allows the personnel department to verify and approve applications more quickly and accurately.

Keywords: Leave Request, Employees, DPMPTSP Medan, Web-Based Application

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1. INTRODUCTION

The development of information media is currently increasing rapidly, therefore it is a must for an agency to utilize information technology as a basis for data processing in order to be able to follow the development of information in the current global era (Mulyani & Haliza, 2021) . Information technology was created with the aim of making things easier for humans. in completing and carrying out various forms of work activities. Information that now guides decision making can produce knowledge within the organization and thus, is very important for the continuity of an agency's activities (Yuni, 2021).

One of the information systems that can be used as a means of flexible work management is website-based information. The use of Information Technology can also be used to help manage leave for employees in an agency to help increase efficiency and reduce errors (Rachman & Effiyaldi, 2023).

Leave is one of the rights of employees or staff in all existing companies, leave is not coming to work with permission from superiors for a certain period of time, permitted in an effort to ensure spiritual and physical fitness and the interests of employees. Every employee has the right to take leave that is owned by the respective agencies where they work (Agusniar et al., 2023). Several types of leave that can be taken by employees, and the requirements that are met include annual leave, long leave, sick leave, maternity leave. leave for important reasons (Saryanti, 2023). Leave is a condition for a person to not go to work due to annual leave, maternity leave, vacation or other reasons of interest that are officially permitted for a certain period of time (Achmad & Amaliyah, 2023).

Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu (DPMPTSP) Kota Medan is a government agency in North Sumatra that carries out government affairs in the field of Investment in Medan and with the strategic target of improving the investment climate and quality of licensing services in Medan (Wahyudi & Muhammad, 2022). Creating a conducive environment to support investment. This office still uses a manual leave application system and is still paper-based, employees who want to apply for leave must first print the form and then fill it out. After filling out the form, the form can be submitted to the personnel department, the form will be verified and the Head of the Personnel Sub-Division for approval. This process not only takes a significant amount of time, but also has the potential to result in errors and complicate the management of employee leave data.

Based on these conditions, this study was conducted to design and implement a modern and more efficient web-based leave application information system. By using a website-based system, it is expected that the leave application process can be carried out faster, more efficiently, and with minimal errors. This study is based on the need to improve the leave management process at the DPMPTSP Medan which currently still uses manual methods, which are clearly no longer effective in dealing with the dynamics of an increasingly digital and modern work environment.

Previous research, such as that conducted by (Bahrody et al., 2020) stated that computerized systems are the best solution to solve existing problems so that they are more effective and efficient as a medium for implementing leave, processing, and storing leave data. Another study by (Amrilah & Jaya, 2022) concluded that the Employee Leave Application Information System at the South Sumatra Regional Revenue Agency makes it easier for employees to apply for leave and the possibility of errors in recording by the administration is quite large because of the large number of letters that must be inputted. Furthermore, (Amri & Reza, 2022) in their research stated that by developing a system or creating an application in this company, it can support the company's productivity in terms of submitting leave to be more effective and efficient and facilitate the documentation of employee leave data by the company.

Research by (Asworowati et al., 2023) concluded that building a personnel information system that uses an automated system that integrates all attendance, salary and leave application data and can produce information in the form of the required reports so that the reports presented can be fast and accurate. In the study (Raditya & Hamzah, 2024) also concluded that the employee leave application system application produces an employee leave application information system that can be more effective in managing employee leave data and can overcome human error problems. And

another study by (Juniar et al., 2024) also concluded that the Web-based Leave Application Information System that simplifies the leave application process to increase efficiency in employee administration at PT. Asia Petrocom Services. With this system, it can minimize miscommunication between employees and HRD/superiors.

2. LITERATURE REVIEW

2.1. Website

A web server is a software on a server that functions to receive requests in the form of web pages via HTTP or HTTPS from clients known as web browsers and sends back (response) the results in the form of web pages which are generally in the form of HTML documents. Website is a collection of pages containing information in the form of text, images, videos, etc., which can be accessed anywhere, anytime and by anyone with the help of internet technology (Rahmi et al., 2023). This website will be the main interface for users (employees, admins, and department heads) to apply, process, and verify leave. Website is one of the applications that contains multimedia documents (text, images, sound, animation, video) in it that uses the HTTP protocol (hyper transfer protocol) and to access it uses software called a browser. The functions of the website include: Promotional media, marketing, information, education and communication.

To create a website, the first thing to know is to know the tasks and scope of creating a website. For the definition of a website itself, there are many, but they don't have to be memorized. To create a website, several roles are actually needed to carry out their respective tasks. Because there are many roles in creating a website.

2.2. Database

A database is a system that is created to organize, store and retrieve data easily. A database consists of a collection of data organized for 1 or more uses, in the form of digital (Ramadhan & Mukhaiyar, 2020). If the website created is desired to be more dynamic, then a database is needed for data processing. Database is a collection of information that is arranged in a certain way so that a computer program can quickly select the desired data. A database can be likened to an electronic filing system. A traditional database consists of fields, records, and files. A field is a particular item of information; a record is a collection of fields; and a file is a collection of records. For example, a telephone book can be likened to a file consisting of many records and each record consists of three fields, namely name, address, and telephone number. An alternative concept of database design is called hypertext. In a hypertext database, each object, whether it is text, image or movie, can be linked to other objects. Hypertext databases are very useful for organizing very large amounts of information but are not used in numerical analysis. To access information from a database, a data base management system (DBMS) is needed. DBMS is a collection of programs that allows users to enter, organize, or select data from a database.

Database structure is the way data is organized to make data processing more efficient. A database management system (DBMS) is a software application that stores the structure of the database, the relationships between the data in the database, and the names of forms, data types, decimal places, number of characters, default values, and all other field descriptions. Databases can make it easier for users and administrators to enter, delete, edit, display, and search for data. Some database programs that can be used to create a website include: Oracle, SQL Server, and MySQL.

2.3. PHP

Understanding PHP, PHP is a server-side scripting language, a programming language used to develop static websites or dynamic websites or Web applications. PHP stands for Hypertext Pre-processor, previously called Personal Home Pages. The script itself is a set of programming instructions that are interpreted at runtime. While the scripting language is a language that interprets scripts at runtime. And usually embedded in other software environments.

Because PHP is a server-side scripting, this type of programming language will later be run/processed by the server. Unlike JavaScript which is client-side. PHP is a general programming language which means PHP can be embedded into HTML code, or can be used in combination with various web template systems, web content management systems, and web frameworks. PHP stands for Hypertext Preprocessor, a high-level scripting language that is installed on HTML documents. In general, the syntax in PHP is similar to C, Java and Perl, but in PHP there are several more specific functions (Sandria et al., 2023). PHP is used to manage application logic, process requests from users, and connect applications to databases.

2.4. MySQL

MySQL is a database server program that is able to receive and send data very quickly, multi-user and uses basic SQL (Structured Query Language) commands. MySQL is in two forms of license, namely FreeSoftware and Shareware. The MySQL that we usually use is MySQL FreeSoftware which is under the GNU/GPL (General Public License) License. MySQL is a free database server, meaning that we are free to use this database for personal or business purposes without having to buy or pay for the license. MySQL was first pioneered by a database programmer named Michael Widenius. In addition to database servers, MySQL is also a program that can access a MySQL database that is positioned as a Server, which means that our program is positioned as a Client. So MySQL is a database that can be used as a Client or server. The MySQL database is a database software in the form of a relational database or called a Relational Database Management System (RDBMS) that uses a query language called SQL (Structured Query Language).

MySQL is a database or data storage medium that supports PHP scripts. MySQL also has a simple query or SQL (Structured Query Language) language and uses the same escape characters as PHP, besides MySQL is the fastest database today (Fitria, 2021). MySQL is used as a database management system to store all data related to leave applications, leave history, and employee data. This database is integrated with a web application to enable data storage and management online efficient.

2.5. XAMPP

XAMPP is open-source software which supports many operating systems and is a compilation of several programs. XAMPP's function is as a stand-alone server (localhost), which consists of several programs (Hartiwati, 2022). XAMPP provides a local server (localhost) to run web applications during the development phase. XAMPP includes Apache as a web server, MySQL as a database, and PHP as a programming language used in this study. To be able to run PHP files on a local Windows-based computer, we can use XAMPP or WAMPServer. XAMPP is software that functions to run the role of a local web server, which means localhost on a computer that plays a role in running a web server and also a database.

3. METHOD

The following is a picture of the research framework can be seen in Figure 1.

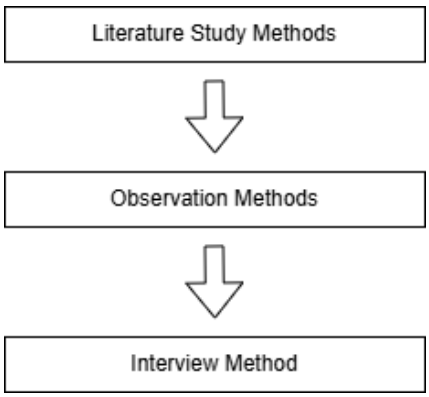

Figure 1. Research Framework

The stages of the research methodology that the author conducted at DP M PTSP Medan City are as follows:

1) Literature Study Methods
   The author conducted literature research by collecting and analyzing various sources such as books, journals, theses, theses, and other related literature that support the development of web-based information systems. This study helps provide a theoretical basis and provides an in-depth understanding of the principles of information technology used in the system to be built, including the use of UML (Unified Modeling Language) to design the system. The literature reviewed also includes discussions on databases, system architecture, and web-based application development. which is relevant to this research.
2) Observation Methods
   The author conducted direct observation at the relevant agency, namely DPMPTSP Medan, to gain a better understanding of the employee leave application flow. From this observation, the author obtained information about how the leave application process is carried out manually, as well as the obstacles faced in managing leave data. This information is the basis for designing a system that suits the needs of agency.
3) Method Interview
   The author conducted interviews with employees at DPMPTSP Medan to obtain more accurate data related to user needs. This interview aims to find out the main problems faced by employees related to leave management, as well as to identify the features needed in the leave management information system to be built. Through this interview, the author also confirmed the workflow that will later be accommodated in the system.
4) Unified Modeling Language (UML)
   In system development, the author uses UML to design and document the system in detail. The UML diagram used is the Usecase Diagram which is used to describe the interaction between users (employees, department heads, and personnel admins) with the system. This diagram helps map the functions which must be present in the system according to user needs.

Previously, the manual leave process that was running was described by a flowchart as follows:

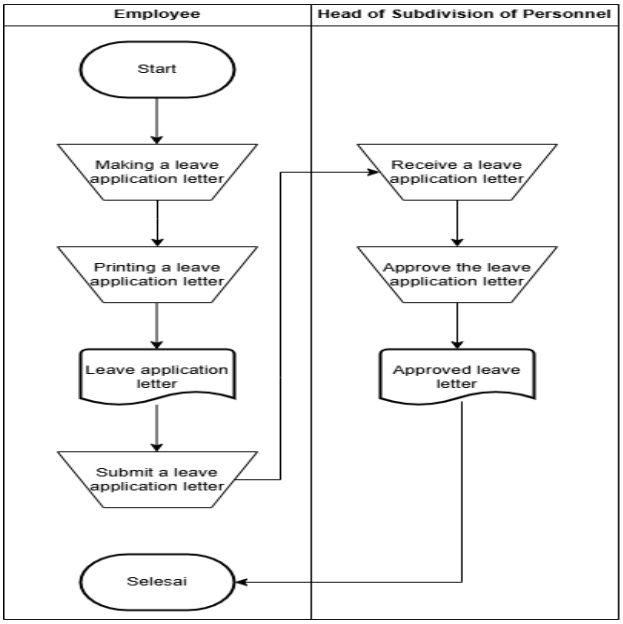

Figure 2. Running Leave Flowchart

The flowchart of the proposed leave application procedure is depicted as follows:

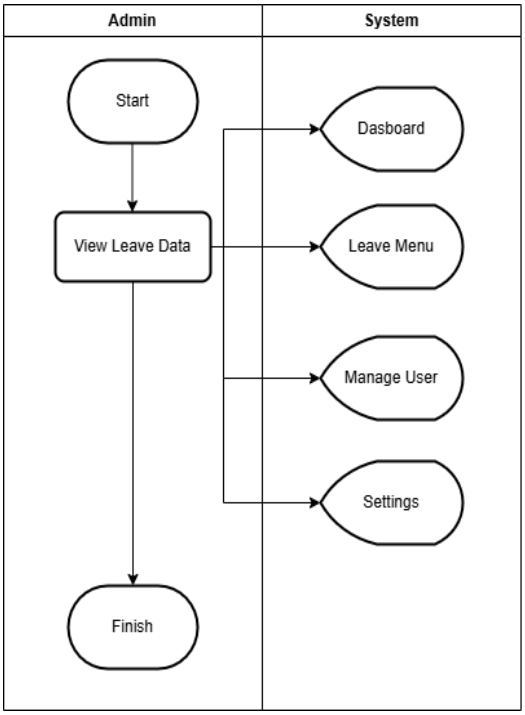

Figure 3. Proposed Leave Flowchart for Admins

The proposed system flowchart for the employee leave application process is described as follows:

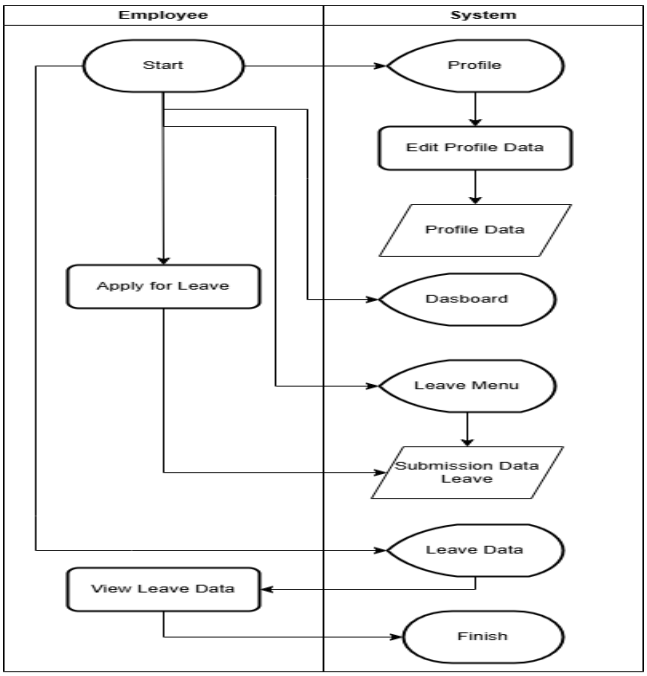

Figure 4. Proposed Leave Flowchart for Employees

Figure 3. Proposed Leave Flowchart for Employees

The flow of employee leaves applications proposed to management is described in the following flowchart:

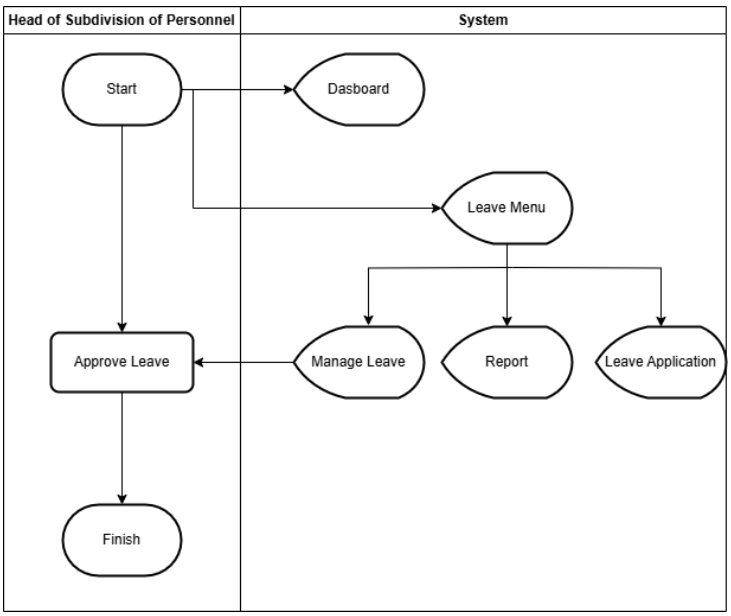

Figure 5. Proposed Leave Flowchart for the Head of Employee Sub-Division

3.1. Use Case Diagram

Use Case Diagram is an initial design that displays various roles or interactions of the system with actors and can also determine how these roles function in a system (Permana et al., 2023).

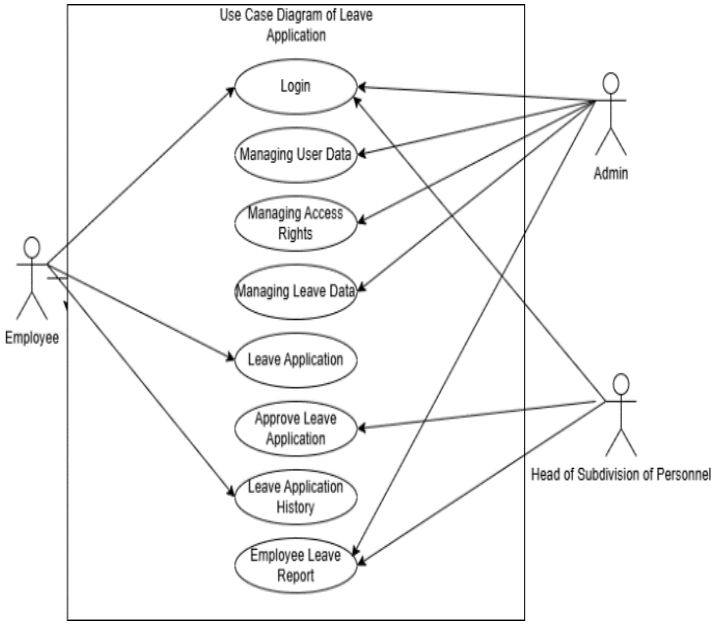

Figure 6. Usecase Diagram of the Leave System

4. RESULTS AND DISCUSSION

The following are the results of the implementation of the system web-based employee leave application system at the

4.1 Login page

When running this web application, the first page that will appear is the Login page. The login page functions so that users can enter the username and password that have been registered by the admin of this website in order to enter the home page and avoid unknown strangers who want to access and disrupt the contents of the website.

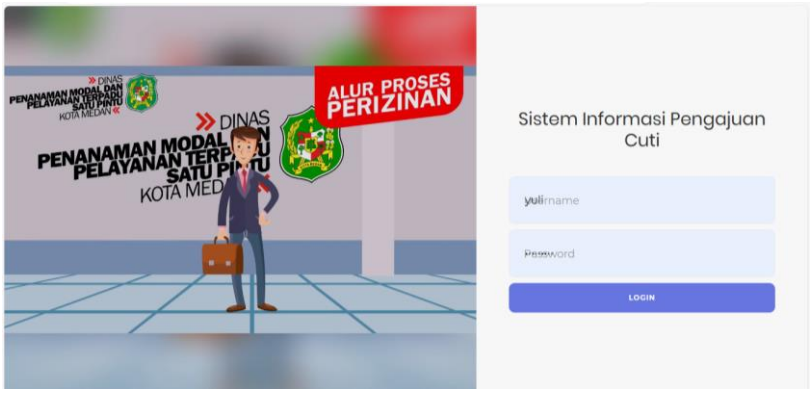

Figure 7. Login Display

Table 1. Login Table Description

Actors	Description
Admin, Staff and Head of Personnel Sub-Division	Login by entering username and password

4.2 Admin Page View

The admin page display contains the dashboard, Leave Menu, Manage User, and settings. The admin homepage displays information about the number of Leave requests.

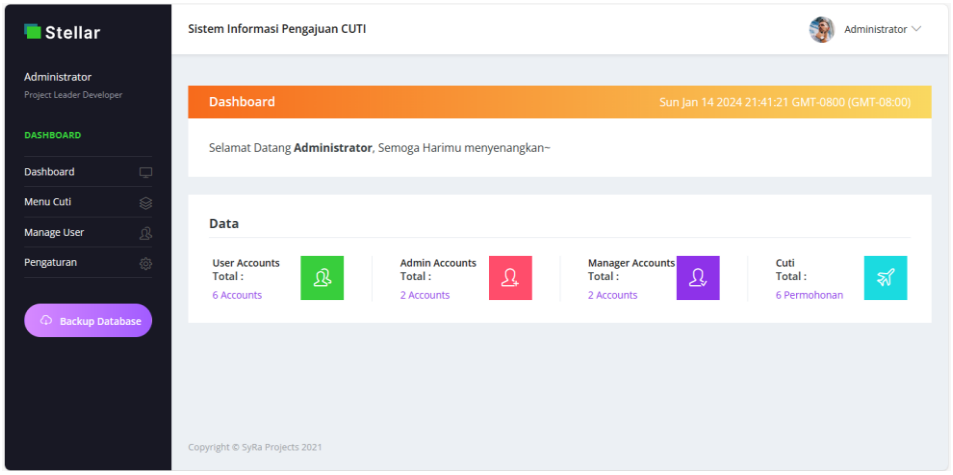

Figure 8. Admin Page Display

4.3 Manager User Page

On the Manage User Page, Admin can add new users to the system via a registration form that asks for necessary information such as name, email address, and password.

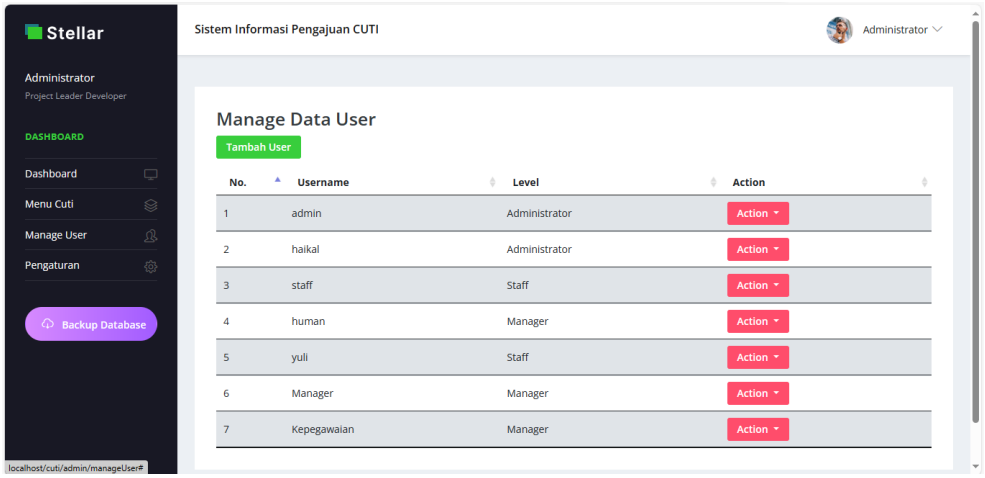

Figure 9. Admin Manage User View

Table 2. Table Description Manage User Data

Actor	Description
Admin	Admin adds new users into the system which is done through a registration form that asks for necessary information such as name, email address, and password.

4.4 Employee Page View

The employee page display contains a dashboard, and a Leave Menu. It can be seen in the Figure 10.

Table 3. Table Description Manage Access Rights

Actor	Description
Admin	Admins determine access rights and permissions for each user based on their role or responsibilities.

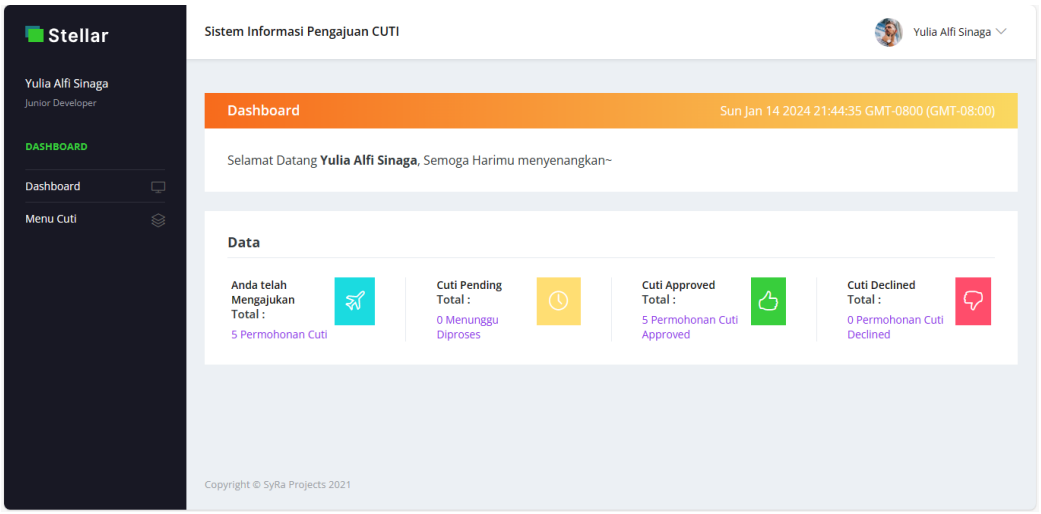

Figure 10. Employee Page View

4.5 Employee Leave Application Page

The Employee Leave Submission page contains a history of employee leave that has been previously submitted.

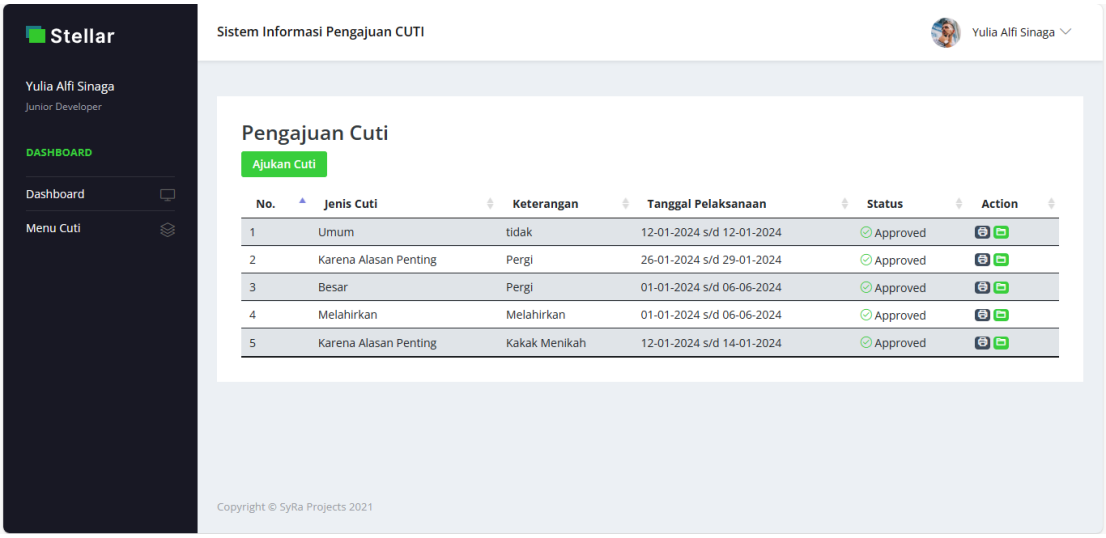

Figure 11. Employee Leave Submission View

Table 4. Table Description Manage leave data

Actor	Description
Admin	Admin accepts leave applications submitted by employees through the system.

4.6 Employee Leave Application Form Display

Below is a display of the employee leave application form. Here the employee fills out the Leave Form, namely: Type of Leave, Leave Description, Initial Leave Date and Final Leave Date. After filling out the form, the employee just has to wait for approval from the leader.

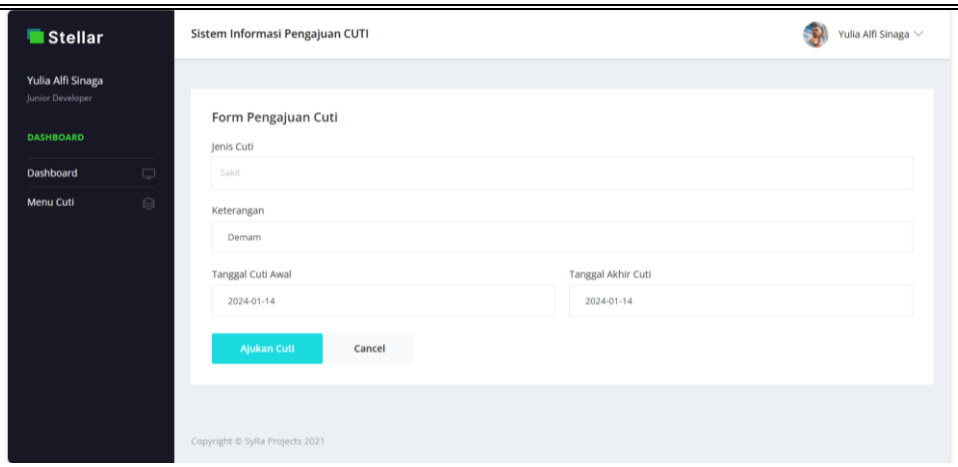

Figure 12. Employee Leave Request Form Description Table

Figure 13. Display of Employee Leave Application Form

Actor	Description
Head of Personnel Sub-Section	The Head of Personnel Sub-Division carries out the leave approval process by looking at employee leave application data and then considering whether this application will be *approved* or not.

4.7 Employee Leave Application

Below you can see the employee leave application page that has been inputted and is just waiting for approval.

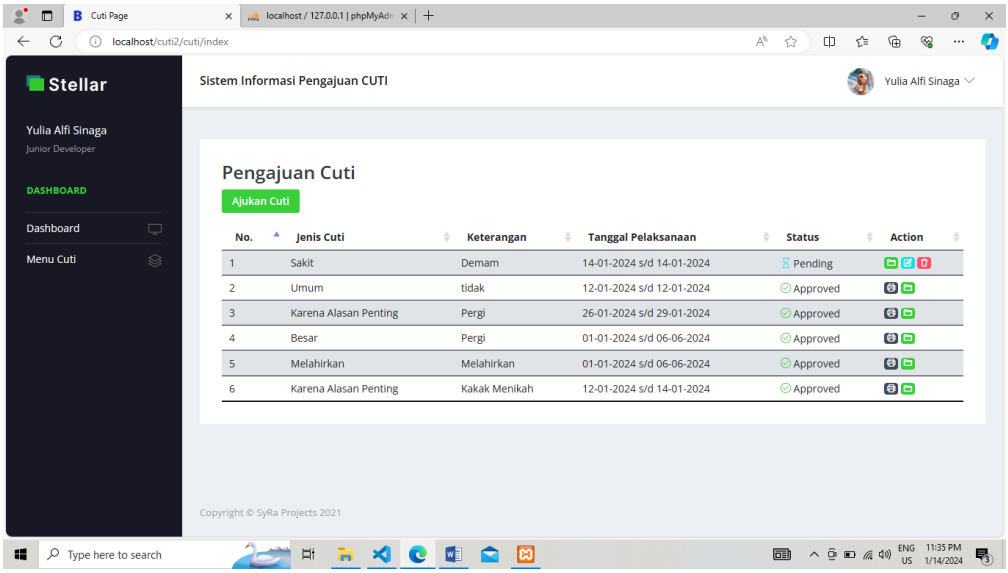

Figure 14. Display of Leave Pending Approval Application

Table 5. Leave Application History Table Description

Actor	Description
Employees	This history displays various information related to each leave application, including application date, leave type, leave duration, leave approval status.

4.8 Head of Personal Sub-Section Page View

The Head of Personnel Sub-Section page display contains a dashboard and a Leave Menu. It can be seen in the image below. On the dashboard menu, you can see employee leave data and pending leave, namely employee leave awaiting approval.

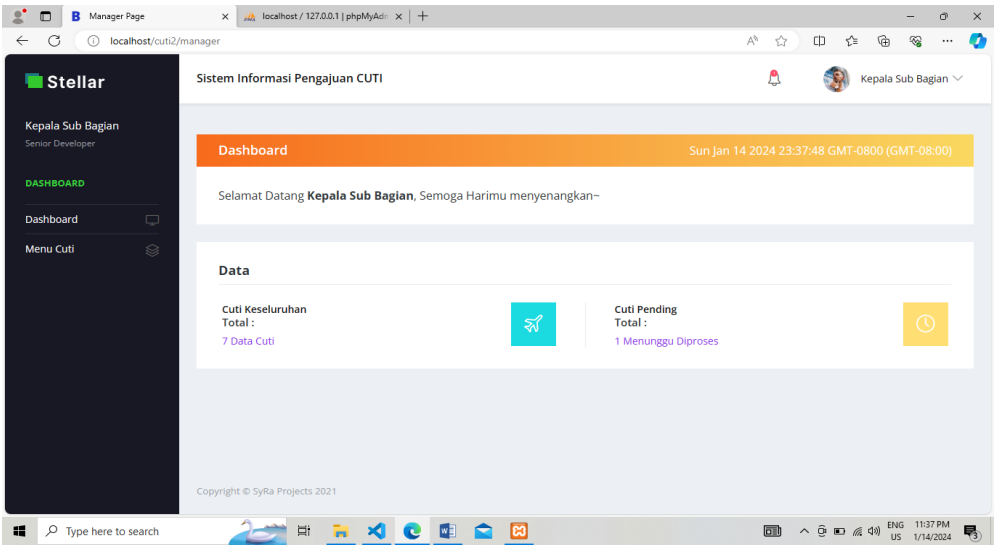

Figure 15. Personnel Subdivision Page View

4.9 Employee Leave Approved Form View

It can be seen below the form for changing employee leave applications. Here you will change the employee's leave status to approved. In this way, the employee's leave application has been approved.

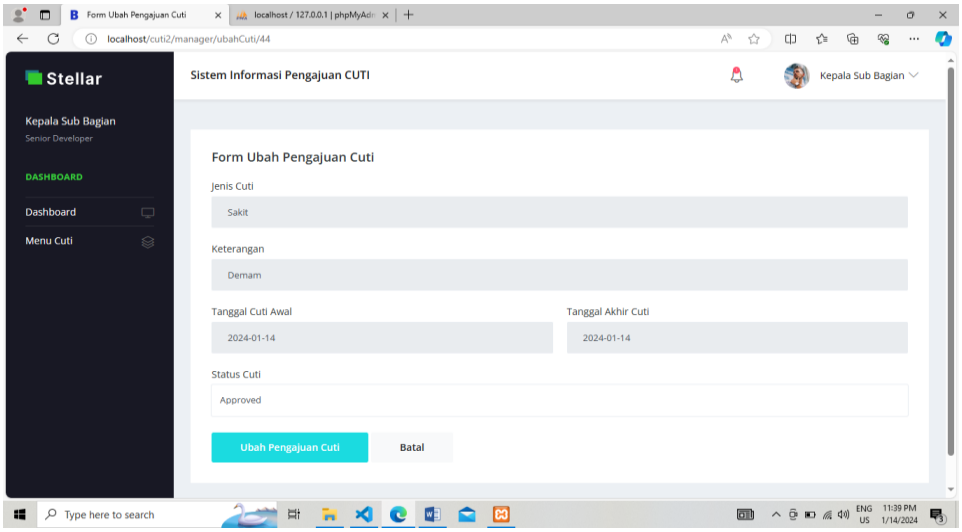

Figure 16. Display of Employee Leave Approved Form

4.10 Employee Approved Leave View

Below is the data on employee leave applications that have been approved. Then the status of the leave application for employees will change from pending to Approved or approved and the letter can be printed.

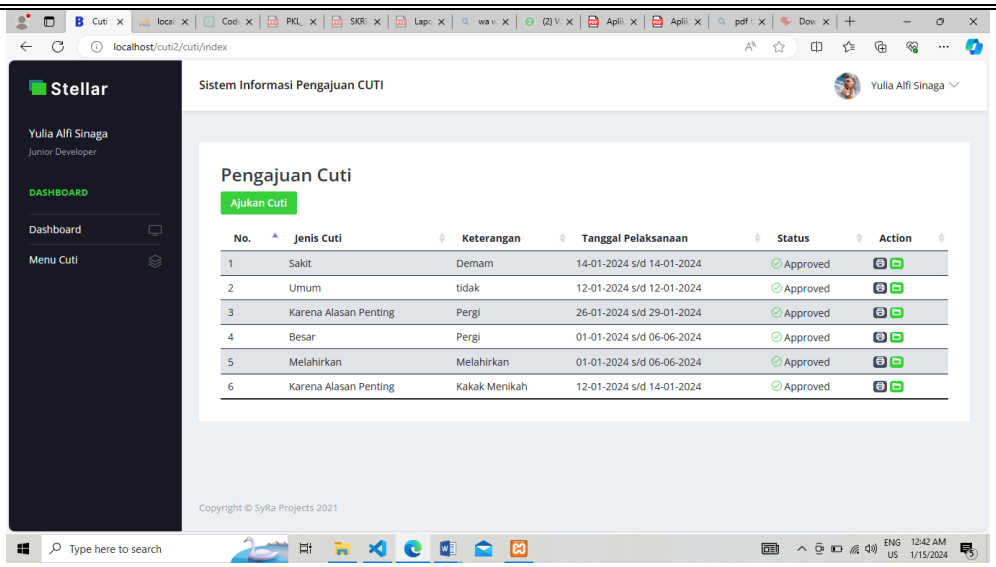

Figure 17. Display of Approved Employee Leave

Table 6. Description of the Leave Recapitulation Report Table

Actor	Description
Admin, Staff and Head of Personnel Sub-Division	The actor selects when to print a report that summarizes important information related to employee leave requests covering a specific time range, such as a month or year, and provides an overview of how leave was used by employees.

4.11 Table Structure

A database can be easily described as a collection of tables that are interrelated and form a specific purpose. The database created by the author to accommodate the relational tables is, leave table, division table, position table, leave_type table, level table, user table, and user_profile table.

#	Nama	Jenis	Penyortiran	Atribut	Tak Ternilai	Bawaan	Komentar	Ekstra
1	id	int(11)			Tidak	*Tidak ada*		AUTO_INCREMENT
2	id_nip	varchar(30)	latin1_swedish_ci		Tidak	*Tidak ada*		
3	id_jenis_cuti	int(11)			Tidak	*Tidak ada*		
4	tgl_pengajuan	timestamp			Tidak	current_timestamp()		
5	keterangan	varchar(64)	latin1_swedish_ci		Tidak	*Tidak ada*		
6	tgl_awal	date			Tidak	*Tidak ada*		
7	tgl_akhir	date			Tidak	*Tidak ada*		
8	status	varchar(30)	latin1_swedish_ci		Tidak	Pending		
9	edited_by	varchar(30)	latin1_swedish_ci		Tidak	*Tidak ada*		

Figure 18. Leave Database

Table 7. Leave Database Table Description

Database Categories	Description
Leave Database	This table is designed to store information about employee leave applications. Each row in the table represents a complete leave application

Database Categories	Description
	with details such as application date, leave type, status, etc.

#	Nama	Jenis	Penyortiran	Atribut	Tak Ternilai	Bawaan	Komentar	Ekstra
1	id	int(11)			Tidak	*Tidak ada*		AUTO_INCREMENT
2	divisi	varchar(30)	latin1_swedish_ci		Tidak	*Tidak ada*		

Figure 19. Division Database

Table 8. Division Database Table Description

Database Categories	Description
Division Database	This table is used to manage information about the organization. This table allows you to see the list of existing divisions.

#	Nama	Jenis	Penyortiran	Atribut	Tak Ternilai	Bawaan	Komentar	Ekstra	Tindakan
1	id_divisi	int(11)			Tidak	*Tidak ada*			Ubah Hapus
2	id	int(11)			Tidak	*Tidak ada*		AUTO_INCREMENT	Ubah Hapus
3	jabatan	varchar(30)	latin1_swedish_ci		Tidak	*Tidak ada*			Ubah Hapus

Figure 20. Department Database

Table 9. Department Database Table Description

Database Categories	Description
Department Database	The Departmen Table is used to store text data that describes a person's job title or position in an organization. The maximum length of text that can be stored is 30 characters.

#	Nama	Jenis	Penyortiran	Atribut	Tak Ternilai	Bawaan	Komentar	Ekstra	Tindakan
1	id	int(11)			Tidak	*Tidak ada*		AUTO_INCREMENT	Ubah Hapus
2	jenis_cuti	varchar(64)	utf8mb4_general_ci		Ya	*NULL*			Ubah Hapus
3	value	int(11)			Ya	*NULL*			Ubah Hapus

Figure 21. Leave Request Type Database

Table 10. Leave Type Database Description Table

Database Categories	Description
Leave Request Type Database	This table stores basic information about the different types of leave available.

#	Nama	Jenis	Penyortiran	Atribut	Tak Ternilai	Bawaan	Komentar	Ekstra	Tindakan
1	id	int(11)			Tidak	*Tidak ada*		AUTO_INCREMENT	Ubah Hapus
2	level	varchar(30)	latin1_swedish_ci		Tidak	*Tidak ada*			Ubah Hapus

Figure 22. Database Level

Table 11. Database level Description Table

Database Categories	Description
Database Level	This table is used to store data that has two main attributes: unique ID and level.

#	Nama	Jenis	Penyortiran	Atribut	Tak Ternilai	Bawaan	Komentar	Ekstra	Tindakan
1	id	int(11)			Tidak	*Tidak ada*		AUTO_INCREMENT	Ubah Hapus
2	username	varchar(12)	latin1_swedish_ci		Tidak	*Tidak ada*			Ubah Hapus
3	password	varchar(64)	latin1_swedish_ci		Tidak	*Tidak ada*			Ubah Hapus
4	level	int(11)			Tidak	*Tidak ada*			Ubah Hapus

Figure 23. User Database

Table 12. Database User Description Table

Database Categories	Description
User Database	This table stores basic data about the user, such as identity, login credentials, and possibly access level.

#	Nama	Jenis	Penyortiran	Atribut	Tak Ternilai	Bawaan	Komentar	Ekstra	Tindakan
1	id	int(11)			Tidak	*Tidak ada*			Ubah Hapus Lainnya
2	nip	varchar(30)	latin1_swedish_ci		Tidak	*Tidak ada*			Ubah Hapus Lainnya
3	nama	varchar(30)	latin1_swedish_ci		Tidak	*Tidak ada*			Ubah Hapus Lainnya
4	kelamin	varchar(16)	latin1_swedish_ci		Tidak	*Tidak ada*			Ubah Hapus Lainnya
5	divisi	int(11)			Tidak	*Tidak ada*			Ubah Hapus Lainnya
6	jabatan	int(11)			Tidak	*Tidak ada*			Ubah Hapus Lainnya
7	email	varchar(30)	latin1_swedish_ci		Tidak	*Tidak ada*			Ubah Hapus Lainnya
8	telp	varchar(30)	latin1_swedish_ci		Tidak	*Tidak ada*			Ubah Hapus Lainnya
9	tgl_masuk	date			Tidak	*Tidak ada*			Ubah Hapus Lainnya

Figure 24. Database User Profile

Table 13. Database User Profile

Database Categories	Description
Database User Profile	This table is used to store employee personal data, such as identity, contact, and employment information.

5. CONCLUSION

Based on the results of the design in creating a Web-Based Employee Leave Submission System at the DPMPTSP Medan, the following conclusions were drawn:

1. With the Web-Based Employee Leave Submission System at the DPMPTSP Medan, it will be more efficient. Leave submissions that usually take a long time and are a complicated process can now be done easily and quickly.
2. With this application, employees of the Web-Based Employee Leave Submission System at the DPMPTSP Medan can apply for leave from anywhere and at any time. In addition, leave approval does not have to wait for the Head of the Personnel Sub-Division to be there because leave application approval can be done anywhere.
3. With the Web-Based Employee DPMPTSP Medan, the risk of losing leave submission data will be reduced because it is neatly stored in the database safely.

The system built is expected to be an effective solution for employee leave management at the DPMPTSP Medan and can be further developed by adding other features such as automatic reports and real-time notifications.

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