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Design Violence Reporting System Households in Mataram City

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Abstract **Currently, cases of domestic violence are social and humanitarian problems that need attention. In 2020, the most dominant forms of domestic violence are psychological violence as much as 40%, sexual violence 26%, physical violence 22%, and economic 12%. The number of domestic violence cases in Indonesia also increased in 2019 from 1,419 cases to 2,389 cases in 2020. The increasing number of cases of domestic violence should be a serious concern for all parties. The Regional Technical Implementation Unit for the Protection of Women and Children (UPTD PPA) is a regional technical implementing unit formed by the regional government that can provide services for women and children who experience domestic violence, services, special protection, consultation, and others. The process of reporting domestic violence in Mataram City is still done conventionally, where people still need to visit the office to report incidents of domestic violence. Then the UPTD PPA will conduct a team discussion for the next action. From the current reporting process flow, the Mataram City UPTD PPA also still takes a long time to follow up on the domestic violence report. So there is still a lack of facilities and media that can assist the community in reporting domestic violence and assist the UPTD PPA in following up on reporting domestic violence. With the development of existing technology and the increasing number of people using android gadgets, from the problems above, researchers will design and build a Domestic Violence Reporting System in the City of Mataram to make it easier to report domestic violence directly without having to go to the authorities to handle the problem. The method that will be used for the development of this system is the Extreme Programming (XP) method.**

Keywords**: domestic violence, reporting system, Extreme Programming, UPTD PPA, Mataram City**

I. INTRODUCTION

Currently, cases of domestic violence are social and humanitarian problems that need attention. Victims of this case of violence are more dominant among women and children, so it is often referred to as gender-based violence [1]. Domestic Violence (KDRT) is an act against a person, especially a woman, resulting in physical, sexual, or psychological, including acts, coercion, or the robbery of independence against the law within the household [1]. In 2020, the most dominant forms of domestic violence are psychological violence as much as 40%, sexual violence 26%, physical violence 22%, and economic 12%. The number of domestic violence cases in Indonesia also increased in 2019 from 1,419 cases to 2,389 cases in 2020. The increasing number of cases of domestic violence should be a serious concern for all parties[2].

The Regional Technical Implementation Unit for the Protection of Women and Children (UPTD PPA) is a regional technical implementing unit formed by the regional government that can provide services for women and children who experience domestic violence, services, special protection, consultation, and others. Based on data from the PPA symphony in 2021, there were 1,172 cases of domestic violence in West Nusa Tenggara including 322 physical violence, 275 sexual violence, 187 psychological violence, 66 trafficking violence, 62 abuse or neglect, 10 exploitation violence, and 413 other violence. The process of reporting domestic violence in Mataram City is still done conventionally, where people still need to visit the office to report incidents of domestic violence. Then the UPTD PPA will conduct a team discussion for the next action. From the current reporting process flow, the Mataram City UPTD PPA also still takes a long time to follow up on the domestic violence report. So there is still a lack of facilities and media that can assist the community in reporting domestic violence and assist the UPTD PPA in following up on reporting domestic violence.

From the problems above, it is necessary to have information technology to make it easier for the public to report acts of Domestic Violence (KDRT) and facilitate UPTD PPA in handling cases of domestic violence. Therefore, this research was conducted to establish a system that can facilitate the community and the UPTD PPA. Where a hybrid-based domestic violence reporting system was developed, namely an Android-based mobile platform used by the community and a website-based platform used by admins. This is because the mobile platform is easier to use by the public. After all, it can be accessed via mobile devices, while the admin side will use the website platform because the development process is simpler and requires a short time. In this system, users can make reports that will be handled by the UPTD PPA, can see the status of reporting notifications whether they are being processed or received, can conduct consultations via chat, and get information about education on domestic violence cases.

The method that will be used for the development of this system is the Extreme Programming (XP) method. The XP method interacts more with the client in the system development process, so it requires good communication between the developer and the client to minimize errors in the system being developed. In the case of this Final Project, the community, especially the victims of domestic violence, and the Mataram City UPTD as clients.

Based on this, the author will design and build an information system entitled "Design of a Domestic Violence Reporting System in Mataram City". It is hoped that after the creation of this system, it will be able to help the UPTD PPA of Mataram City in managing information data related to domestic violence reports and helping the community to make it easier to report domestic violence in the city of Mataram.

II. Literature Review

A. Domestic Violence (KDRT)

Domestic violence according to the PKDRT Law no. 23 of 2004 is any act against a person, especially a woman, which results in physical, sexual, psychological misery or suffering, and/or neglect of the household including threats to commit acts of coercion, or unlawful deprivation of liberty within the household scope[9].

B. Information System

The information system is a system made by humans, which consists of components within the organization to achieve a goal which is to present information. Information systems can also be defined as a set of elements that work to collect, process, store, and disseminate information to support decision-making, coordination, monitoring, analysis, and visualization in organizations.[12].

C. Website

A website can be defined as a collection of pages that are used to display information, text, still or moving images, animation, sound, and or a combination of all of them, both static and dynamic which form a series of interrelated buildings were each linked by web pages (hyperlinks). A website-based information system is an application that is made web-based, in which it has a database to manage certain data[13].

D. XAMPP

XAMPP is free software that supports multiple operating systems, which is a compilation of several programs. The function of XAMPP is as a stand-alone server (localhost), which consists of the Apache HTTP server program, MySQL database, and language translator written in the PHP and Perl programming languages[14].

E. PHP

PHP is a programming language for creating the web. Where commonly used to create dynamic web pages. PHP can be used on Windows, Mac OS, Linux, and other operating systems[15].

F. Apache

Apache is a web server name that is responsible for HTTP request-response and detailed information logging. In addition, Apache is also defined as a web server that is compact, modular, follows the HTTP protocol standard, and of course very popular. The main function of apache is that it can produce web pages that are correct according to those created by a web programmer, using PHP code[16].

G. Web Server

Web Server is a software on the server that functions to receive requests (requests) in the form of pages via HTTP or HTTPS from clients known as web browsers and send back (response) the results in the form of web pages which are generally in the form of HTML documents.[15].

H. MySQL

MySQL is a multithreaded (multi-user) SQL database management system software or DBMS. MySQL is an implementation of a relational database management system (RDBMS) which is distributed free of charge under the GPL (General Public License) license[15].

I. Visual Studio Code

Visual Studio Code (VS Code) is a lightweight and powerful text editor created by Microsoft for multiplatform operating systems, meaning that it is also available for Linux, Mac, and Windows versions[17].

J. User Acceptance Testing

User Acceptance Testing is a software testing technique carried out by end-users where the user is a company employee who directly interacts with the system and verified whether the existing functions have been running according to needs.[18].

K. Bootstrap

Bootstrap is a popular HTML, CSS, and JavaScript framework for developing responsive and mobile-friendly websites. Bootstrap consists of a single CSS, JavaScript, and JQuery file [19].

L. API

Application Programming Interface (API) is documentation consisting of interfaces, functions, classes, structures, and so on to build software. With this API, it makes it easier for programmers to "disassemble" software, so then it can be developed or integrated with other software[20].

M. Android

Android is an operating system on mobile phones that is open and based on the Linux operating system. Android provides an open platform for developers to create applications that will be used for various mobile devices[21].

N. Flutter

Flutter is a mobile App SDK (Software Development Kit) for building Android and iOS applications from a high-performance codebase. The goal is to enable developers to deliver high-performance applications that feel natural on different platforms. Flutter is made using C, C++, Skia, and Dart languages.

O. Extreme Programming

Extreme Programming (XP) is an approach that focuses on coding which is the main activity at all stages or cycles of system development. XP is intended for small and medium-sized teams, team sizes are limited to between three and a maximum of twenty project members, and pair programming (two programmers coding on one computer) is characteristic of XP[24].

P. Laravel

Laravel is an open-source and free PHP-based web framework. Laravel is also intended for web application development using the MVC template. In Laravel, there is routing that bridges requests from users and controllers. So that the controller does not immediately accept the request.

III. METHOD

This study uses the Extreme Programming system development methodology which consists of 4 stages, namely: planning, design, coding, and testing. In Fig. 1 are the stages of system development which are illustrated in the research flow diagram.

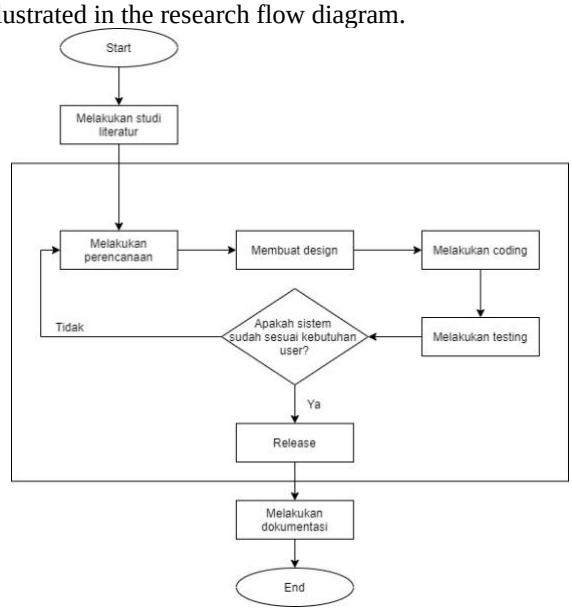

Fig. 1. Extreme programming research flowchart

The process for reporting acts of domestic violence at the UPTD PPA Mataram City can be seen in Fig. 2. Fig. 2 is the process of reporting acts of violence in the UPTD PPA Mataram City which has been carried out by victims or people who have seen acts of violence where the complainant comes to the office to report the incident. Then when the UPTD PPA receives the reporting report, the UPTD PPA will provide the reporting form sheet to the reporter to fill out. After the complainant has completed filling out the form, the UPTD PPA will conduct a team discussion on the next action to be taken.

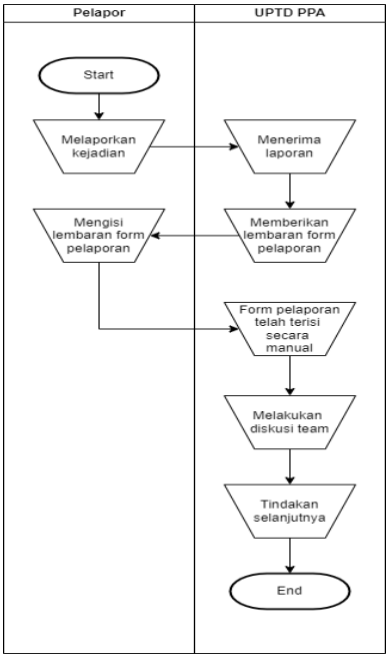

Fig. 2. Flow map diagram of the current system

A. Planning

At this stage, an analysis of the needs in system development will be made in the form of information data including the development of domestic violence cases from 2019 to 2021, data that will be filled in by the reporter when reporting, as well as planning to get an overview of the features and functions of the software. to be built. This system is intended for the general public who want to report acts of domestic violence and the UPTD PPA Mataram City as admin in managing the data. The system in this application can also provide information related to domestic violence news. In this final project, the author determines the requirements written in the form of a user story and uses several methods in gathering requirements, namely through interviews and direct observation.

A.1 User stories

At this stage, the user can determine the requirements written in the form of a user story. User stories can be divided into three parts, namely title, description, and acceptance criteria[28]. User stories are grouped based on application users in general or in more detail based on their needs. Application users are the general public who need to log in to be able to access the system and the UPTD PPA Mataram City as admin, who must log in to be able to access and manage data on the system. In this final project, it is planned that the program implementation can be completed within 40 active working days. Active working days here include weekdays. The time it takes to complete each iteration is called the velocity. The velocity value must be the same as the number of story points for each user story. The velocity value can also be determined by estimating the velocity value itself. The velocity value is determined by

the developer[29]. So the velocity value used in this final project is 10.

A.2 Iteration plan

The iteration plan is the process of determining which user stories will be implemented in each iteration. The iteration plan is divided into two, namely planning story estimates and dividing iterations for each story. In this final project, there are 30 story points and the velocity value is 10, so it can be seen that the number of iterations is 40/10 = 4 iterations. Each iteration in making the system in this Final Project research can be completed within 10 days. The iteration division and story allocation can be seen in Table I.

TABLE I. DISTRIBUTION OF STORY ITERATIONS

No	Kode US	Deskripsi	Estimasi (hari)
Iteration – 1			
1	US-01	*Login* ke dalam sistem dan mengakhiri sistem	4
2	US-10	*Sign up*	6
Velocity			10
Iteration – 2			
1	US-08	Melakukan konsultasi via *chat*	8
2	US-02	Melakukan pelaporan	2
Velocity			10
Iteration – 3			
1	US-09	Mengelola status pelaporan	4
2	US-07	Melihat grafik total pelaporan	4
3	US-11	Melihat *history* laporan	2
Velocity			10
Iteration – 4			
1	US-03	Melihat data pelaporan saksi mata dan korban	2
2	US-04	Mencari data pelaporan saksi mata dan korban	2
3	US-05	Mengelola pengaturan	2
4	US-06	Mengelola data *user*	2
5	US-12	Melihat informasi tentang kasus KDRT	2
Velocity			10

In Table 1 the velocity value is determined to be 10 so that in one iteration the developer can work on 10 story points which are completed within 40 days. One iteration contains the title of each user story according to the order of priority of the user story that has been determined. Based on Table 1, it is known that there are 40 user story points, so it takes 4 iterations to complete all user stories.

B. Design

System design is the design stage of how the developed system will work. In this final project, the system is designed with an object-oriented concept using UML to determine the interaction between objects in the system.

B.1 Use case diagram

Fig. 3 is a use case diagram of the Domestic Violence Reporting System in Mataram City.

Fig. 1. Use case diagram

B.2 Class diagram

In building this information system and application, a framework with the Model View Controller (MVC) architectural pattern is applied, so that the existing classes are designed, namely view, controller, and model. With the use of MVC, it is possible to separate the application logic and presentation layers. Fig. 4 and Fig. 5 are class diagrams that will be implemented using the MVC architecture.

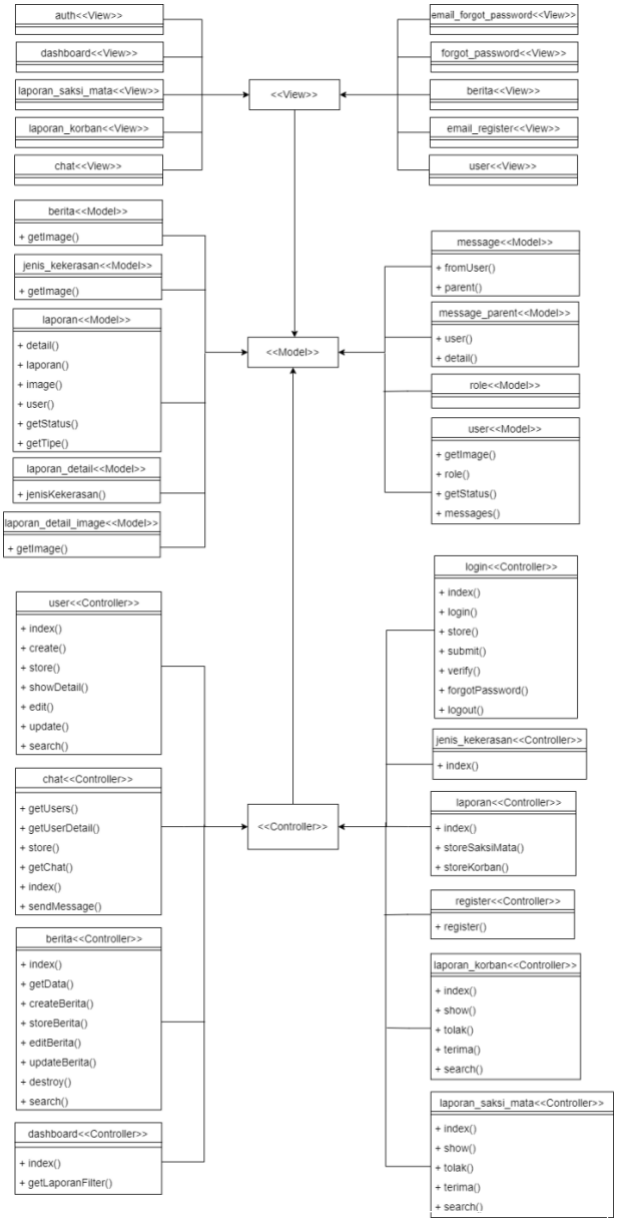

Fig. 4. Class diagram of the domestic violence reporting system on the website

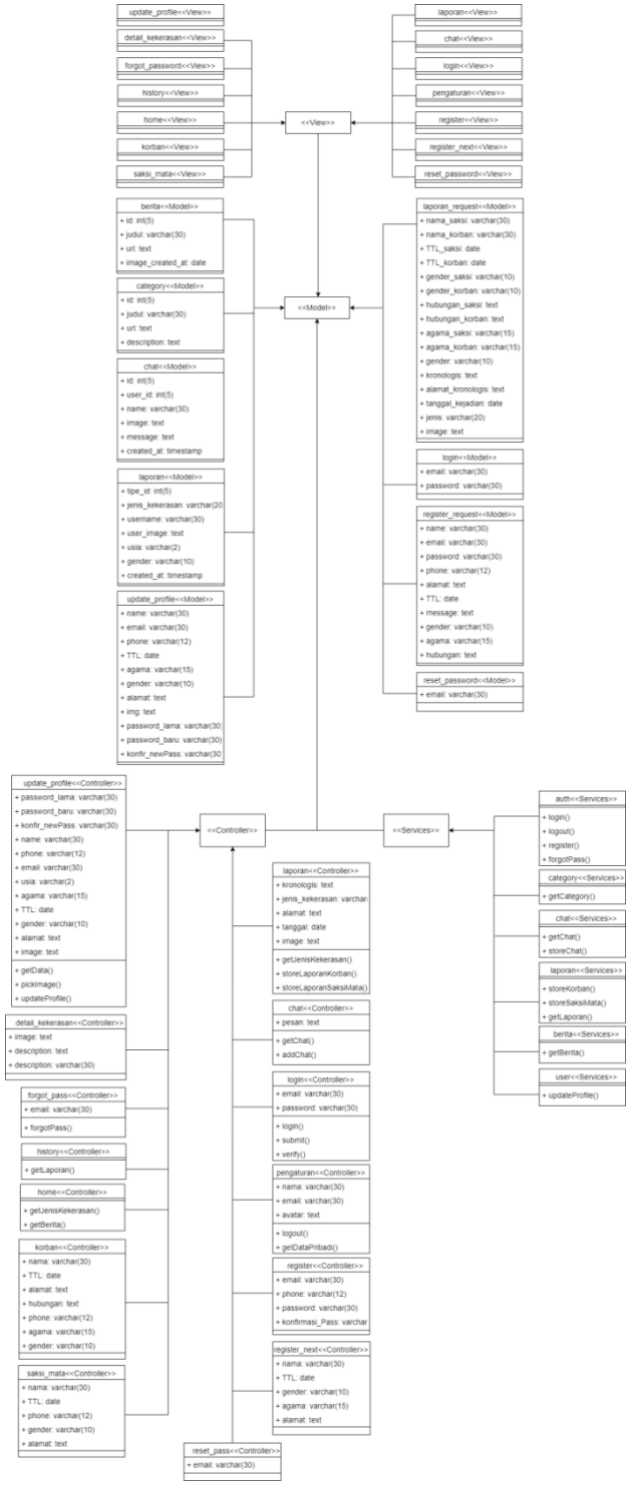

Fig. 5. Class diagram of the domestic violence reporting system on android

B.3 Database Design

The following is the Entity Relationship Diagram (ERD) of the Domestic Violence Reporting System in the City of Mataram, which can be seen in Fig. 6:

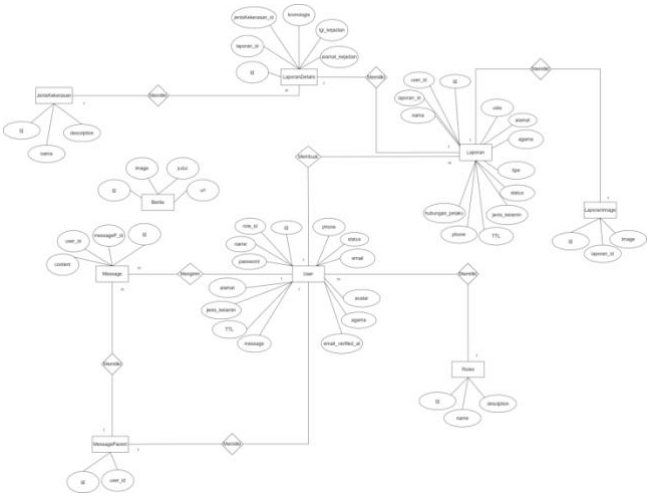

Fig. 6. Entity Relationship Diagram

B.4 System Architecture Design

The following is the system architecture design of the Domestic Violence Reporting System in the City of Mataram which can be seen in Fig. 7. as follows:

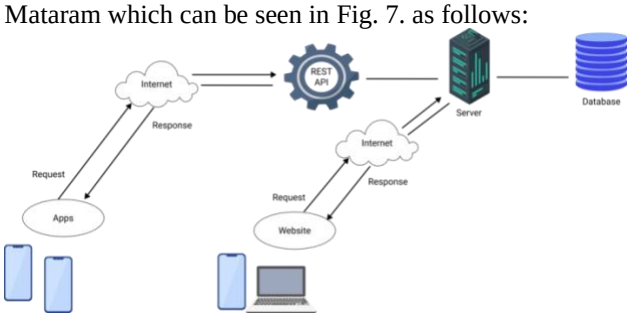

Fig. 7. The architectural design of the domestic violence reporting system

Fig 7 shows the architectural design of the domestic violence reporting system that will be developed. Based on the application, it can only be accessed via Android and used by users, where the application sends requests via the internet network on available API services. Once connected, the server will access the database and respond. And based on the website it can be accessed via multi-device and used by admins, where devices that access the system will send requests via the internet network and will directly connect to the server. Then when it is connected, it will access the database and respond in the form of HTML.

C. Coding

After the application design stage and general descriptions of the design for the system requirements to be built have been carried out, the next stage is the process of implementing the system design that has been carried out in the form of an application system. The coding process in making the system is carried out by the author himself with applications that are built based on Hybrid, namely Android and websites. Making the application to be built requires tools in the form of the laravel framework and android studio to implement the coding of the application system to be built.

The next stage is configuring the application system created with the database to be applied, namely MySQL.

D. Testing

After the system is complete, the next step is to test the system. System testing is done using User Acceptance Testing. This test aims to find out whether the system created has met the needs of the user or not. Software testing is carried out by the UPTD PPA before the product is tested by the user, to fix problems that will arise and improve the usability of the product. Then testing is also carried out by the community in providing feedback on the shortcomings or advantages of the product to improve product quality later by distributing questionnaires to several users.

E. Release

After carrying out the existing stages, the final stage will be carried out which will be implementing the system in everyday life. This study is limited only to the testing stage.

IV. Design and Result

A. System Implementation

In the process of developing this domestic violence reporting system using extreme programming methods such as the flow chart previously described in Fig. 1 to determine whether the system development has achieved the client's desired results or not. The discussion described in this sub-chapter is by the flow of the extreme programming method which consists of planning, design, coding, and testing.

A.1 Planning

In the previous planning stage, the developer discussed with the client to get user stories which in the case of this final project research the UPTD PPA Mataram City as the client. The purpose of this user story is to get an idea of how the system created can run. User stories that have been described in Table 1 obtained 12 user stories.

At this stage, the developer and client have held discussions about determining the iteration of the user stories to be worked on first. Where there are 4 iterations and each iteration is done for 10 days. So that the overall system plan will be carried out for 40 days. The details of determining the iteration can be seen in Table II.

TABLE II. Results of Story Iteration Planning

No	Kode US	Deskripsi	Estimasi (hari)
Iteration – 1			
1	US-01	*Login* ke dalam sistem dan mengakhiri sistem	4
2	US-10	*Sign up*	6
Velocity			10
Iteration – 2			
1	US-08	Melakukan konsultasi via *chat*	8
2	US-02	Melakukan pelaporan	2

Velocity			10
Iteration – 3			
1	US-09	Mengelola status pelaporan	4
2	US-07	Melihat grafik total pelaporan	4
3	US-11	Melihat *history* laporan	2
Velocity			10
Iteration – 4			
1	US-13	Mengunduh data pelaporan	10
Velocity			10
Iteration – 5			
1	US-03	Melihat data pelaporan saksi mata dan korban	2
2	US-04	Mencari data pelaporan saksi mata dan korban	2
3	US-05	Mengelola pengaturan	2
4	US-06	Mengelola data *user*	2
5	US-12	Melihat informasi tentang kasus KDRT	2
Velocity			10

There is 1 additional iteration, and each iteration is carried out for 10 days, so the planned system processing time is increased to 50 days.

B. Database Implementation

The following is a database implementation of the Domestic Violence Reporting System which can be seen in Fig. 8.

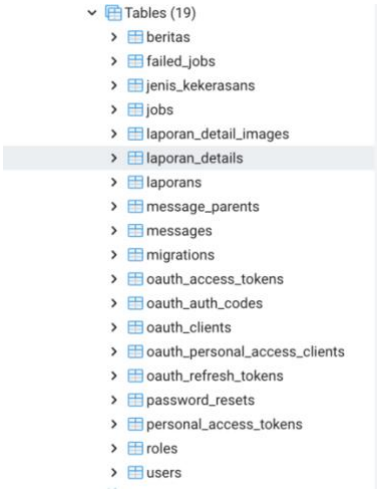

Fig. 8. Database implementation

Fig 8. is a database implementation of the domestic violence reporting system, where there are 9 tables, namely news, types of violence, reports_detail_images, reports_details, reports, message_parents, messages, roles, and users. While the other 10 tables are the default tables of the Laravel framework.

C. Class Implementation

In the implementation of this class, some classes are made to implement the system according to the design that has been done, which uses the PHP programming language and uses the Laravel framework.

D. Interface Implemenntation

The following is a display of the user interface design for the community and admin.

Fig. 9. The main page of the domestic violence system

Fig. 9 is the main page interface display when the user has logged into the system. On the main page, several navigations can be used by users such as the homepage, reports, consultations, and settings.

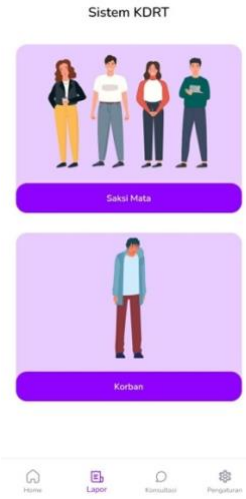

Fig. 10. Report page

Fig. 10 is a report page interface display that can be used to report domestic violence that is currently happening or being seen.

Fig. 11. Consultation page

Fig. 11 shows the interface for the consultation page that will be accessed by the user. This consultation page can be used to consult with the admin if the user wants to know about domestic violence.

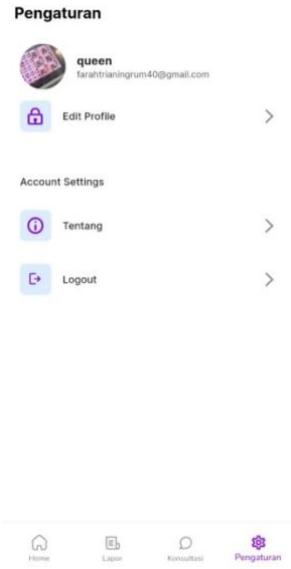

Fig. 12. Settings page

Fig. 12 is the user settings page interface display. Where on this page users can change personal data information, view information about UPTD PPA, and log out.

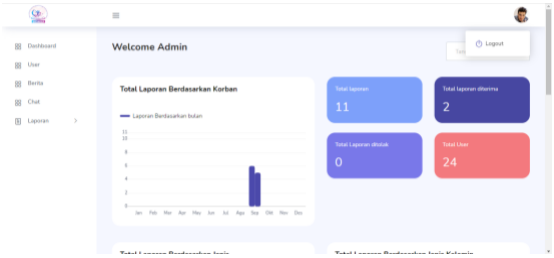

Fig. 13. Dashboard page

Fig. 13 is the dashboard page interface display when the admin has logged into the system. The dashboard page provides some information through graphs such as the total graph of incoming reports, the graph of total reports by type, the graph of total reporting by gender, and the graph of total reporting by age.

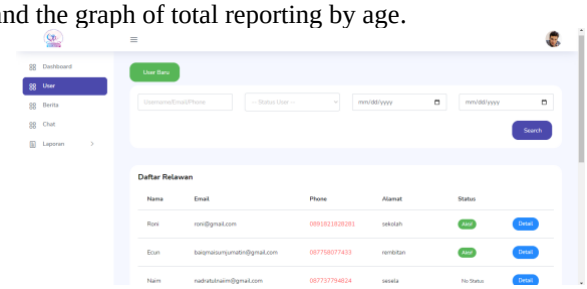

Fig. 14. User page

Fig. 14 is the user interface display page. Where on this page, admins can activate and deactivate user accounts, and admins can also add new users.

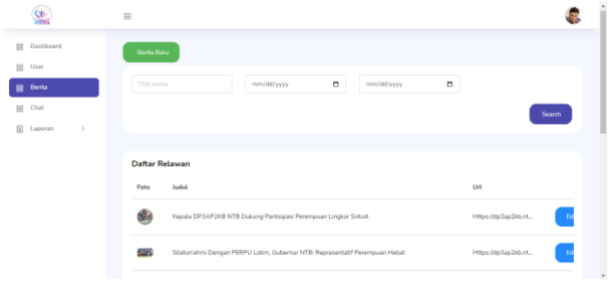

Fig. 15. News page

Fig. 15 is a news page interface display. Where on this page, the admin can add news that will be displayed on the android user view, edit news, and delete news.

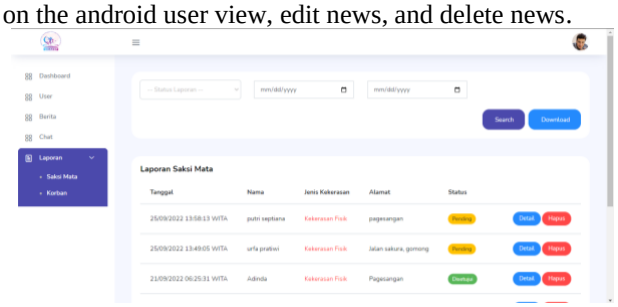

Fig. 16 Report page

Fig. 16 is the display interface of the report page. Where on this page, admins can manage incoming reporting data and can download reporting data in Microsoft to excel form based on the desired time.

E. Testing

In the previous chapter, the testing method that will be used in the application has been described, namely user acceptance testing. Where this testing is addressed to the UPTD PPA Mataram City to test the software that has been implemented to find whether there are errors in the system or not so that the system built can run according to user expectations. Testing aimed at the community is using the MOS approach by distributing questionnaires. The purpose of this test is to find out how the quality of the system built is based on the user's side. This testing process is carried out by showing how the system runs to the respondent, then the respondent will be asked to answer several questions based on the results of application testing that has been carried out.

E.1. MOS Test Results

After testing by giving questionnaires to respondents using a google form, then the results of the answers from respondents will be collected and calculated to get a conclusion on how feasible the system can be used. The questionnaire consists of 8 questions. The percentage of respondents' answers to the questionnaire, namely strongly agree, agree, moderate, disagree, and strongly disagree can be calculated as a whole and defined as the average value. The results of the user's answers to each question on the questionnaire are as follows:

1. Admin

The first thing the author does is explain some of the features that exist in the system that has been created. Then the UPTD PPA employees conducted a trial using

the system and filled out the questionnaire provided. Table 4 shows the results of questionnaire testing that has been conducted on 3 UPTD PPA employees, namely the head of the Mataram City UPTD PPA, namely Mrs. Eny Chaerany, the head witness for reporting, namely Mr. Herman, and the head witness for the follow-up, namely Mrs. Kurniati. So that the average result that answered strongly agree was 58.3%, agreed was 25%, enough was 16.7%, disagreed was 0%, and strongly disagreed was 0%.

TABLE 4. RESULTS OF QUESTIONNAIRE TESTING TO UPTD PPA

Pertanyaan	SS		S		C		TS		STS	
	Total	%	Total	%	Total	%	Total	%	Total	%
1	2	66,7	1	33,3	0	0	0	0	0	0
2	2	66,7	1	33,3	0	0	0	0	0	0
3	1	33,3	2	66,7	0	0	0	0	0	0
4	3	100	0	0	0	0	0	0	0	0
5	3	100	0	0	0	0	0	0	0	0
6	2	66,7	1	33,3	0	0	0	0	0	0
7	0	0	1	33,3	2	66,7	0	0	0	0
8	1	33,3	0	0	2	66,7	0	0	0	0
Rata-rata	58.3%		25%		16,7%		0%		0%	

2. Public

The first thing the author does is explain some of the features that exist in the system that has been created. Then the community was asked to do a trial using the system and fill out the questionnaire provided. Table 5 are the results of testing the questionnaire in several communities. So that the average result that answered strongly agree was 50.9%, agreed was 39.3%, enough was 7.6%, disagreed was 0.9%, and strongly disagreed was 1.3%.

TABLE V. RESULTS OF QUESTIONNAIRE TESTING FOR THE PUBLIC

Pertanyaan	SS		S		C		TS		STS	
	Total	%	Total	%	Total	%	Total	%	Total	%
1	12	42,9	12	42,9	3	10,7	0	0	1	3,6
2	13	46,4	13	46,4	1	3,6	1	3,6	0	0
3	13	46,4	11	39,3	3	10,7		0	1	3,6
4	15	53,6	10	35,7	2	7,1	1	3,6	0	0
5	16	57,1	10	35,7	1	3,6	0	0	1	3,6
6	14	50	10	35,7	4	14,3	0	0	0	0
7	16	57,1	11	39,3	1	3,6	0	0	0	0
8	15	53,6	11	39,3	2	7,1	0	0	0	0
Rata-rata	50,9%		39,3%		7,6%		0,9%		1,3%	

Fig. 17 and Fig. 18 are graphs of the average percentage of respondents who have used the android-based siCakep application and the website-based.

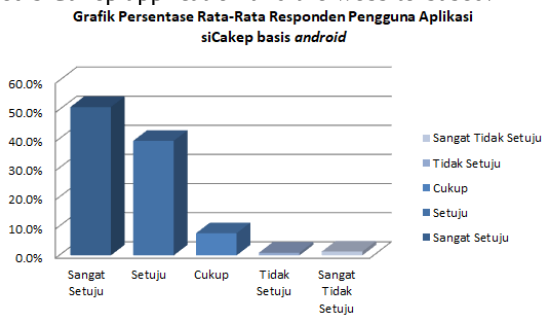

Fig. 17. Graph of the average percentage of respondents using the android-based siCakep application

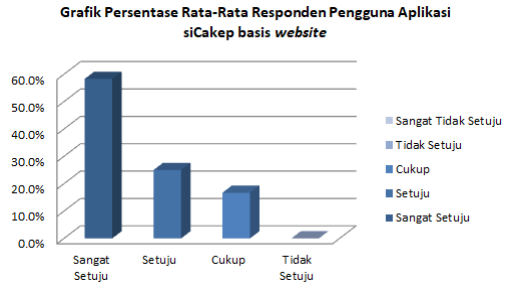

Fig. 18. Graph of the average percentage of respondents using the SiCakep application on a website basis

V. CONCLUSIONS AND SUGGESTION

A. *Conclusions*

Through rigorous system testing, the developed reporting system significantly streamlines domestic violence case reporting in Mataram City. Key features include a user-friendly reporting interface, chat-based consultations, and educational resources on domestic violence types. Results from the questionnaire reflect a positive public response, with 50.9% agreeing and 39.3% strongly agreeing.

The system also aids Mataram City UPTD PPA in efficiently managing domestic violence reports. Employee feedback indicates high satisfaction, with 58.3% strongly agreeing, 25% agreeing, and 16.7% finding the system satisfactory.

The choice of the Extreme Programming (XP) method is fitting, aligning with the collaborative approach in this Final Project. UPTD PPA's active client involvement during design and construction (Table 4.20) ensures the system functions as intended.

B. *Suggestions*

The suggestions given to make the system even better in the future are as follows:

1. In system development, it is hoped that this android-based application will not only be applied to the Mataram City area but can be applied throughout the province of NTB.
2. In system development, it is hoped that this android-based application can be made using two language features, namely English and Indonesian to facilitate users who are not from Indonesia.

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