Jurnal Sistematik
INSTITUT TEKNOLOGI GARUT

Jurnal Sistem Informasi, Teknologi Informasi dan Komunikasi
DOI: 10.33364/sistematik/v.1-1.2408

Design and Build a Web-Based Community Complaint Information System to Optimize the Distribution of Social Assistance (Case Study: Garut Regency Social Service)

Ayu Latifah [1], Nabila Aprilia Ramdhani[2]
[1,2]Department of Informatics, Institut Teknologi Garut, Indonesia

***email:** ayulatifah@itg.ac.id

Article Info
Submitted: May 1, 2025
Received: May 14, 2025
Published: May 31, 2025

Keywords:
Community Complaint System;
Rational Unified Process;
Social Assistance;
Unified Modeling Language;
Web.

ABSTRACT
The development of information technology has had a significant impact on various aspects of people's lives, including in Indonesia. In this context, the Garut Regency Social Service faces challenges in managing community complaints that are still carried out manually, resulting in slow responses to community complaints. The research aims to design and build a web-based public complaint system using the Rational Unified Process (RUP) method. Modeling for this system is carried out using the Unified Modeling Language (UML). This system is expected to speed up the complaint submission process and increase the responsiveness of the Social Service to public complaints. This research reveals that the system developed can increase the efficiency and effectiveness of handling public complaints. System testing shows that the system is easy to use and has a high level of user satisfaction. Thus, this system is expected to help optimize the distribution of social assistance through public complaints.

1. INTRODUCTION

The development of information technology has had a significant impact on various aspects of people's lives, including in Indonesia. This transformation has not only changed the way people work and communicate but also affected their interactions with government institutions [1]. The Social Service, as the government agency responsible for the implementation of activities in the social sector, is also affected by this development. The Head of the Social Service, who is directly responsible to the Regent, has the responsibility to ensure that the distribution of social assistance and the handling of social problems takes place effectively [2]. However, the process of managing community complaints at the Garut Regency Social Service is still carried out manually, which causes slow responses to community complaints. Currently, the community must submit complaints through the local RT/RW, which does not always guarantee that the complaints will be forwarded to the Social Service. In addition, complaint data collection is done manually using Microsoft Excel, indicating the lack of an integrated system that can speed up and simplify this process [3]. To overcome these problems, this study aims to design and build a web-based public complaint system using the Rational Unified Process (RUP) [4]. This system is expected to speed up the complaint submission process and increase the responsiveness of the Social Service to public complaints. Various previous studies have shown that a web-based complaint system can improve the efficiency and effectiveness of handling public complaints.

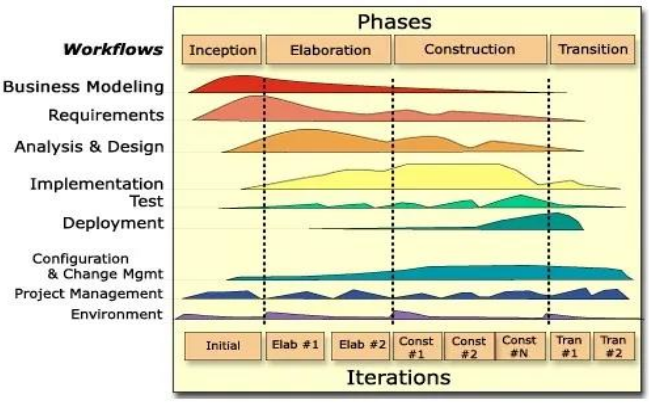
There are several other studies that are referenced in this study, including the first research conducted by [5] produce a web-based service complaint information system for SDIT Bina Insan Qur'ani using the Rational Unified Process (RUP), which makes it easier for parents and students to submit complaints in a structured and

accessible manner at any time. The second study conducted by [6] Produce a design of a website-based public complaint report information system, using the Rapid Application Development (RAD). This system provides significant benefits for institutions in improving the quality of public services and makes it easier for the public to convey their aspirations and complaints efficiently. The third research conducted by [7] Develop a community complaint website, which includes registration features, complaint services, complaint validation by officers, and reports. The method used in the development of this system is the Extreme Programming, which resulted in a community complaint system that assisted the community in submitting their complaints. The fourth research conducted by [8] produced a web-based public complaint system for the National Population and Family Planning Agency (BKKBN) of Kendari City using the prototype method. This system has a login, create and view report status feature for users, as well as a login, receive, review, and take action on report feature for admins. The fifth research conducted by [9] produce an online public complaint information system in Lubuklinggau City using the Systems Development Life Cycle (SDLC) with a waterfall approach. This system provides a login menu and a complaint page, which can be used by the public and related agencies to submit input.

Based on these problems, this study aims to design and build a web-based public complaint system using the Rational Unified Process (RUP) method. This system is expected to speed up the complaint submission process and increase the responsiveness of the Social Service to public complaints. With this system, it is hoped that it can help optimize the distribution of social assistance through public complaints.

2. RESEARCH METHODS

This study applies the Rational Unified Process (RUP) to develop software iteratively with a focus on design, as well as using Unified Modeling Language (UML) for its modeling [10]. RUP is a software engineering method developed through the integration of best practices in the software development industry. This method allows users to develop process models for software engineering, including visual modeling, programming, testing, and more [11]. The RUP consists of a series of processes that focus on software engineering and provide best practices and guidance for successful software development. Its main goal is to ensure the development of high-quality software that meets the needs of users while still adhering to a set schedule and budget [12][13]. The stages of this RUP methodology can be seen in Picture 1 below.

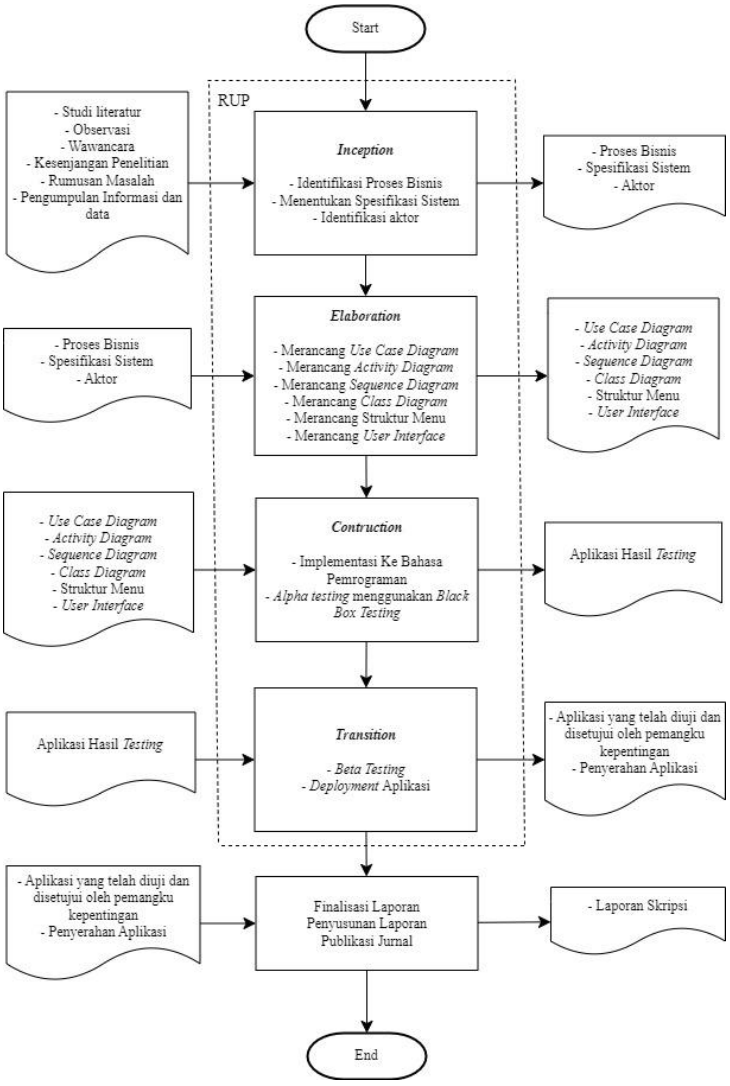


Picture 1. Stages of the RUP

The following is a description of the stages of the RUP methodology [14]that is:

1. Inception
   At this early stage, the main objective is to establish the vision of the final product and its business case, as well as clarify the scope of the project. It aims to create a clear understanding of the project's objectives.
2. Elaboration
   The second stage involves planning the necessary activities and resources, defining features, and designing the architecture in more detail. The focus is on developing an in-depth understanding of project execution and risk identification.

3. Construction
   The third stage is the implementation stage, where the components of the system are developed and tested. The focus is on the implementation of software application development according to the plan and architecture that has been set.
4. Transition
   The fourth stage aims to move the software product to the end user. After product implementation and delivery, issues that arise may require the development to release the latest version, fix issues, or resolve pending features Meanwhile, the description of the activities of this study can be seen in Picture 2 below.



Picture 2. Frame of Mind

The following is a description of each stage of the feasibility of this research.

1. Inception
   This step involves modelling business processes and determining application specifications based on observations, interviews, and literature studies. In addition, the identification of actors who will be involved in the system is also carried out.
2. Elaboration
   This step focuses on the analysis, design, and implementation of system structures into programming languages. Using UML as a modelling tool, including use case diagrams, activity diagrams, sequence diagrams, and class diagrams, as well as designing menu structures and user interfaces.
3. Construction

This step focuses on developing a community complaint system by writing program code until the system can be used. Alpha testing was carried out using the blackbox testing method to assess the suitability of the application to the needs.

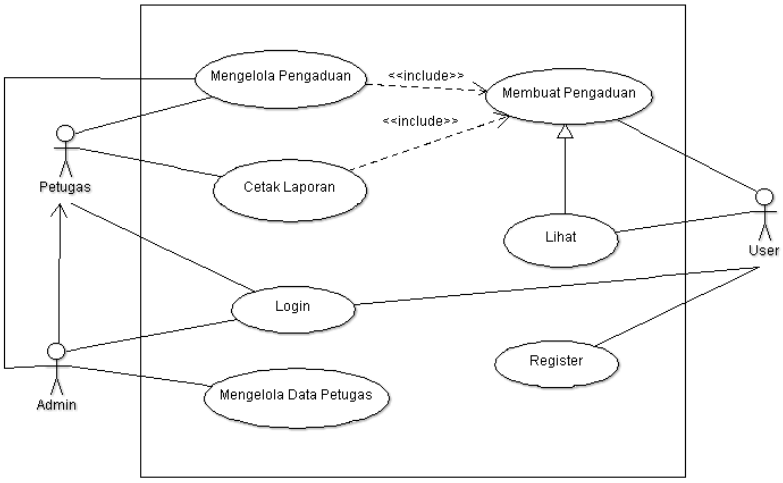
4. Transition
   This step involves handing over the system to the relevant agencies and beta testing directly to users through a questionnaire. The result of this stage is a system that has been tested, approved by stakeholders, and ready to be fully rolled out.

3. RESULTS AND DISCUSSION

In this section, the results of the research obtained are explained in detail, which can be expressed in the form of tables, program codes or graphs so that they are easy to understand.

3.1 Research Results

1. Inception
   In the inception stage, the focus of the activity is on business process modelling and determining system needs based on literature studies, observations, and interviews. Business process identification activities involve managing complaints, officers, categories, announcements, and printing reports. System specifications are determined in two categories, namely functional and non-functional specifications. The functional specification includes features for admins, officers, and users. Admins can login, manage complaints, categories, officers, announcements, and print reports, officers have similar features except to manage officer data and users can make complaints, view complaint lists, announcements, status and complaint responses. Non-functional specifications include software needs such as the use of PHP and Laravel, as well as hardware needs for developers and system users. The identification of actors in the system includes admins, officers, and users, with each having an activity.
2. Elaboration
   In this second step, the main focus is on the system architecture. Modelling is done using UML, which includes designing Use Case Diagram, Activity Diagram, Sequence Diagram and Diagram Class. UML is a visual modelling tool used to design and build object-oriented systems [15]. In addition to modelling, at this stage the design of the menu structure and User Interface to be used as an overview of the implementation into the programming language.



Picture 3. Use Case Diagram

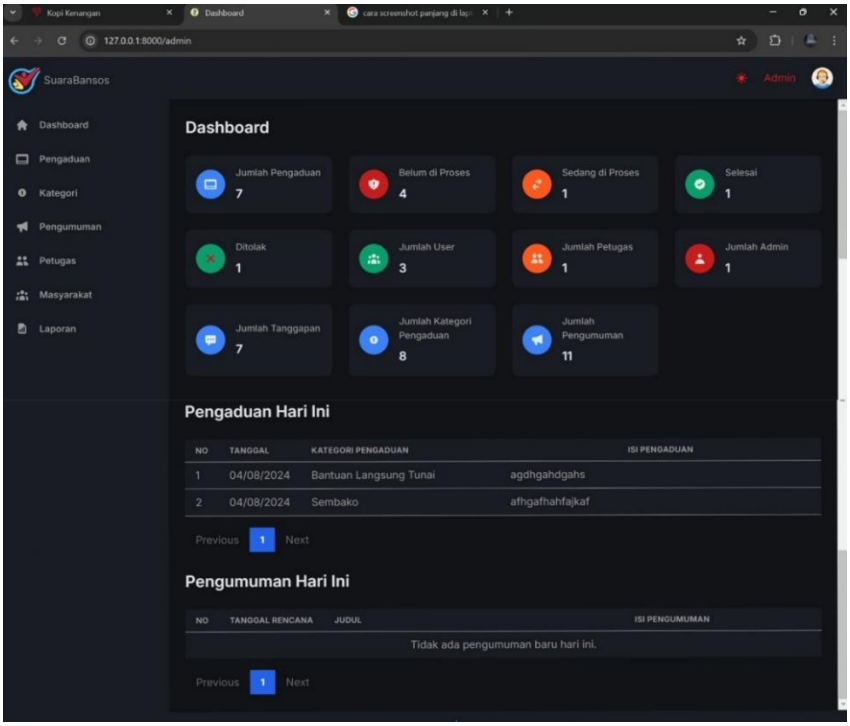
After designing the use case diagram, the next step is to design the interface or appearance of the website to be created, as shown in the following Picture 4.

Picture 4. Admin Dashboard Interface Design

Picture 4 is an image of the admin dashboard interface design, where admins can manage complaints, manage categories, manage announcements, manage officers, and manage reports.

3. Construction
   a. Implementation into programming

      During the implementation process, the system is built using the PHP programming language with Framework Laravel. Laravel is a web framework Open source Php-based designed for web application development by following architectural patterns model-view-controller (MVC) [16]. The results of the implementation of the interface design can be seen in Picture 5 below.



Picture 5. Admin Dashboard Page View

   b. Black-Box Testing

      At this stage, alpha testing is carried out using the Black Box method. This test aims to find bugs or errors in the system to ensure that the system functions as expected.

Table 1. Black Box Testing

Yes	Activity	Test Class	Test Scenarios	Expected Results	Information
1.	Login	Log in correctly	Enter the correct phone number and password	Successful login and login to the dashboard page	Appropriate
		Doing the wrong login	Enter the wrong phone number and password	Login failed and remains on the login page	Appropriate
2.	Forgot Password	Choosing to forget your password	Choosing to forget the password on the login page	Entering or linking a registered email will then have a password reset notification in the linked email	Appropriate
3.	Register	Fill out the register form correctly	Enter the data according to the register form	Register successfully and enter the main page	Appropriate
		Fill out the incorrect register form	Entering the wrong NIK or incorrect email in the register form	Failed or invalid register and remains in the register form	Appropriate
4.	Complaint	Filter complaint data by date	Choose a date from and a date until	Data that appears by date	Appropriate
		Filter complaint data by complaint category	Choose a complaint category	Data that appears by category	Appropriate
		Complaint process	The complaint details appear and the admin/officer responds and changes the status of the complaint	Complaint data that has been responded to, stored in the database	Appropriate
		See PDF	Open PDF file	View PDF file	Appropriate
		Print PDF	Print the details of the user complaint with the correct rules	User complaints are printed to PDF files	Appropriate
5.	Category	Add categories based on type	Add category data	Category data in the database is growing	Appropriate

Yes	Activity	Test Class	Test Scenarios	Expected Results	Information
		of social assistance			
		Edit category data	Edit category data	Category data updated	Appropriate
		Delete category data	Delete category data	Category data deleted	Appropriate
		Filter categories	Choose a complaint category	Data that appears by selected category	Appropriate
6.	Announcement	Add announcement	Add announcements	Announcement data in the database is growing	Appropriate
		Edit the announcement	Edit an announcement	Updated announcement data	Appropriate
		Delete an announcement	Delete an announcement	Deleted announcement data	Appropriate
		Search for announcements	Enter the title of the announcement	Show the search for announcements if any	Appropriate
7.	Officer	Add officer data	Add officer data	The data of officers in the database is growing	Appropriate
		Edit officer data	Edit officer data	Updated officer data	Appropriate
		Remove the officer	Remove an officer	Officer's data deleted	Appropriate
8.	Community	View community data	View community data	Data appears on people who have registered	Appropriate
9.	Report	Export to PDF	Print user complaint data with the correct rules	Complaint data is printed to PDF file	Appropriate
10.	Make a complaint	Choose a category	Choose a category according to the type of social assistance to be complained about	A complaint report form appears	Appropriate
		Complaint form	Fill out the report form	Pressing the report button, a successful	Appropriate

Yes	Activity	Test Class	Test Scenarios	Expected Results	Information
				notification appears and returns to the complaint category page	
11.	Complaint process	Complaint data	View the status and response of a complaint	The status and response to the complaint appear in accordance with the one that has been determined by the officer	Appropriate
12.	My Profile	Edit profile	Select the my profile menu then edit the profile	Display the updated form edit profile and user profile pages	Appropriate
13.	Logout	Log out	Select the sign-out button	Successful logout	Successful

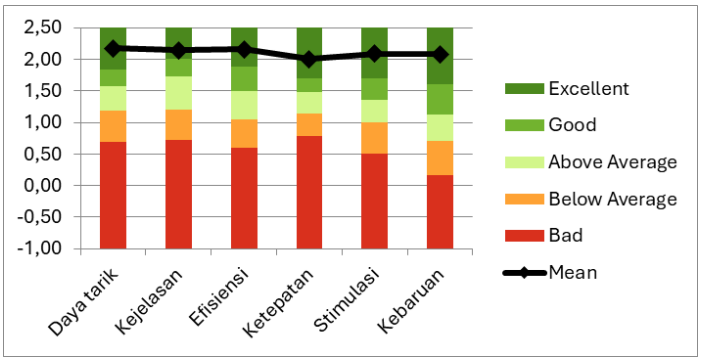
4. Transition
   a. Beta Testing

   This stage is a stage in which beta testing is carried out and then continued with the deployment or submission of the system to the agency. Beta testing done by utilizing User Experience Questionnaire (UEQ) [17] involving 38 respondents. Respondents consisted of 1 involving 38 participants. Participants consisted of 1 Admin, 7 officers, and 30 users (the community). After trying the system created, respondents were asked to fill out a questionnaire sent through Google Form. This questionnaire consists of 26 questions and has 7 options for answers. This questionnaire was used to evaluate their experience in using the system. After collecting answers from 38 participants, the 26 questions were grouped into 6 aspects. Once the calculation is done, the benchmark results are shown in the following Table 2.

Table 2. Benchmark Results

Scale	Mean	Comparison to benchmark	Interpretation
Attraction	2,17	Excellent	In the range of the 10% best results
Clarity	2,14	Excellent	In the range of the 10% best results
Efficiency	2,16	Excellent	In the range of the 10% best results
Accuracy	2,00	Excellent	In the range of the 10% best results
Stimulation	2,09	Excellent	In the range of the 10% best results
Novelty	2,08	Excellent	In the range of the 10% best results

The table shows that the average score for each component shows excellent quality as it is above ten percent of all data available on the market. In addition, the results of Table 11 can be accessed via the benchmark chart, as shown in the Picture below.



Picture 5. Admin Dashboard Page View

The graph shows an excellent average. Although the accuracy aspect has the lowest value, it is still in the "excellent" category. Although the developed app is already excellent, some aspects still need to be improved, such as accuracy and novelty, to improve the overall user experience.

b. Deployment

After conducting beta testing using UEQ, the results from the system users showed an excellent average rating, i.e. above the top 10% of all available data. After the system operates according to the needs of users, the final stage is implementation, where the system will be fully handed over to the Garut Regency Social Service to be used according to their needs.

3.2 Discussion

In this section, there is a harmony that is a comparison between the reference research and the research that is being conducted. The following is a comparison between the reference research and the research conducted:

1. On the first reference [5], there are problems regarding complaints that are still carried out manually and the system is operated by two actors. Meanwhile, in this study there are similar problems but with different case studies and also in this study there are three access rights.
2. In the second reference [6], a system built using the Rapid Application Development (RAD) and accommodates complaints in general. Meanwhile, in this study, the system was built using the Rational Unified Process (RUP) and focuses on complaints regarding social assistance.
3. In the third reference [7], the development of the system using the XP method and the community complaint system that was built did not have a report printing feature. Meanwhile, in this study, in its development, the Rational Unified Process (RUP) and there are Announcement so that the public can find out the latest information about social assistance.
4. In the fourth reference [8], a system built There is no feature to print complaint reports yet, while in this study a complaint report print feature is added which can make it easier for admins or officers to manage complaint reports.
5. On the fifth reference [9], the system built does not yet exist Complaint Status. While in this study Adding a complaint status feature so that the public can know the latest process.

4. CONCLUSION

This research succeeded in designing and building a web-based community complaint system using the Rational Unified Process (RUP) method for the Garut Regency Social Service. This system is able to speed up the complaint submission process and increase responsiveness to public complaints. Tests show that the system has a high level of efficiency and effectiveness and has received positive responses from users. This system not only makes it easier for the public to submit complaints, but also helps the Social Service in managing and responding to complaints in a faster and structured manner. With this system, it is hoped that the distribution of social assistance can be optimized through more organized community complaints. This research also makes an important contribution to the use of information technology for better public services.

REFERENCE

[1] A. Latifah, A. Deddy Supriatna, and I. Saputra, "Rancang Bangun Sistem Pengelolaan Ruangan Berbasis Website," J. Sist. Cerdas, vol. 5, no. 3, pp. 147–154, 2022, doi: 10.37396/jsc.v5i3.248.

[2] T. Hamdala and S. Esabella, "Rancang Bangun Aplikasi Monitoring dan Evaluasi Penyaluran Dana Sosial Di Dinas Sosial Kabupaten Sumbawa Berbasis Web," J. Inform. Teknol. dan Sains, vol. 2, no. 2, pp. 105–111, 2020.

[3] M. Badri and others, "Sistem Informasi Bantuan Sosial Di Kabupaten Landak Berbasis Web," J. Satya Inform., vol. 8, no. 02, pp. 93–103, 2023.

[4] S. S. Anggriani, W. A. Triyanto, and D. L. Fithri, "Sistem Informasi Pemberian Bantuan Sosial Di Dinas Sosial, Pemberdayaan Perempuan, Perlindungan Anak, Pengendalian Penduduk Dan Keluarga Berencana (P3Ap2Kb) Kabupaten Kudus Berbasis Web Menggunakan Notifikasi Sms," Indones. J. Technol. Informatics Sci., vol. 2, no. 1, pp. 22–26, 2020, doi: 10.24176/ijtis.v2i1.5645.

[5] A. Mulyani, Y. Septiana, and R. Alamsyah, "Rancang Bangun Sistem Informasi Pengaduan Layanan Menggunakan Metode Rational Unified Process," J. Algoritm., vol. 19, no. 2, pp. 722–728, 2022, doi: 10.33364/algoritma/v.19-2.1199.

[6] A. Ikhwan and D. A. P. Lubis, "Perancangan Sistem Informasi Laporan Pengaduan Masyarakat Berbasis WEB pada Dinas ESDM SUMUT," Hello World J. Ilmu Komput., vol. 2, no. 1, pp. 1–13, 2023, doi: 10.56211/helloworld.v2i1.193.

[7] H. Mayatopani, "Pengembangan Website Pengaduan Masyarakat Menggunakan Pendekatan Extreme Programming," J. Ilm. Sist. Inf. Akunt., vol. 3, no. 2, pp. 136–145, 2023.

[8] M. I. Prayogi, I. Puspita, and A. H. Wibowo, "Sistem Pengaduan Masyarakat Berbasis Website (SPM) Studi Kasus : Badan Kependudukan dan Keluarga Berencana Nasional (BKKBN) kota Kendari," Animator, vol. 1, no. 2, p. 57, 2023.

[9] S. Hamidani and E. Etriyanti, "Sistem Informasi Pengaduan Masyarakat Kota Lubuklinggau Berbasis Website," J. Ilm. Bin. STMIK Bina Nusant. Jaya Lubuklinggau, vol. 3, no. 2, pp. 61–67, 2021.

[10] Rosa and M. Shalahuddin, "Pdf-Buku-Rpl-Rosa-As-Amp-M-Salahuddin_Compress." p. 100, 2017.

[11] T. Suryana, "Metode RUP Rational Unified Process," Metod. RUP Ration. Unified Process, 2007.

[12] C. Péraire, M. Edwards, A. Fernandes, E. Mancin, and Kathy, Front cover The IBM Rational Unified Process. 2007.

[13] A. D. Supriatna, Y. Septiana, and T. A. Renaldi, "Rancang Bangun Sistem Informasi Keuangan pada Koperasi Pengayoman Intan Lapas Garut Berbasis Web," J. Algoritm., vol. 19, no. 2, pp. 738–746, 2022, doi: 10.33364/algoritma/v.19-2.1204.

[14] P. Kruchten, The Rational Unified Process: An Introduction. in Addison-Wesley object technology series. Addison-Wesley, 2004.

[15] A. R. Mahbub, K. Hantoro, and Y. Suyanih, "Analisa Dan Perancangan Layanan Pengaduan Masyarakat Desa Berbasis Web Dengan Pendekatan Uml," Fakt. Exacta, vol. 13, no. 1, pp. 26–34, 2020.

[16] Y. Yudhanto and H. A. Prasetyo, Mudah menguasai framework laravel. Elex Media Komputindo, 2019.

[17] M. Schrepp, "User Experience Questionnaire Handbook," URL https//www. Res. net/publication/303880829{_}User{_}Experience{_}Questionnaire{_}Handbook{_}Version{_}2.(Accessed 02.02. 2017), pp. 1–15, 2019.