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Designing Web-Based Mess and Dormitory Booking Applications

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ABSTRACT

Development of a web-based Mess and Dormitory Booking Application is an innovative step in increasing the efficiency and comfort of housing services for students. This application aims to replace the manual booking system with a web technology-based solution that makes it easier for students to access information and make reservations practically. The method used is waterfall, where the software development process is sequential which develops downwards like a waterfall and is a method suitable for use in system development whose specifications do not change and are systematic and sequential, so that each stage in the development process will begin when the previous stage has been completed. There are 5 stages in the waterfall method, namely analysis, design, implementation, testing, and maintenance, which allows users to easily check the availability, facilities, and rates for mess and dormitories in real-time. Through an integrated online booking system, students can make room reservations quickly, efficiently and hassle-free. The application of web technology is expected to reduce complexity in managing student housing, save time, and increase information transparency. The use of web-based Mess and Dormitory Booking Applications not only optimizes housing management, but also improves the student experience in finding housing that suits their preferences and needs. Thus, this application can make a positive contribution to the advancement of information technology in the academic environment and provide a modern solution for student housing needs.

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1. INTRODUCTION

Information technology has emerged with various advantages, for example data processing techniques that are so fast compared to manual work that processing large amounts of data is no longer an obstacle [1][2]. One way to deal with advances in technology and information is to study and make the best use of information technology [3]. The form of development of information technology is an information system that can produce information so that it is useful for the recipient [4]. One place that really needs information services is a university, but not all universities have complete information services [5]. As a means of information, websites have a very important role and are a tool for creating a faster and more current information system in the management and marketing of mess and dormitories [6][7].

The mess is a residence provided by universities for educators, teaching staff and the general public. Padang State University has a mess with a building consisting of many rooms. The building has several rooms with several beds [8]. Dormitories are residences provided by universities for their students. Padang Pesisir Selatan State University build a dormitory with a building consisting of many rooms. The building has several rooms with each bed. Data collection on students who occupy dormitories is carried out by the admin or dormitory administration staff [9].

Dormitory data processing does not yet use automatic data storage media (databases), which causes errors to often be found in recording payment reports between dormitory administration employees and bank slips owned by students, resulting in student data processing being delayed. Another problem that arises is the large amount of student data in the form of check-in forms and dormitory payment data in the form of bank slips which are piled up, making it difficult for administrative staff to make recapitulation reports, so it requires a high level of accuracy and a long time in searching for data and making reports to present the information to related parties [8]. Meanwhile, internal UNP parties who will book messes for seminars and training activities will also be more practical and efficient in the booking process without waiting for confirmation from administrative staff to check data manually [10].

The solution to this problem is the design of a responsive web-based application with a database as a data storage place. This solution can accommodate reporting according to the desired results, because all data will be stored in the database and speed up the work process to make it more effective and efficient or avoid wasting time and energy, making it easier to manage so that archives are maintained properly on a regular basis, so they are easy to find again. necessary archives, save archive storage space, and maintain confidentiality and preservation of archives [11].

Flexible access because it utilizes web-based services to allow users to manage orders from anywhere, at any time. Use Application Programming Interface (API) integration with

third-party services to improve functionality, such as integration with payment systems, or security services [2]. Design the application so that it can evolve over time, allowing for the addition of new features and capacity increases and providing guaranteed data security by implementing adequate encryption and privacy protection.

Based on the problems revealed, the author offers a solution to design a web-based application that functions as a medium for information about messes and dormitories in state universities. Reports that provide a comprehensive overview of the booking and use of mess and dormitory facilities, assisting management in planning. This information includes the initial cost of entering the dormitory and mess, monthly fees, dormitory and mess facilities, as well as the dormitory activity schedule [9]. The design of the WEB-based UNP PESSEL mess and dormitory booking application comes with a different appearance because it is prepared with digital services which have advantages such as being practical and easy to use. Apart from that, it is equipped with interesting and complete images, animations and videos..

2. RESEARCH METHOD

The type of research used is Research and Development (R&D) [12], where Research and Development (R&D) is a process to produce and test the effectiveness of certain products [13]. In this research, the development procedure uses the waterfall model, which is one of the approaches in the Software Development Life Cycle (SDLC) developed by Winston Royce [14]. The waterfall model is a sequential software development process that develops downward like a waterfall [15] and is a method suitable for use in system development whose specifications do not change [16] and is systematic and sequential, so that each stage in the development process will start when the previous stage has been completed [17]. By applying this model, it is suitable for software that has the aim of building a system from scratch by collecting system requirements that will be built according to needs [18]. In general, the stages in the model *waterfall* can be described as follows [19] :

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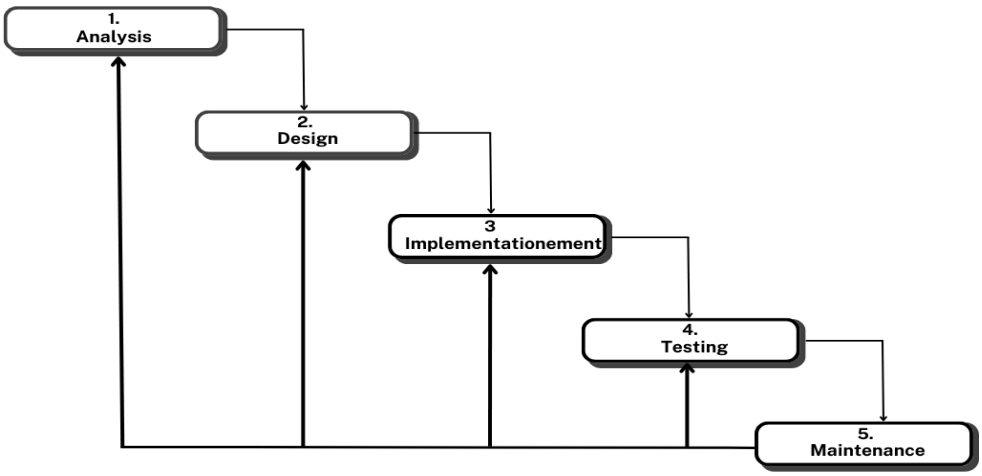

Figure 1. Metode Waterfall Winston Royce

The product developed is a web-based application, namely the development of a mess and dormitory booking application that integrates algorithm modeling or program flow through the Unified Modeling Language (UML). Data collection was carried out in two ways, namely field studies by conducting observations and interviews, and secondly through literature studies. The development of the mess and dormitory booking application was carried out only until the implementation stage due to time constraints and other reasons.

3. RESULTS AND DISCUSSION

3.1. Needs Analysis

The needs analysis carried out by researchers is divided into two types, namely functional needs analysis and hardware and software needs analysis [15].Functional requirements analysis is carried out to determine the software requirements and data required in the application booking mess and dormitories, while analysis of hardware and software needs is carried out to identify the tools needed during the application development process booking mess and dormitory.

Table 1. Software Requirement on the Application Booking Mess and Dormitory

Category	Module	Description
Dashboard	1. Dashboard Panel	A menu that will display a summary of the number of users, totalbooking messages that have been confirmed and have not been confirmed

	2.	User Confirmation	Menu to confirm the registration processuser student level andinternal
	3.	Confirmation of Mess and Dormitory Bookings	Menu or facilities for payment confirmation and approval of mess and dormitory reservations
	4.	Manage Facilities	This menu is used to set facilities, room prices, photos andcontent
	5.	Report	This menu contains Mess and Dormitory order reports which can be filtered bydate, month andyear
	6.	Setting	Menu forsetting information onhome page via admindashboard
Home page	1.	Home Page	Main menu display foruser
	2.	Registrasi User	Menu for student registration,User Internal andUser general
	3.	Login	Page login for User and Admin

In designing this application, the required hardware specifications can be seen in the hardware requirements table as follows:

Table 2. Hardware Requirements

No	Laptop Specification	Windows Version
1.	CPU	Minimal Speed 2.4 GHz equivalent Intel Core i3 or higher.
2.	RAM	8 GB
3.	Harddisk	100 GB
4.	Graphic	Minimum

Table 2 above is the required hardware or laptop specifications needed to create an application booking web-based UNP PESSEL mess and dormitory. Meanwhile, application software booking the resulting web-based UNP PESSEL mess and dormitory has database which was created using MySQL 5.7 and run on web server Apache 2.4. The application has a menu login which functions to limit access to the system.

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3.2. Design

The modeling needed to design and provide a general description of the web-based UNP PESSEL mess and dormitory booking application is used to explain the process, program flow and algorithms used [20]. To model the process, context diagrams and use case diagrams are used, and activity diagrams are used to describe the program flow. Meanwhile, to describe table details and field relationships, class diagrams are used.

3.2.1. Context Diagram

Context diagram displays the interaction between the system and the actors or entities involved and makes it easier to understand the flow of data from the system to each actor. The actors involved are admin and user. The form of interaction that occurs between actors and systems in this application can be seen in the application context diagram image as follows:

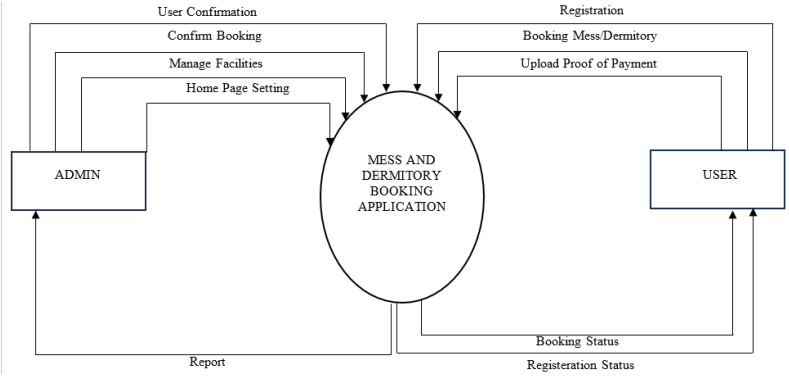

Figure 2. Application Context Diagram

3.2.2. Use Case

Use case diagram is modeling to describe the form of interaction between the system being built and actors. Useuse case diagram can define an interaction between one or more actors and the system. The form of the use case diagram can be seen in the application use case image booking mess and dormitory as follows:

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Figure 3. Application Use Case Booking Mess and Dormitory

3.2.3. Activity Diagram

3.2.3.1. User Registration Activity Diagram

Registration is a process carried out by user to have access to the application. Activity diagram registration by user which is divided into 3 categories or levels. In the picture above if user is a student and wants to do booking dormitory, when registering you have to choose a level user student.User level internal is the level for UNP employees, lecturers or students who will carry out activities in the mess. User the general level is type user for external users who want to stay at the UNP Pessel Mess.

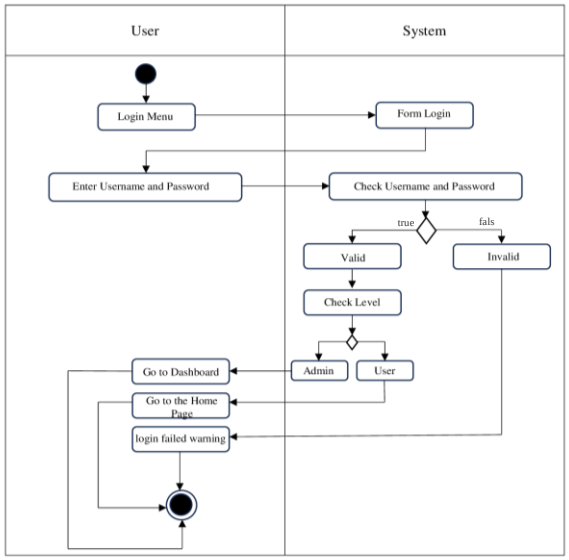

Figure 4. User Registration Activity Diagram

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3.2.3.2. Activity Login

Admin and user are the actors who will log in to the system. When logging in, an actor, either admin or user, will go through 2 stages of checking. In the first check, a check is carried out to check whether the account is valid or invalid. If the account is valid, it will be checked again, namely the user level. If the actor level is admin, the system will direct you to the admin dashboard page. If the actor level is a user, in this case the user category (student, internal and general) then the system will be directed to the home page.

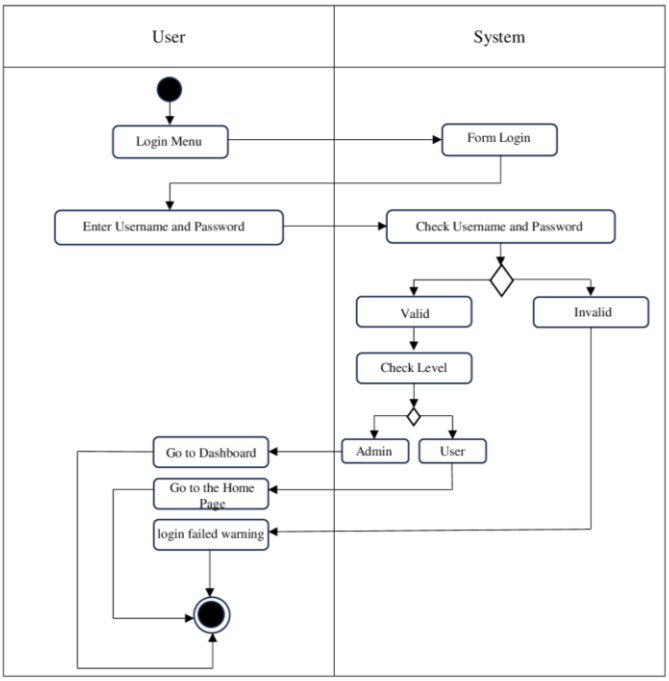

Figure 5. Activity Diagram Login

3.2.3.3. Activity Booking Mess and Dormitory

Mess and dormitory booking activity is an activity carried out by users to book messes and dormitories. There are three different forms for each level in the booking process. Users at student level on the booking page will only display the dormitory booking option. Internal level users will have access to select messes intended for internal activities. General level users will get a display of the booking form for room facilities for overnight stays as an external party to UNP. In this booking process, student and general level users must make payment to complete the booking process. Meanwhile, internal parties can have their bookings approved without needing to make payment first.

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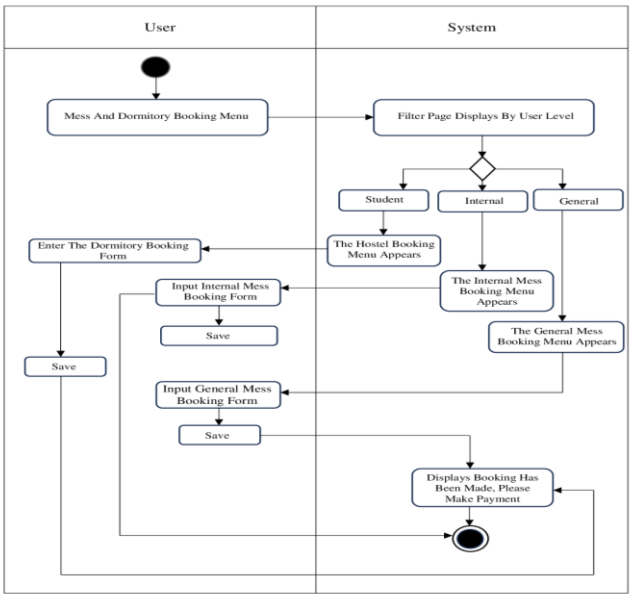

Figure 6. *Activity Diagram Booking Mess*

3.2.3.4. Activity Diagram Upload Proof and Confirm Payment

The activity diagram for uploading proof and confirming payments in the image above involves the interaction of admin and user actors in the system. Users at student and general level who have made a booking need to upload proof of payment to complete the booking process. This upload and confirmation process has several status levels related to payment, namely unpaid, paid, approved and rejected. When a user has uploaded and the payment has not been approved by the admin, the default payment status is unpaid. Further more, if proof of payment has been uploaded and approved by the admin, the payment status will become paid with notification that the payment has been approved by the admin. If the payment is rejected, the payment status will appear rejected.

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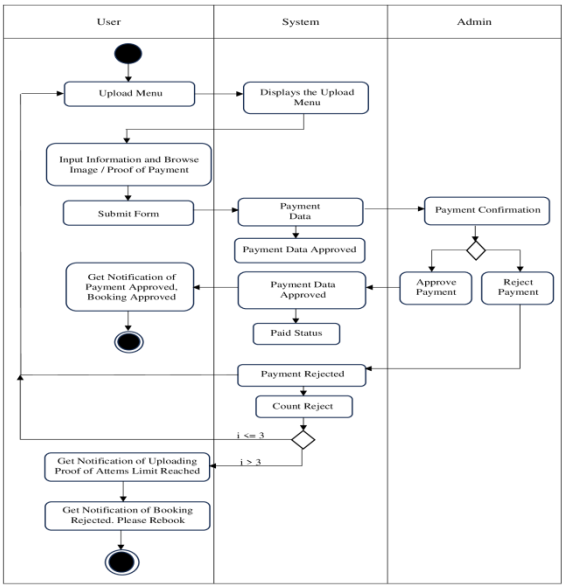

Figure 7. Activity Diagram Upload Proof and Confirmation Payment

3.2.3.5. Facility Management Activity Diagram

Activity diagram manage this facility is activity admin to manage facilities. Activity which the admin will go through to be able to manage the facilities in the application. Item existing facilities that will be managed in this facilities menu are room and meeting room facilities.

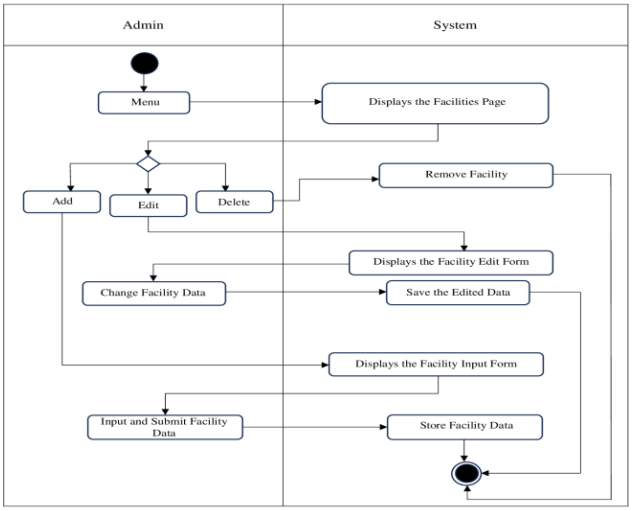

Figure 8. Facility Management Activity Diagram

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3.2.3.6. Activity Diagram Setting Home Page

This home page setting activity diagram is an admin activity for making settings or configurations that will appear on the home page. The configuration attributes that will be managed by the admin regarding home page settings are application name information, application description, logo and copyright.

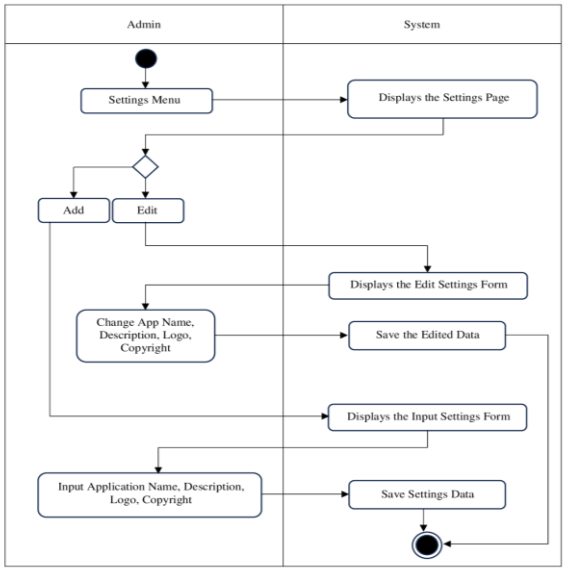

Figure 9. Activity Setting Home Page

3.2.4. Class Diagram

Class diagram used to clarify table relationships through binding field in database. Class diagram application booking web-based UNP PESSEL mess and dormitory are as follows:

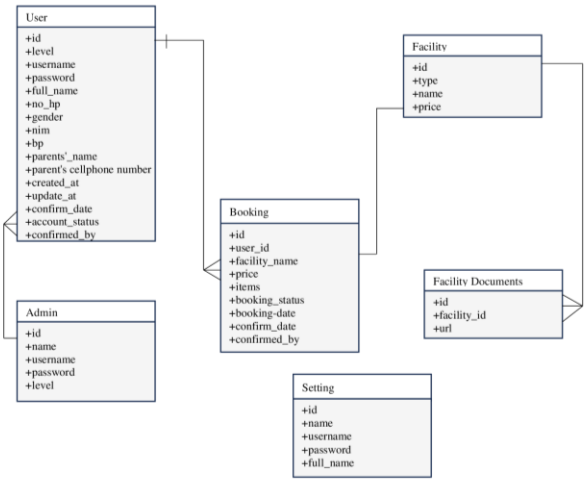

Figure 10. Application Class Diagram

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3.3. Implementation

The implementation stage is the realization stage of needs analysis, product specifications, and application designs that have been previously designed into databases, websites, and other software components.

3.3.1. Main Page

The main page is the page that appears and becomes the main landing page when the mess and dormitory booking application URL is opened. On this page there is a brief view of the application booking mess and dormitory of UNP South Coast Campus.

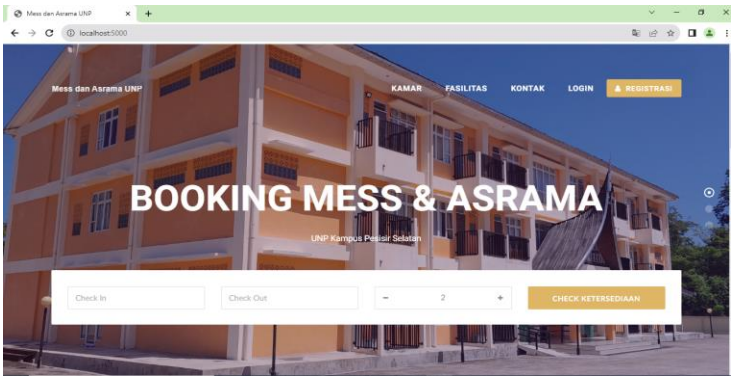

Figure 11. Home Page

3.3.2. Registration Page

Users can register via the registration feature or page. This registration page has 3 categories that users can choose when registering, namely student, internal and general. The registration page is shown in the image below:

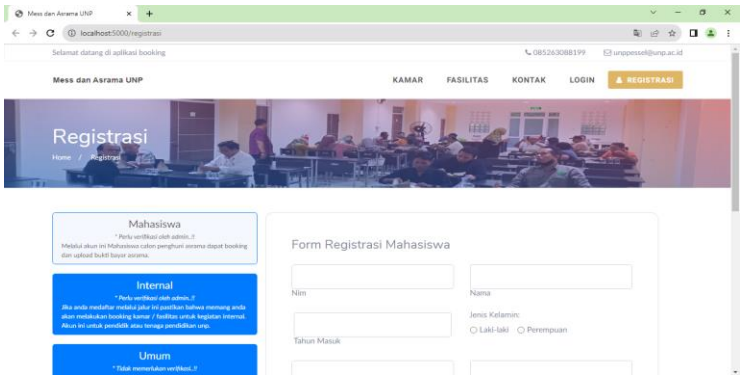

Figure 12. Registration Page

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3.3.3. Login Page

Login page is a site for login by admin and user to access the application booking mess and dormitory.

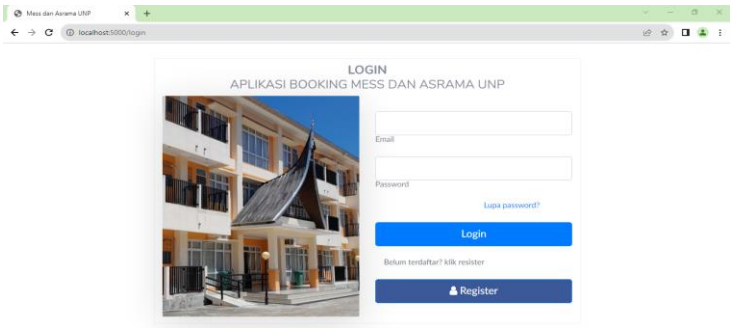

Figure 13. Login Page

3.3.4. Mess and Dormitory Booking Page

Afterlogin and register,user will have credential and withcredential which are owneduser can dobooking dormitory or mess. When booking user must fill in the date check in and date check out. On this page the price of the room selected by you is also displayed user.

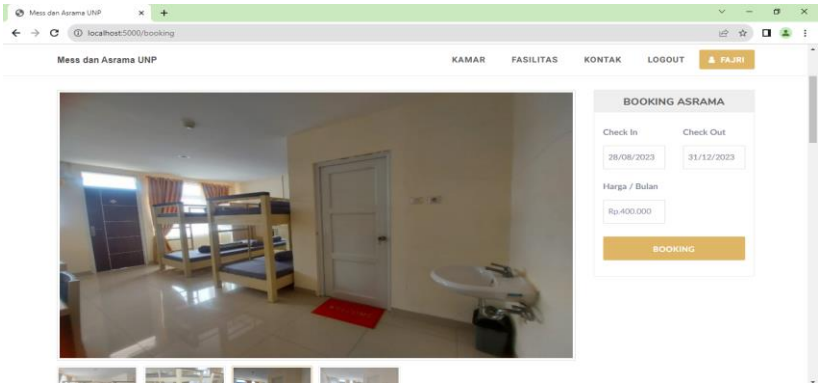

Figure 14. Booking Page

3.3.5. Page Checkout

Checkout is a process by the user to complete a booking. The checkout page for the mess and dormitory booking application looks as follows:

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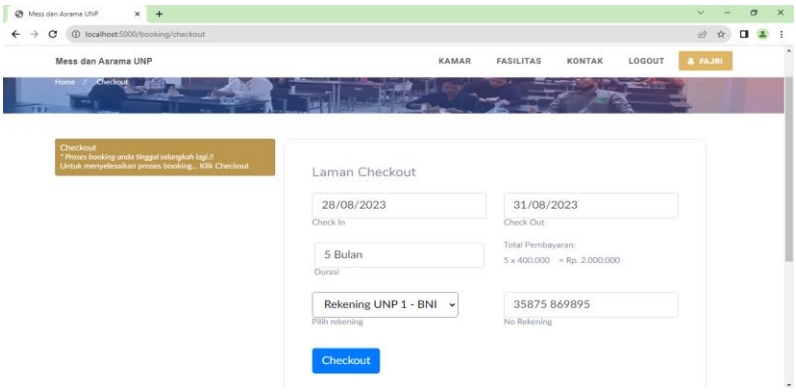

Figure 15. Page Checkout

Based on the design made in the previous stage. To be able to manage the application, an admin is needed who acts as a manager for each activity user with the system. After login through the page login on home page then admin will be directed to dashboard admin which has the following feature details :

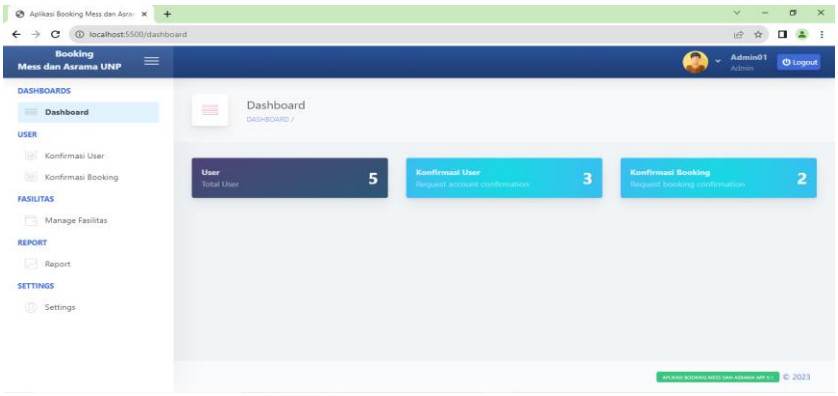

Figure 16. Dashboard Page

Dashboard page is the first page accessed by the admin after login. Page dashboard Admin has information in the form of a summary of user activity. The summary is the amount user, amount user unconfirmed and amount booking which has not been confirmed by the admin.

4. CONCLUSION

The conclusions from this research refer to the results of the research design as follows:

1) The web-based PESSEL booking mess and dormitory design for Padang State University was successfully built using the Laravel Framework version 5.8, which can

help websites quickly because it has third party vendor features that are Open Source. The process of writing code is also more organized thanks to Laravel's MVC structure.

2) Then, to overcome the problems that exist in the Padang State University Mess and Dormitory, Web-based PESSEL can provide easy service for students, UNP staff, community members outside UNP in the computerized ordering and reporting process.

REFERENCES

[1] S. Nuryani, "Pengembangan Aplikasi Mobile Booking Online Perawatan Gigi dengan Metode Prototype Studi Kasus di Klinik Gigi Budiono, Drg. Kota Bandung," *J. Ekon. Sos. Hum.*, vol. 2, no. 06, pp. 18–28, 2021, [Online]. Available: https://www.jurnalintelektiva.com/index.php/jurnal/article/view/390/270

[2] A. Yanto and N. Faizah, "Rancangan Aplikasi Sistem Reservasi Tamu Balai Besar Pelatihan Kesehatan Jakarta Kampus Hang Jebat Berbasis Web Dengan Metode Rapid Application Development (RAD)," *J. Digit. Technol. Trend*, vol. 1, no. 2, pp. 62–71, 2022, doi: 10.56347/jdtt.v1i2.47.

[3] B. A. A. Putra and S. Sukirman, "A Development of Multiplayer Educational Game as Learning Media to Introduce to Computer Hardware," *J. Teknol. Inf. dan Pendidik.*, vol. 16, no. 1, pp. 14–26, 2023, doi: 10.24036/jtip.v16i1.693.

[4] J. Damanik, "Jurnal Teknologi Informasi Dan komunikasi," *J. Int. Ti2*, vol. 5, no. 1, pp. i–viii, 2016.

[5] R. Khoiruna, F. Azm, and R. A. Nugrahaeni, "NLP Pada Chatbot Untuk Layanan Akademik Menggunakan Metode AIML," *eProceedings …*, vol. 10, no. 1, pp. 515–523, 2023, [Online]. Available: https://openlibrarypublications.telkomuniversity.ac.id/index.php/engineering/article/view/19351%0Ahttps://openlibrarypublications.telkomuniversity.ac.id/index.php/engineering/article/view/19351/18709

[6] R. F. Syafariani, D. Ginanjar, and E. N. Hayati, "Website-Based Information System on Drug Purchases and Sales at Pharmacy," *J. Teknol. Inf. dan Pendidik.*, vol. 14, no. 2, pp. 172–177, 2022, doi: 10.24036/jtip.v14i2.448.

[7] N. S. A. Laily and Rapina, "Rancang Bangun Rumah Kost Berbasis Web Untuk Memudahkan Pencarian Kost Di Kota Batam," *Zo. Komput.*, vol. 11, no. 1, pp. 49–57, 2021, doi: https://doi.org/10.37776/zk.v11i1.663.

[8] R. D. Cahyani and H. S. Utomo, "Implementasi Aplikasi Manajemen Mess (AMM) Berbasis Web," *Ultim. InfoSys J. Ilmu Sist. Inf.*, vol. 12, no. 1, pp. 21–25, 2021, doi: 10.31937/si.v12i1.1574.

[9] E. N. Jannah, M. Masrur, and S. Asiyah, "Penerapan Framework Yii dalam Pembangunan Sistem Informasi Asrama Santri Pondok Pesantren sebagai Media Pencarian Asrama Berbasis Web," *J. Inf. Syst. Eng. Bus. Intell.*, vol. 1, no. 2, p. 49, 2015, doi: 10.20473/jisebi.1.2.49-58.

[10] M. A. Kresnanto, B. T. Hanggara, and B. S. Prakoso, "Analisis Pengalaman Pengguna pada Aplikasi Mobile Booking Hotel dengan menggunakan Metode User Experience Questionnaire (UEQ) (Studi pada RedDoorz dan Airy)," *J. Pengemb. Teknol. Inf. dan Ilmu Komput.*, vol. 4, no. 10, pp. 3637–3646, 2020, [Online]. Available: https://j-ptiik.ub.ac.id/index.php/j-

P.ISSN: 2086 – 4981
E.ISSN: 2620 – 6390
tip.ppj.unp.ac.id

ptiik/article/view/8063/3772
[11] S. Syukhri and P. Gusmayeni, "Design of Web-Based Archive Management Information System," *J. Teknol. Inf. dan Pendidik.*, vol. 14, no. 2, pp. 92–98, 2021, doi: 10.24036/tip.v14i2.429.
[12] A. Hidaya, N. Q. Ridhaihi, M. F. A. Shiddiq, F. T. Ra'pak, and A. A. Khaerunnisa, "Pengembangan aplikasi mysaku menggunakan metode waterfall," *Indones. Technol. Educ. J.*, vol. 01, no. 02, pp. 68–77, 2023, doi: https://doi.org/10.61255/itej.v1i2.178.
[13] M. R. Darmawan and H. A. Musril, "Perancangan Sistem Pendaftaran Audiens Seminar Proposal di Institut Agama Islam Negeri (IAIN) Bukittinggi," *J. Teknol. dan Inf.*, vol. 11, no. 1, pp. 26–39, 2021, doi: 10.34010/jati.v11i1.
[14] P. I. Lestari and E. Roesminingsih, "Aplikasi Berpijar : Upaya Mewujudkan Link and Match," *J. Educ. Learn. (EDU Learn.*, vol. 2, no. 1, pp. 62–72, 2023, [Online]. Available: https://internationalinstituteofresearch.org/journal/index.php/EL/article/view/21/24
[15] H. K. Aroral, "Waterfall Process Operations in the Fast-paced World : Project Management Exploratory Analysis," *Int. J. Appl. Bus. Manag. Stud.*, vol. 6, no. 1, pp. 91–99, 2021, [Online]. Available: https://www.ijabms.com/wp-content/uploads/2021/05/05_ARORAL_PB.pdf
[16] I. W. W. Karsana and P. A. Kurniawijaya, "Pengembangan Aplikasi Booking Online Pasien Rawat Jalan Rumah Sakit Berbasis Android," *JUKI J. Komput. dan Inform.*, vol. 4, no. 2, pp. 117–123, 2022, doi: https://doi.org/10.53842/juki.v4i2.123.
[17] T. A. Irawaty, "Pengembangan Sistem Informasi Akuntansi Penjualan Pakaian (Studi Kasus : Orbsco Bandar Lampung)," *J. Ilmu Data*, vol. 2, no. 10, pp. 1–9, 2022, [Online]. Available: http://ilmudata.org/index.php/ilmudata/article/view/247/239
[18] N. Rachma and I. Muhlas, "Comparison Of Waterfall And Prototyping Models In Research And Development (R & D) Methods For Android-Based Learning Application Design," *J. Inov. Inov. Teknol. Inf. dan Inform.*, vol. 5, no. 1, pp. 36–39, 2022, doi: https://doi.org/10.32832/inova-tif.v5i1.7927.
[19] A. Y. Ardhiansyah, D. L. S. Putra, J. S. Kristanto, N. P. Bud, and F. I. Maulana, "Waterfall Model for Design and Development Coffee Shop Website at Malang," *Int. Conf. Informatics, Multimedia, Cyber Inf. Syst.*, vol. 2, no. 2, pp. 12–19, 2022, doi: 10.1109/ICIMCIS56303.2022.10017450.
[20] S. R. N. Ahmad and M.Salim, "Website-Based E-Market (E-Patali) Application For Gorontalo City Central Market," *J. Teknol. Inf. dan Pendidik.*, vol. 16, no. 1, pp. 64–74, 2023, doi: 10.24036/jtip.v16i1.350.