

Design And Build Of The Unires Student Dormitory Management System Of Umy Integrated With The Campus System

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Abstract

The design and build of the Unires student dormitory management system of UMY integrated with the campus system with the Laravel framework aim to aid office and development staff. This system contained two types and several levels of roles. The roles were on the staff and resident sides. Concerning the staff, the roles comprised the director, staff, caregivers, technicians, new student admission committees (penmaru), launders, and examiners. Meanwhile, on the resident side, it consisted of the supervisor, senior, senior assistant, and resident. Access and features for each position varied based on the requirements of the function. The login for staff required a username and password freely determined. On the other hand, the resident position utilized the Single Sign-On procedure connected with UMY. Display for staff was standard with widescreen sizes. Unlike the system for staff, the residents' display had a mobile-first design, meaning that it looks best on a tiny screen but is still legible when viewed on a large screen. Through the Bureau of Information System (BSI) of UMY, this system was also indirectly linked to the bank's payment system. This technology would make the management and development of student dormitories simpler, more effective, and more efficient.

Keywords: *Applications, Laravel, Web Services, Websites, Integrated Systems*

1. Introduction

A dormitory is a place to live for a group. Sometimes, dormitories take the form of a building with many rooms that can accommodate multiple individuals each. The residents of dormitories will remain for an extended amount of time. The cause might be the distance from their home or the comparably lower price [1].

University residence (Unires) is a dormitory at Universitas Muhammadiyah Yogyakarta (UMY) for students, particularly recently registered ones. Unires is a student dormitory that participates in UMY's self-development program. It has a management system and structural organization. Nonetheless, the operational management process continues to rely on manual or conventional systems, making it less effective and efficient. Accordingly, a digital system that handles both technical and administrative procedures is required to boost the efficacy and efficiency of its management.

To develop this digital system, researchers have reviewed several previous research. Here are the results. The first is Manuputty in his research entitled "System Design Information on Research Licensing Applications with Agile Methods and the Laravel Framework Website Based" [2]. explains that use of Laravel will summarize the program code used. Developers don't either need to write program code that has been previously written to be used on different places, so that the website development process will shorten the time needed. Apart from that, Laravel also has well-documented rules and

used as a reference for other developers to make it easier to develop. Laravel supports application development with the Models Views Controllers (MVC) architecture, Bootstrap and JavaScript which make the website more responsive. The purpose of this research is to support the management of work application data practices, data collection and surveys at the National and Political Unity Agency (Bakesbangpol) Salatiga City Government. In this study, the Agile method and the Laravel framework were used in making websites. To describe the needs of users, it is also used Unified Modeling Language (UML). In the testing section, the process is carried out with using the White-box Testing method.

The second research is "LARAVEL A PHP Framework for E-Commerce Websites"[3] . In his research explained that the development of applications using PHP is quite time consuming and requires a deep technical understanding, sometimes even we need to write it down program code repeatedly in the same project. Website security is also a thing important in the business world. With the use of a framework, developers don't really have to deepen about system security, as most of the framework has handled common security issues such as SQL Injection, Cross-Site Request Forgery (CSRF) and Cross-Site Scripting (XSS Attack). The advantage of using Laravel is that website development is easier advanced, low time required as well as the use of namespaces and interfaces that are helps to organize the application structure. Laravel can connect with Database using RAW SQL, Fluent Query Builder and Eloquent ORM. Apart from that, Laravel too has artisan commands that help developers in application development, such as facilitates the migration of databases, creation of models, views and controllers.

The third research was conducted by Sendiang with the title "Optimizing Laravel Authentication Process" [4] explains the importance of authentication process. Authentication means unknown users will not be allowed to access the website. Laravel facilitates developers to implement authentication process. However, according to him the process is vulnerable to Dictionary attacks Attack and Brute-force Attack. Optimal authentication process is a way to improve Laravel's security at login. The trick is to count how many users based on the ip address, make a login request on the system. If login request exceeds the specified limit, then the login process will be slowed down so that Dictionary Attack and Brute-force Attack will be hampered The fourth research is owned by Voda entitled "Migrating Existing PHP Web Applications to the Cloud" [5] . which discusses when and why a PHP based applications need to use the Cloud.

The fifth research is entitled Development of an Online Ticket Ordering Application for Ferry Crossing Website Based in the Lake Toba Region [6] .Which explains well the process of developing the Online Ticket Ordering Application with waterfall development method. This research explains the importance of digitalization and Application of information technology infrastructure to reduce sales time and queues buy tickets. In this study it was also explained that the choice to use the Web Application is because of its high level of compatibility (accessible via Computer or Smartphone), as well as ease of use such as no need to install an application any additions on the user side and there is no need for the creation of multiple versions of the app for different operating systems.

1.1 Information System

Information System is a system owned by a group that organize daily operational needs, managerial and activities of the group, as well as certain reports made available to outsiders [7].

1.2 Bash

Bash is a shell program (command interpreter) for operating systems based on GNU. The name Bash itself is an acronym for the "Bourne-Again SHell" pun from Stephen Bourne as the direct author of the current Unix shell(sh). Bash is development over Bourne Shell (sh) and incorporates some features from Korn Shell (ksh) and C Shell (csh) [8].

1.3 Visual Studio Code

Visual Studio Code (VS Code) is a lightweight yet powerful source code editor have high performance. VS Code is available for use on Windows, macOS and also Linux. VS Code supports JavaScript, TypeScript and Node.js directly, and has many extensions that support other languages such as C++, C#, Java, Python, PHP) and runtimes such as .NET and Unity [9].

1.4 Frameworks

Framework is a framework used to develop applications. Frameworks provide a base for development, such as classes and functions, that can be used by developers to create an application. Frameworks have libraries, compiler/interpreter, and other programs needed in the process application development [10].

2. Method

System development is a system creation method, often known as the Software Development Life Cycle (SDLC). In addition, the SDLC is a descriptive model or perspective on the application development process. The SDLC explains how a particular application is created historically. Several SDLC models have been frequently employed in application development, including waterfall, agile, and spiral. In this study, the waterfall approach was utilized to design a system. It is a paradigm with a sequential process, implying that the process must be completed from top to bottom in sequence (like waterfalls). Planning, needs analysis, design, development, integration and testing, and installation and delivery are the phases of the waterfall model. The steps are listed below.

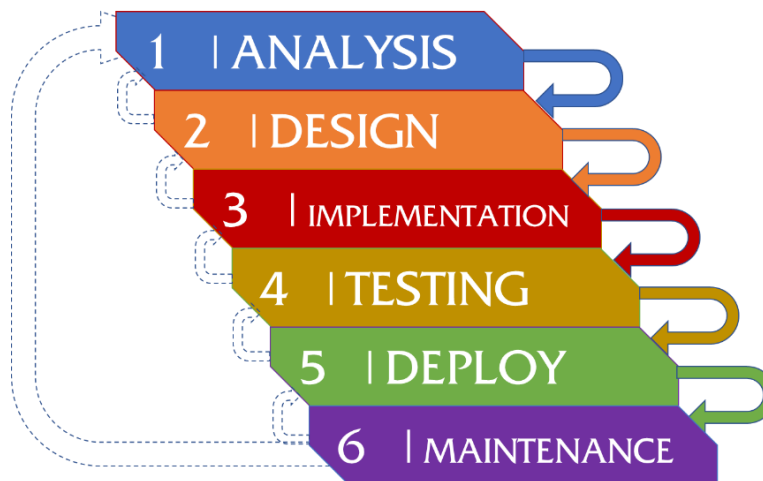


Figure 1 Software Development Lifecycle

2.1. Analysis

An analysis is an initial stage in application development. At this stage, the required information for creating the UMY Unires student dormitory management application was gathered through interviews. The results of this analysis eventually became a solution to current issues.

2.2. Design

Design refers to the phase in which the interface, database, and system flow were created for the system. It aimed to determine what this UMY Unires student dormitory management application required. Hence, the application created met the requirements. The design described the type of application. Visual paradigm

application using the UML concept was employed for database design and system flow, specifically entity relationship diagram to describe the database and class and activity diagrams to define the system flow.

2.3. Implementation

The implementation phase was when a previously created design was transformed into an operational system. The implementation employed Bootstrap as the frontend framework, Laravel as the backend framework, and MySQL as the SQL database (with the help of Laravel migration). The application was implemented using and adhering as closely as possible to its previously specified interface, database, and system flow. This step was the most time-consuming since application development involved transforming a system into its physical form.

2.4. Testing

Testing, essential to the SDLC, was performed following the completion of the implementation. It aimed to ensure that the created application was of high quality and conformed to the expectations established in the preceding phase. It was conducted utilizing black-box testing, a method focusing on revealing whether the intended outcomes are achieved and not on how the application on the inside works.

2.5. Deployment

Deployment is the point at which the application has been completed and utilized by the user, in this instance, the UMY Unires student dormitory. The deployment collaborated with the Information System Bureau (BSI) of UMY, providing the application server. Installing the application on the UMY server made the application's data more secure and credible, and centralized.

2.6. Maintenance

The final phase was maintenance, a continual stage taking the shape of adjustments, changes, or enhancements because the system's adaptability relied on the actual situations. Maintenance also comprised ongoing security, patched when a security flaw was discovered in the application.

3. Results

3.1 Results and Discussion

3.1.1. Analysis and Design

The system's analysis and design generated a database design used to store the data required by the system. The results are as follows. This entity-relationship diagram (ERD) is broadly separated into two sections: new student admission committees (penmaru) and operation. Nevertheless, it resided in a single database. Penmaru contained tables related to new student admissions data: applicants, applicants' parents, medical history, achievements, payment schedules, and exam schedules. In contrast, the operation section included other features: residential, coaching staff, master data, programs, *tengko*, and penmaru.

3.1.2. Implementation

The implementation utilized the Laravel framework. It is a framework for web development based on the PHP programming language. It was intended to enhance the application quality by facilitating its construction and maintenance. It also improved the working experience by offering clean code and a collection of methods that reduced development and implementation time. Laravel Homestead was also utilized as a development environment to aid system development. Laravel Homestead is a vagrant box with an official development environment. It comprises various other software required to construct Laravel applications, including Nginx (Web Server), PHP, MySQL, Postgres, Redis, Memcached,

NodeJs, and more. It is packed with vagrants to operate on various existing systems. This system's final output had a display with the following template.

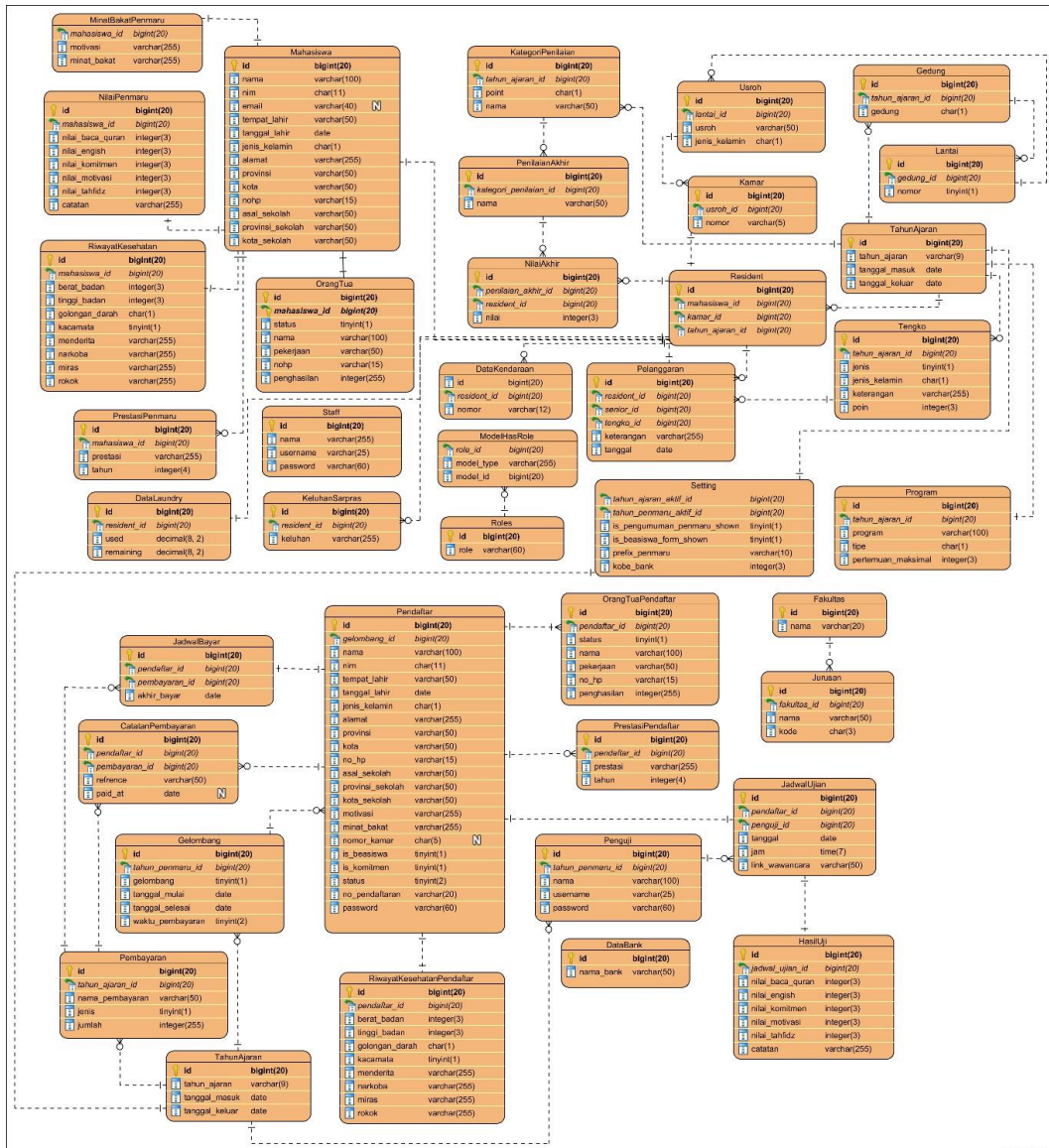


Figure 2 Diagram - Entity Relationship Diagram

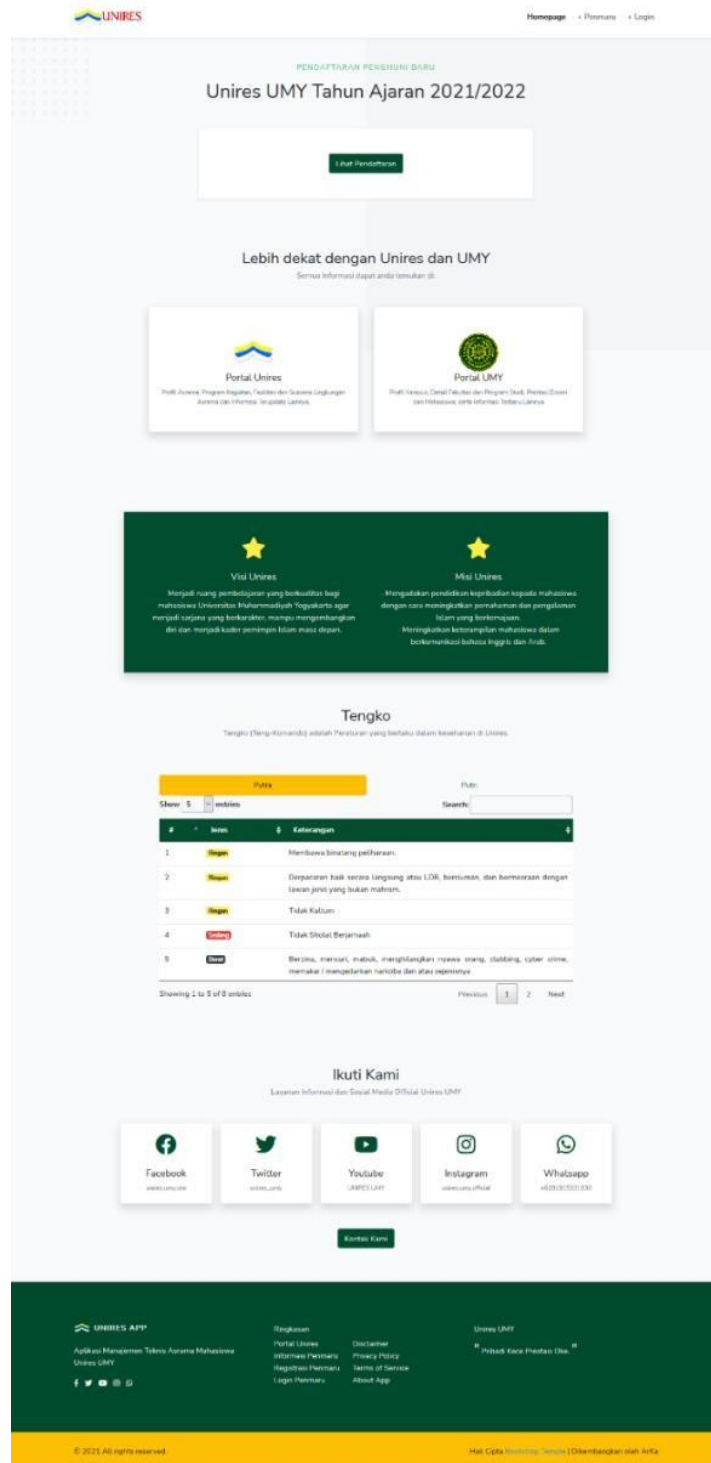


Figure 3 Interface - Homepage

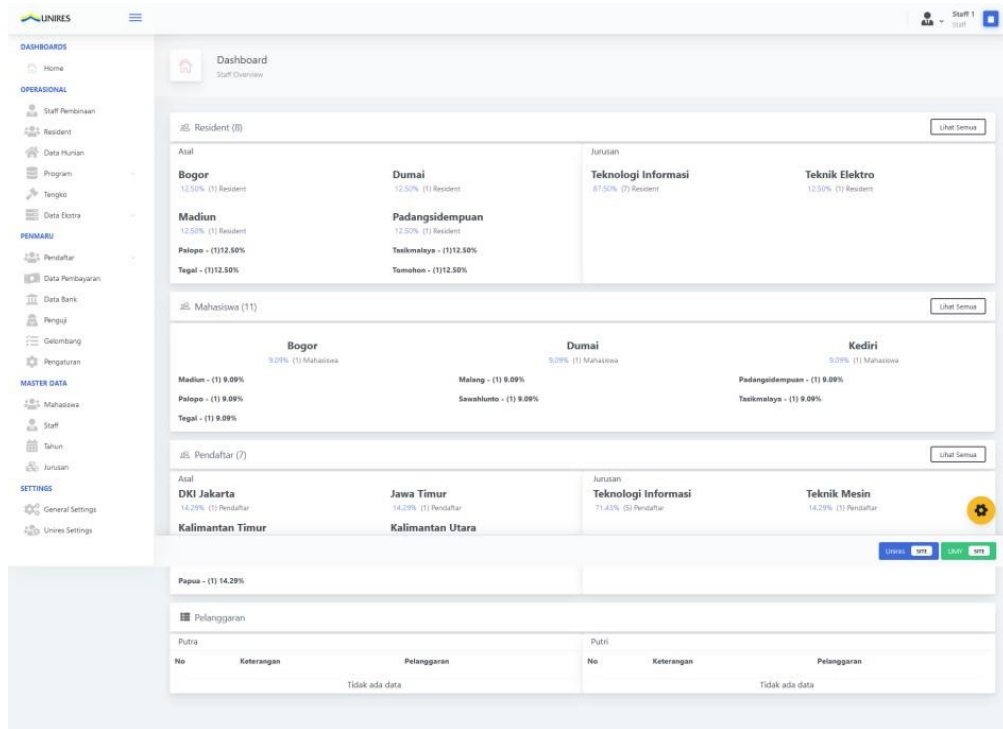


Figure 4 Interface Staf – Dashboard

3.1.3. Testing

Black-box testing was employed. Black-box or functional testing is an approach in which the software tester does not need to know or have access to the system’s source code. It does not focus on the internal mechanism of the system. Instead, it prioritizes the results of a function, such as what kind of output will be generated when a specific input is performed. If the outcome matches expectations, the testing procedure is deemed successful. Existing features must be tested to ensure that they perform correctly. As previously established, black-box testing focuses on the functionality of an application’s features without requiring knowledge of its flow. The following are the tests conducted.

Category	Description	% TCs Executed	% TCs Passed	TCs pending	Priority	Remarks	Number of defects	Defect fixed
Front	Melihat Halaman Depan atau Homepage	100%	100%	0	Low		0	0
	Melihat Halaman Disclaimer	100%	100%	0	Low		0	0
	Melihat Halaman Privacy Policy	100%	100%	0	Low		0	0
	Melihat Halaman Terms of Service	100%	100%	0	Low		0	0
	Melihat Halaman About App	100%	100%	0	Low		0	0
Staff	Login Staf	100%	100%	0	High		0	0
	Menampilkan Dashboard Staf	0%	0%	1	Low		0	0
	Menampilkan halaman Data Staf Pembinaan	100%	100%	0	Low		0	0
	Mencari Data Staf Pembinaan	100%	100%	0	Low		0	0
	Memindahkan Staf Pembinaan	100%	100%	0	Medium		0	0
	Menghapus Staf Pembinaan	100%	100%	0	Medium		0	0
	Menampilkan halaman data Resident	100%	100%	0	Low		0	0
	Mencari Data Resident	100%	100%	0	Medium		0	0
	Memindahkan Resident	100%	100%	0	Medium		0	0
	Menghapus Resident	100%	100%	0	Medium		0	0
	Menampilkan halaman Data Hunian	100%	100%	0	Low		0	0
	Menambahkan Gedung	100%	100%	0	Medium		0	0
	Menambahkan Lantai	100%	100%	0	Medium		1	0
	Menambahkan Usroh	100%	100%	0	Medium		0	0
	Menambahkan Kamar	100%	100%	0	Medium		0	0
	Menghapus Data Hunian	100%	100%	0	Medium		0	0
	Menampilkan halaman Data Program	100%	100%	0	Low		0	0
	Menambahkan Data Program	100%	100%	0	Medium		0	0
	Mengubah Data Program	100%	100%	0	Medium		0	0
	Menghapus Data Program	100%	100%	0	Medium		0	0
	Menambahkan Kategori Penilaian	100%	100%	0	Medium		0	0
	Menambahkan Penilaian Akhir	100%	100%	0	Medium		0	0
	Menambahkan Nilai Akhir	100%	100%	0	Medium		0	0
	Menampilkan Data Tengko	100%	100%	0	Low		0	0
	Menampilkan Data Kehuhan Sarpras	100%	100%	0	Low		0	0
	Menampilkan Data Kendaraan	100%	100%	0	Low		0	0
	Menampilkan Data Laundry	100%	100%	0	Low		0	0
	Menampilkan Data Pendaftar	100%	100%	0	Low		0	0
	Menambahkan Data Pembayaran	100%	100%	0	Medium		0	0
	Mengubah Data Pembayaran	100%	100%	0	Medium		0	0
	Menambahkan Data Bank	100%	100%	0	Medium		0	0
	Menambahkan Data Penguji	100%	100%	0	Medium		0	0
	Menambahkan Gelombang Penmaru	100%	100%	0	Medium		0	0
	Pengaturan Penmaru – Tetapkan Tahun Penmaru Aktif	100%	100%	0	Medium		0	0
	Unggah Lembar Komitmen	100%	100%	0	Medium		0	0
	Unggah Berkas-berkas	100%	100%	0	Medium		0	0
	Unggah Berkas-berkas besar	100%	100%	0	Medium		0	0
	Beasiswa Aktif	100%	100%	0	Medium		0	0
	Prefix No. Registrasi	100%	100%	0	Medium		0	0
	Menampilkan Master Data Mahasiswa	100%	100%	0	Low		0	0
	Assign Role Mahasiswa	100%	100%	0	Medium		0	0
	Menampilkan Master Data Staf	100%	100%	0	Low		0	0
	Menambahkan Staf	100%	100%	0	Medium		0	0
	Menampilkan Master Data Tahun Ajaran	0%	0%	1	Low		0	0
	Menambahkan Master Data Tahun Ajaran	100%	100%	0	Medium		0	0
	Menampilkan Master Data Jurusan	100%	100%	0	Low		0	0
	Menambahkan Jurusan	100%	100%	0	Medium		0	0
	General Setting - Ubah Login Background Image	0%	0%	1	Medium		0	0
	Unires Setting – Ubah Tahun Ajaran Aktif	100%	100%	0	Medium		0	0
	Ganti Password Staf	0%	0%	1	Medium		0	0

Pendaftar Penmaru	Membuka halaman registrasi Penmaru	100%	100%	0	Medium	0	0
	Melakukan Pendaftaran berdasarkan NIM yang dicek sebelumnya	100%	100%	0	High	0	0
	Mengisi data diri pada menu Kelengkapan Data Diri	100%	100%	0	High	0	0
	Mengunggah berkas-berkas yang diperlukan	100%	100%	0	High	0	0
	Halaman informasi jadwal wawancara	0%	0%	1	High	0	0
	Halaman selesai pendaftaran	0%	0%	1	High	0	0
	Login Page	100%	100%	0	Medium	0	0
Penguji Penmaru	Login sebagai Penguji	100%	100%	0	Medium	0	0
	Melihat daftar Uji dan Riwayat Uji	0%	0%	1	Medium	0	0
	Melihat detail pendaftar	100%	100%	0	Medium	0	0
	Memberikan Nilai Hasil Uji dan menyatakan kelulusan atau ketidaklulusan pendaftar	100%	100%	0	Medium	0	0
Supervisor	Login sebagai Supervisor	100%	100%	0	Medium	0	0
	Melihat Data Resident	0%	0%	1	Low	0	0
	Melihat Data Program	0%	0%	1	Low	0	0
	Melihat Pelanggaran	0%	0%	1	Low	0	0
	Menambahkan Data Tengko	100%	100%	0	Medium	0	0
	Melihat Data Laundry	0%	0%	1	Low	0	0
	Data Kendaraan	0%	0%	1	Low	0	0
	Menambahkan Kehuhan Sarpras	100%	100%	0	Medium	0	0
	Melihat Profile	0%	0%	1	Low	0	0

Figure 5 Test Summary Detail – 2

The following are the test results.

<i>EXECUTE</i>	PASSED	6
<i>D</i>		5
	FAILED	1
	<i>(Total) TESTS</i>	66
	<i>EXECUTED(PASSED + FAILED)</i>	
PENDING		27
IN PROGRESS		0
BLOCKED		0
<i>(Sub-Total) TEST PLANNED</i>		9
<i>(PENDING + IN PROGRESS + BLOCKED + TEST EXECUTED)</i>		3

4. Conclusion

After all development activities on the UMY Unires student dormitory management system had been completed, the new student admissions module (penmaru) was instantly activated and used as intended. The usage of the penmaru module and the student data administration and operation module were interdependent and inseparable. Thus, the objective of the UMY Unires student dormitory management system, assisting office staff in penmaru, administration, and operation, has been achieved. The UMY Unires development staff, encompassing the senior assistant, senior, and supervisor, has been aided by this system, such as better information dissemination and monitoring of violations committed by residents of Unires.

References

- [1] Bonny, Okto, Hermin Werdiningsih, and Bambang Suyono. 2015. “Redesigning Student Dormitories in West Jakarta (Emphasis on Modern Architectural Design),” (In Indonesia) 14.GCF Global. 2012. “Computer Basics: Understanding the Cloud.” GCFGlobal.Org. March 8, 2012. <https://edu.gcfglobal.org/en/computerbasics/understanding-the-cloud/1/>
- [2] Manuputty, Augie David, Steven Hendrawan, and Budi Haryanto. 2020. “Design of Information Systems for Research Permit Application with Agile Method and Website Based Laravel Framework.” *Journal of Information Systems and Informatics* 2 (1): 60–78. <https://doi.org/10.33557/journalisi.v2i1.45>. McCool, Shawn. *Laravel Starter: The Definitive Introduction to the Laravel PHP Web Development Framework*. Birmingham, UK: Packt Pub, 2013.
- [3] Yadav, Neha, Dharmveer Singh Rajpoot, and Shri Krishna Dhakad. 2019. “LARAVEL: A PHP Framework for E-Commerce Website.” In 2019 Fifth International Conference on Image Information Processing (ICIIP), 503–8. Shimla, India: IEEE. <https://doi.org/10.1109/ICIIP47207.2019.8985771>.
- [4] Sendiang, Maksy, Sonny Kasenda, Anritsu Polii, and Yoice Rita Putung. 2018. “Optimizing Laravel Authentication Process.” In 2018 International Conference on Applied Science and Technology (ICAST), 247–51. Manado, Indonesia: IEEE. <https://doi.org/10.1109/iCAST1.2018.8751257>.
- [5] Voda, Ionut. 2014. “Migrating Existing PHP Web Applications to the Cloud.” *Informatica Economica* 18 (4/2014): 62–72. <https://doi.org/10.12948/issn14531305/18.4.2014.06>.
- [6] Christensson,. 2013. “Framework Definition.” March 7, 2013. <https://techterms.com/definition/framework>.
- [7] Hutahaean, Jeperson. 2014. Information System Concept. (In Indonesia)
- [8] GCFLearnFree. 2007. “What Is Bash? (Bash Reference Manual).” December 17, 2007. https://www.gnu.org/software/bash/manual/html_node/What-is-Bash_003f.html.
- [9] Microsoft. 2015. “Documentation for Visual Studio Code.” Documentation for VisualStudio
- [10] Christensson,. 2013. “Framework Definition.” March 7, 2013. <https://techterms.com/definition/framework>.