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WEB-BASED APPLICATION TO CLASSIFY STUDENT'S REPORT OF MBKM PROGRAMS IN IBIKFTI

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ABSTRACT

IBIKFTI UNTAR is the Business Incubator and Collaboration of the Faculty of Information Technology at Universitas Tarumanagara. IBIKFTI has limitations through the website in data management of Merdeka Belajar Kampus Merdeka (MBKM) Programs. Based on the challenges, the author initiates to design of a web-based application for registration and data management. The development of the website follows the Software Development Life Cycle (SDLC) Waterfall model with an object-oriented approach adopting Unified Model Language (UML). This application uses PHP for website development and MySQL as the database. The design of a website utilizing classification features for data from the MBKM program, encompassing various categories, has been demonstrated to streamline the reporting, storage, and recapitulation of student data linked to a chosen MBKM program.

Keywords: *MBKM Program, management, website, PHP, MySQL.*

1. PREFACE

Introduction

Rapid and intense competition among students in order to gain experience for employement in a company and multinational organizations is a common phenomenon which refers to the paper by [1]. In response to this situation, Nadiem Makarim, the Minister of Education and Culture, has introduced a program called Merdeka Belajar Kampus Merdeka also known as MBKM [2]. The program has eight types of human resources in the professional realm and IBIKFTI has been involved in supporting this program that mandates students to engage in one of eight programs as an admission requirement [3]. Students ought to report their participation through the program on the IBIKFTI UNTAR website as data collection for faculty of technology information. The reporting process for the MBKM program on the website is constrained due to its focus on documenting internship activities, which is the primary program preferred by students. The limitation arises from the absence of parameters on the website to categorize data according to eight categories of MBKM Program. Consequently, the default value or parameter is exclusively set as internship. In cases where students participate in MBKM program other than internship, the reporting process mandates manual reporting, either through Google Sheet or by submitting documents directly to the faculty. Recognizing this challenge, the approach that will be taken is to design a new database based on the MBKM program categories to create a classification system between students and the program they are participating in. This development aims to streamline the good data recapitulation and display information for administrator and student efficiently.

Literature Review

Referring to the journal by [4], present a comprehensive overview of North Sumatra Province Youth and Sport Service Website in the context of applying for an internship program. The primary aim of this application is to facilitate registration process through the website and ensuring a quick

compilation data of applicant's document. Their research adopts the SDLC Waterfall Model and UML approach. The primary difference author's research is that the registration process is limited to single job opening, whereas in this research it can be conducted for various available job opening.

Following the work of [5] that developed an Internship Monitoring Application with SDLC Scrum Model. The primary objective is to streamline the reporting of attendance and activities during the internship program. In author's research, the application is mobile-based specifically on Android, while our study is focused on a website platform featuring the primary capability of applying to available MBKM programs collaborated with FTI UNTAR.

Website for the registration and dissemination of information regarding the internship program at the Riau Provincial Information and Statistics Communication Service. The website's development followed the SDLC Waterfall model, similar to our research. The website caters to two end-users, the admin and internship program registrants. In our study, we similarly focus on admin and students who participate in MBKM Programs [6].

The research on a web-based certified internship at PT. Semen Tonasa, employing the SDLC Waterfall Model. The distinction in this research lies in the varied function required. Unlike previous research, which concentrated on the process of the internship activities within companies, this study encompasses the management of classified data [7].

In relation to the journal of [8] that took a study to design a web-based internship registration employing the prototype method. In this particular investigation, there was an absence of data classification in the information to internship program registrants. However, the upcoming research will use method of SDLC Waterfall model and involve data classification through the use of dropdowns in interface website, serving as indicators in the input of MBKM Programs report submitted by students.

2. RESEARCH METHOD

The Development of IBIKFTI website follows the Waterfall model of Software Development Life Cycle (SDLC). Method of SDLC Waterfall is a process of developing a high quality software using a method and methodology that has previously been utilized in development which refers to the paper proposed by [9]. The process is carried out linearly and easy to apply into projects as a result of the most comprehensive and structured working scheme. The illustration of SDLC Waterfall Model can be seen in Figure 1.

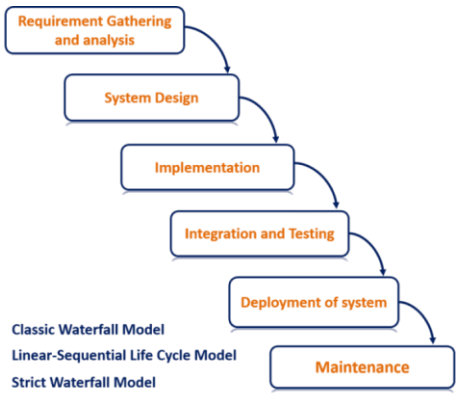


Figure 1. Scheme of SDLC Waterfall Model

Image Source [10].

The Waterfall model of SDLC has six stages in development process [9]:

1. Requirement Gathering and Analysis

The initial phase of SDLC involves collecting data, information, and constraints for the design of the software that will be used with the user. The data was acquired through an interview with a lecturer from the faculty of Information Technology, focusing on the reporting of student's data within the MBKM Program. This phase revealed a deficiency in the current website, specifically in its ability to generate reports beyond the scope of the internship program.

2. System Design
   Second, designing the system infrastructure of software and interface, which serves as a prerequisite for software development. Following the data collection and its conversion into requisite information for the website, attention is directed towards delineating software development prerequisite are Use Case Diagram for the business processes through the activity can be done by admin and student, Logical Database for the comprehensive representation of information through visual depictions and elucidates the relationship between entities, and last the wireframe of implementation Use Case Diagram and Logical Database into a new user interface of IBIKFTI's website.
3. Implementation
   In the third phase, the focus is directed towards implementing the system architecture into a programming language. This involves addressing both the back-end processes related to create the database of website with Adminer that support MySQL features and the front-end of the website with Laravel Framework to ensure accessibility and user-friendliness for the end-user.
4. Integration and Testing
   Upon the completion of the implementation phase, an extensive software testing procedure is initiated to validate predefined requirements and resolve potential issues on the website. The testing will involve Faculty of Information Technology lecturers and specifically aimed at conducting use case tests for the classify the data of MBKM Program.
5. Deployment of System
   Once the website successfully completes the testing phase, it becomes prepared for distribution among end-users for reporting their involvement in MBKM Program. During the system deployment, a paid hosting service will be employed to facilitate internet accessibility.
6. Maintenance
   The last phase of SDLC is identified addresses issues in the previous phase or new issue that may be arise after the software released. Within this phase, there exists an opportunity to execute upgrades to accommodate the supplementary requirements of the Faculty of Information Technology. This action aims to proactively mitigate the potential emergence of bugs within the system.

3. RESULT AND DISCUSSION

The outcomes and discourses derived from applying the SDLC Waterfall model to the web-based application for categorizing the data of MBKM Program are delineated in six phases, mirroring the utilized methodology:

1. Requirement Gathering and Analysis
   During this initial phase, upon analyzing the data from the resource person, it become evident that the IBIKFTI's website lacks an database to classify the eight MBKM Program categories. This absence significantly affects all student information, leading the necessity for admin to categorize the data manually.
2. System Design
   In design phase, the author develops the system infrastructure and Unified Model Language (UML). The UML approach is Use Case Diagram that defined about the newest system of

IBIKFTI's website obviously the classify features of MBKM Program while the student was reporting acceptance MBKM Programs. The Use Case Diagram can be seen in Figure 2.

Subsequently, use case scenario, activity diagram, sequence diagram, and class diagram are developed to furnish comprehensive details regarding the envisaged application. Next, the author proceeds to formulate the database in forms of conceptual design, logical design, and data file specifications. In contrast to a conceptual database, the utilization of a logical database affords a more comprehensive representation of information through visual depictions and elucidates the relationship between entities. The logical database design can be seen in Figure 3.

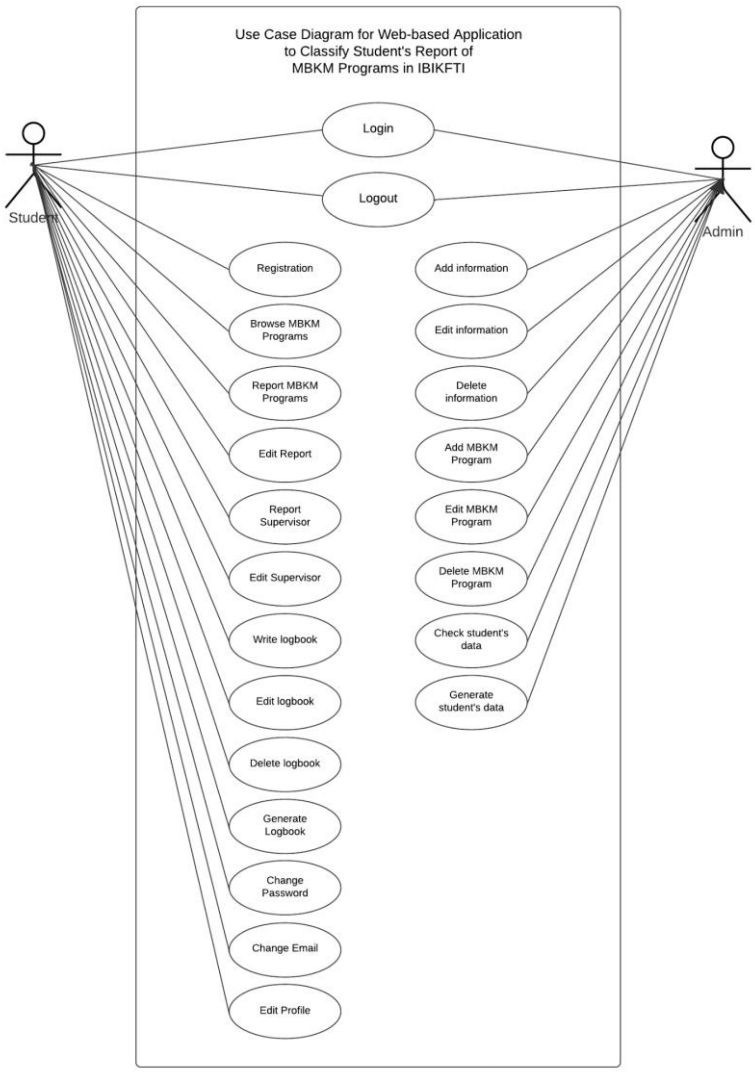


Figure 2. Use Case Diagram of the website

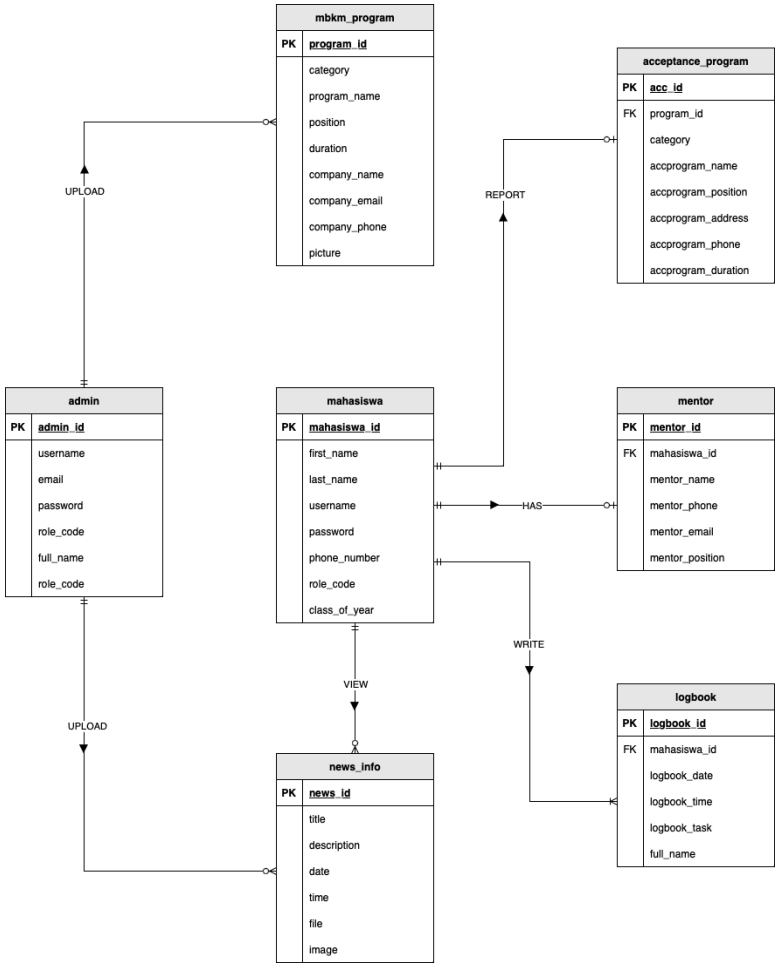
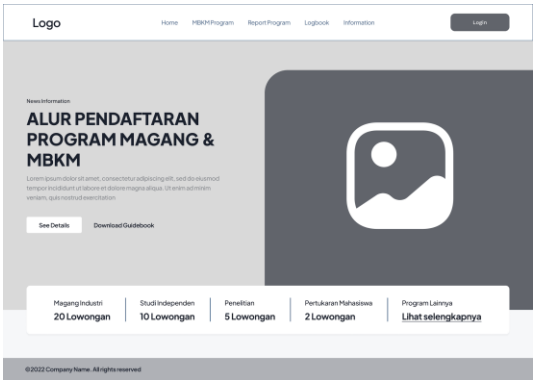


Figure 3. Logical Database Design

Upon the completion of the database design, the author initiates to implement the infrastructure system in low-fidelity design as known as wireframe. The author uses Figma for create and integrate the use case diagram and logical database design into a wireframe. The first wireframe is the homepage of the IBIKFTI Website, showcasing a navigation bar with four menus consist of MBKM Programs, Report Program, Logbook, and Information. To input information of MBKM Program, student's can click the '*Lapor Data*' button at the top right of the website. The wireframe of homepage and report program can be seen in Figure 4. and Figure 5.



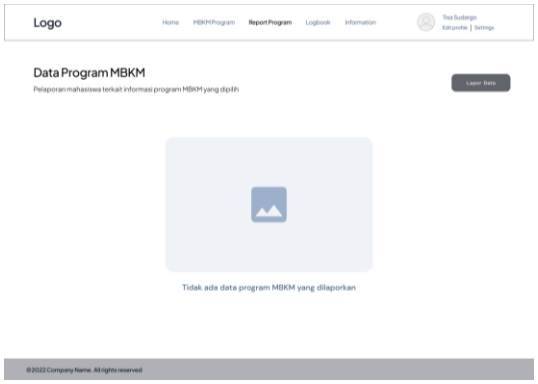
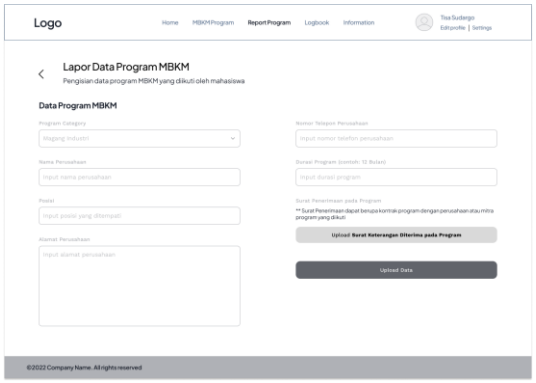


Figure 4. Homepage of IBIKFTI Website

Figure 5. Report Page with No Information

After clicking the '*Lapor Data*' button, the page redirects to a form report data that includes a dropdown component for MBKM Program categories. The dropdown provides to categorize the student's data related the attended MBKM Program, thereby streamlining the back-end process to classify the information. The Report Form page can be seen in Figure 6. For the detail of dropdown component can be seen in Figure 7



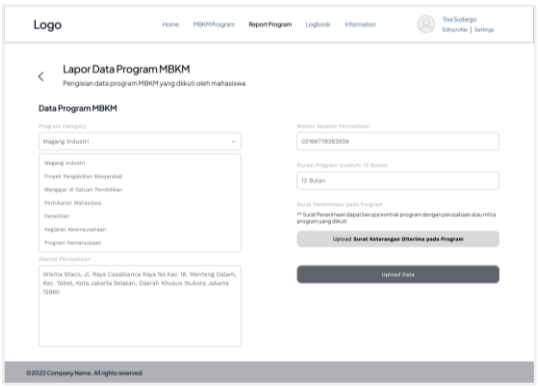
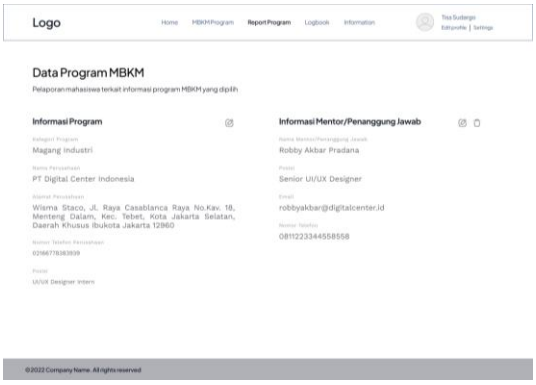


Figure 6. Form report MBKM programs

Figure 7. Dropdown with the categories

Once the students complete to report their participation information in one of MBKM Programs, the data will show on their report page and also be stored in the database. Students have to provide details of their supervisor throughout their program engagement, serving the faculty's needs and other pertinent purposes. The report page contains comprehensive data about MBKM Program and Supervisor can be seen in Figure 8.

In the admin site, student's data is structure in tables representing one of eight MBKM Programs categories. This page includes filter component to search any specific data of students. Admin can generate the data into a PDF form by clicking the 'Generate All Student Data' button. The student's information in admin side can be seen in Figure 9.



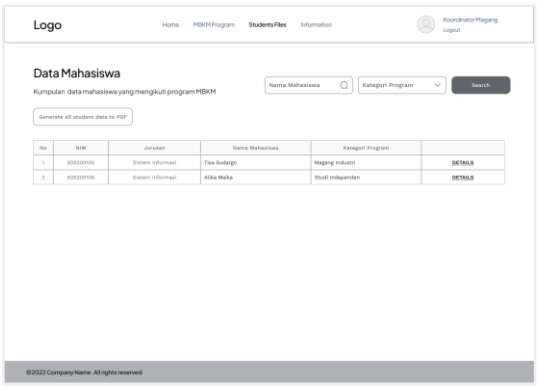


Figure 8. Filled student's report page

Figure 9. Student's report in admin side

3. Implementation

In this phase, the focus is on developing the front-end and back-end processes of the website. The author use Visual Studio Code as the text editor application, Laravel Framework to implement the PHP programming language, and PHP Monitor to establish a local web server in order to connect to Adminer for accessing MySQL features.

4. Integration and Testing
   Once the implementation phase is finished, all the feature in IBIKFTI Website will be conducted to the black box testing method. The testing focused on the functionality of all the feature specially for the classification feature for MBKM Program data. The testing of the new IBIKFTI website has already been conducted with the lecturer in the Faculty of Information Technology. The result of the testing can be seen in Table 1.

Table 1. Result of User Acceptance Testing (UAT)

No	Test Case	Pass/ Fail
1.	Registration	Pass
2.	Login	Pass
3.	Logout	Pass
4.	The system displays the homepage for student	Pass
5.	The system displays the homepage for admin	Pass
6.	The system displays the report page	Pass
7.	Reporting information about the MBKM Program	Pass
8.	The system displays student's information and the classification of MBKM Program	Pass
9.	The system generates student's information in PDF form	Pass
10.	Change email and password	Pass

According to the UAT results, the classification feature on the new IBIKFTI website has been verified to receive input data from students regarding their participation in an MBKM Program. Additionally, administrators can effortlessly summarize the data by downloading all information input by students.

5. Deployment
   During the deployment phase, the installation of website will be carried out by paid hosting. The website will distribute to end-users, include admin and student in Faculty of Information Technology.
6. Deployment
   In the last phase, the author as a developer is responsible for addressing any errors or bugs that might not have been identified during the testing phase. Additionally, the author can upgrade features as per the faculty needs.

4. CONCLUSIONS AND RECOMMENDATIONS

Based on the solution of the new IBIKFTI Website, it serves as a platform for faculty in university to collect student's information through their participated at MBKM Program and compile it into archival documents for the faculty. The aspiration is for this web-based application to undergo further development, assisting faculties that continue to face difficulties in managing MBKM

Program data. The implementation of the classification feature in IBIKFTI's website has demonstrated its ability to assist administrators in summarizing data based on students and their selected MBKM Program. The system is user-friendly for both administrators and students when reporting information across multiple categories.

Acknowledgement

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REFERENCE

[1] Lisdiantini, N., Azis, A., Syafitri, M, E. & Thousani, F, H. (2022). "Analisis Efektifitas Program Magang untuk Sinkronisasi Link and Match Perguruan Tinggi dengan Dunia Industri (Studi terhadap Program Magang Mahasiswa Program Studi Administrasi Bisnis Politeknik Negeri Madiun ". ECOBISMA, 9. 2, 22-31.

[2] Sopiansyah, D., Masruroh, S., Zaqiah, Q. & Erihadiana, M. (2021). "Konsep dan Implementasi Kurikulum MBKM (Merdeka Belajar Kampus Merdeka)". Jurnal Pajar, 6. 3, 34-41.

[3] Suwanti, V., Suastika, I, K., Ferdiani, D, R. & Harianto, W. (2022). "Analisis Dampak Implementasi program MBKM Kampus Mengajar Pada Persepsi Mahasiswa". Jurnal Pajar, 6. 3, 814.

[4] Samsudin, S., Nurhalizah, N. & Fadilah, U. (2022). "Sistem Informasi Pendaftaran Magang Dinas Pemuda Dan Olahraga Provinsi Sumatera Utara". JTEKSIS, 4. 2, 324-332.

[5] Yulianto, Hery, D. & Firdaus, B, R. (2021). "Perancangan Sistem Informasi Monitoring Magang". *Indonesian Journal on Information Systems*, 6. 2, 130-136.

[6] Ramadhani, D. & Pandu, P, P. (2021). "Perancangan Pendaftaran dan Seleksi Magang Kerja di Dinas Komunikasi Informatika dan Statistik Provinsi Riau". Jurnal Teknik Komputer Informatika Network, 11. 1, 28-31.

[7] Ilham, M. & Belluano, L, L, P. (2022). "Sistem Informasi Magang Bersertifikat Berbasis Web". IJODAS, 2. 2, 69-76.

[8] Prihandoko, B. & Gustalika, A, M. (2023). "Perancangan Sistem Pendaftaran PKL Berbasis website Menggunakan Metode prototype". JATI (Jurnal Mahasiswa Teknik Informatika), 7. 1, 135-144.

[9] Putri, A., Arisandi, D. & Sutrisno, T. (2023). "Sistem Informasi unit Kegiatan Mahasiswa (UKM) Universitas Tarumanagara Berbasis web". Jurnal Ilmu Komputer dan Sistem Informasi, 11. 1.

[10] Silhavy, R. (2020). "*Intelligent Algorithms in Software Engineering: Proceedings of the 9th computer science on-line conference 2020*". Springer.