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Submission date: 05-Jul-2025 04:47AM (UTC-0400)

Submission ID: 2689151212

File name: 207_-_revisi.pdf (268.06K)

Word count: 3330

Character count: 20523

Website Design For The Bachelor Of Informatics Engineering Study Program (S1) Using CodeIgniter Framework (Case Study At One Of The Colleges Of Informatics And Computer Management In Bandung City)

ABSTRACT

In the age of swift advancements in information technology, websites have emerged as a highly effective and efficient medium for delivering information broadly, at any time and from any location. This work is to develop a dedicated website for the Undergraduate Informatics Engineering Work Programme (S1) at the College of Informatics and Computer Management in Bandung City. This website aims to serve as an online information medium that can supplement information systems that have thus far relied solely on instant messaging programs like WhatsApp. The use of WhatsApp for disseminating information, particularly in the form of photographs or documents, often leads to issues such as message congestion, loss of critical data, and disorganization in information management. Consequently, the creation of this website is anticipated to provide a solution for presenting information in a more organized, structured, and accessible manner to the entire academic community of the study program. This study employs Descriptive Analysis to determine user demands comprehensively. The system development process employs the Agile methodology, facilitating incremental and adaptable development in response to evolving requirements. System modeling utilizes the Unified Modeling Language (UML) to depict the system workflow visually. The website is developed using the PHP programming language and the CodeIgniter framework, recognized for its lightweight and rapid capabilities in online application development. The utilized database is MySQL, which is proficient in storing and managing data systematically. To guarantee system functionality, testing was conducted using the Black Box Testing method, which emphasizes evaluating input and output without scrutinizing the program code in depth.

The outcomes of the design and implementation of this website demonstrate that the system can deliver organized information services, is user-friendly, and facilitates communication requirements and the documentation of academic data within the context of the Informatics Engineering Study Programme. This website effectively transcends the constraints of prior communication media, serving as an official conduit for disseminating accurate information.

Keywords: Website, Informatics Engineering Study Program (S1), CodeIgniter Framework, MySQL

INTRODUCTION

The rapid advancement of information and communication technology in today's globalized era has profoundly transformed human activities,

interactions, and the way information is acquired. The Internet has become a vital component in various aspects of society, including education, commerce, governance, and social interactions. The Internet serves not only as a platform for global communication but also as a medium for the rapid, efficient, and accurate transmission and reception of information. In this context, information technology, particularly websites, serves as a pertinent solution to address the issues posed by increasingly complicated information requirements. Websites provide convenient access to information at any time and from any location, as long as a reliable internet connection is available. With minimal effort, individuals can obtain diverse data, information, and services without constraints of geography or time. (Jannah, Marpaung, Nababan, Banuari, Amalia & Sekiawan, 2025; Nugroho, Latief, Lestari & Machfudiyanto, 2023)

The necessity for a web-based information system is becoming increasingly imperative as educational institutions must enhance transparency, responsiveness, and efficiency in disseminating information to the entire academic community. This condition is particularly applicable to universities offering information technology education, such as the College of Informatics and Computer Management (STMIK) in Bandung City. This higher education institution, specializing in information technology and management, bears significant responsibility for the implementation and advancement of

information technology in its operational and academic endeavors. The Undergraduate Informatics Engineering Study Programme (S1) is a prominent academic program on campus, necessitating the effective communication of various academic, administrative, and extracurricular activities to students, faculty, and other stakeholders. (Ramadaniah, Fitra, Satria & Zidane, 2022; Artikasari & Donoriyanto, 2023)

Nevertheless, the actual situation in the field indicates that the dissemination of information related to the S1 Informatics Engineering study program continues to occur regularly via instant messaging services, such as WhatsApp. This medium is undeniably popular and functional, although it possesses certain constraints in information management. Transmitting information through WhatsApp, such as text, photos, or documents, frequently results in an accumulation of messages, complicating the retrieval of essential information. Moreover, transmitted files may be lost, erased, or overwritten by other files. Consequently, the data retrieval process becomes inefficient, complicating access for users, particularly when the required material has been disseminated for an extended period. This scenario is highly suboptimal for an academic setting that necessitates expediency, precision, and consistency in information handling. (Hidayat, Satuti, Senses, Elisabeth & Hasani, 2024; Jánki & Bilicki, 2023)

A solution is required that offers more effective, efficient, organized, and readily accessible information media. A highly effective solution is to create a dedicated website for the S1 Informatics Engineering Study Programme. This website serves as both a publication medium and a repository for documents, announcements, activity schedules, and a wide range of academic content. Information can be systematically categorized, stored in a structured database, and readily accessed by users via the website, eliminating the need for laborious human searches. Moreover, the website can enhance the image and professionalism of the study program, as its presence signifies the institution's dedication to optimal technological utilization. (Putri, 2024; Septiawan, Sakethi & Andrian, 2022)

The design of this website is based on an understanding of the needs of users, including students, lecturers, and study program managers. Therefore, the initial development process was carried out using the Descriptive Analysis method approach to explore information related to the needs, constraints, and expectations of users of the information system to be built. The information obtained from this analysis process serves as the basis for determining the features that a website must possess, such as academic information menus, announcements, document downloads, lecturer contacts, and other relevant elements. Additionally, the user interface design has been adjusted to be easy to use for various user

groups, including both those familiar with technology and those new to it.

In the system development process, the Agile method is used because it offers an iterative and flexible approach to building applications. Agile allows developers to divide the work process into several stages (sprints) and conduct periodic evaluations and revisions. This condition is crucial to ensure that every user's needs are properly accommodated and that the system built is genuinely in line with expectations. To support the system design, modeling is based on the Unified Modeling Language (UML), which includes use case diagrams, activity diagrams, and class diagrams. This modeling helps developers to describe the system workflow visually and systematically. (Prasetia, Junaedi & Sianipar, 2022; Cavalcante, Guerino, Leal, Balancieri & Galdamez, 2024)

This website is built using the PHP programming language with the CodeIgniter framework. The selection of CodeIgniter as a development framework is based on several key considerations, including its lightweight and fast nature, comprehensive documentation, and support for structured web application development using the Model-View-Controller (MVC) design pattern. By using CodeIgniter, the coding process becomes more efficient and easier to maintain in the future. For data storage, the MySQL database is utilized, offering advantages in relational data management and compatibility with PHP. MySQL allows data to be

stored in a structured manner and can be accessed with flexible queries.

After the development process is complete, system testing is conducted to ensure that all functions operate correctly and to the specifications. The method used in testing is Black Box Testing, a testing approach that focuses on input and output functions without examining the internal structure of the program code. Testing is conducted on every feature on the website, including the login feature, uploading and downloading documents, searching for information, and sending messages. The test results indicate that the system operates as expected and delivers a satisfactory user experience.

The importance of a website for the Informatics Engineering Study Program lies not only in its ability to disseminate information but also in forming a modern and reliable communication and data management system. In the long term, this website can be further developed into a more comprehensive academic information system with the addition of features such as course registration, KRS filing, final assignment submission, online consultation, and others. This development must, of course, be adjusted to the readiness of the institution's human resources and technological infrastructure.

With a professionally built study program website, students no longer have difficulty accessing important information related to their

academic activities. Lecturers and study program managers can also convey information more systematically and in a documented manner, and it can be traced at any time. This website is envisioned as one form of academic service innovation that supports the teaching and learning process, enhancing the quality of service in the higher education environment. Additionally, the existence of a website enhances the credibility of the study program in the eyes of the public and prospective students, as it reflects the seriousness of establishing a modern and transparent information system.

Based on the description above, the design and development of a website for the Undergraduate Informatics Engineering Study Program (S1) at one of the Colleges of Informatics and Computer Management in Bandung City is essential and urgent. This condition is not only to answer problems in delivering information but also to support digital transformation in the world of higher education. This website is intended to serve as the initial foundation for the development of a broader information system in the future. With the right development approach and appropriate technology, this website can make a significant contribution to enhancing the quality of academic services and managing study program information.

METHOD

This study employs a descriptive methodology to elucidate the design and development process of the Informatics Engineering Study Programme website (S1). The descriptive method was selected to comprehensively analyze user requirements, current issues, and the development process of a web-based solution that addresses those demands. The study commenced with a requirements analysis conducted by direct observation of the existing information system, specifically the utilization of WhatsApp as the primary medium for disseminating academic material. Furthermore, informal interviews were conducted with the Head of the Study Programme and numerous students to gather supplementary information regarding feature requirements and the challenges frequently encountered in obtaining information.

The Agile Development technique is employed as a software development methodology in the system development process. Agile was selected for its capacity to offer flexibility and facilitate the adaptation to evolving user requirements throughout the development process. This methodology facilitates iterative and incremental development, enabling each component of the system to be progressively designed, tested, and enhanced. Each iteration encompasses the phases of planning, designing, coding, testing, and evaluation, which are subsequently carried forward into the following iteration until the system adequately fulfills user requirements.

The system design utilized the Unified Modeling Language (UML) to represent the system's flow and structure visually. UML diagrams employed include case diagrams to delineate user interactions with the system, activity diagrams to elucidate process flows, and class diagrams to represent data structures and their interrelations. The website was developed on the PHP programming language alongside the CodeIgniter framework, which employs the Model-View-Controller (MVC) architectural pattern. CodeIgniter was selected because of its lightweight, rapid, and comprehensible architecture, as well as its facilitation of modular web application development. This system is connected to the MySQL database, providing a structured and efficient data storage solution. Upon completion of the development phase, testing is conducted via the Black Box Testing method, which emphasizes evaluating the primary functionality of the system based on input and output generated without examining the program code. Testing is conducted to verify that each feature operates as intended and that the system functions effectively, delivering an optimal user experience.

RESULTS and DISCUSSION

The outcome of this study is a website designed to facilitate the dissemination of academic information for the Undergraduate Informatics Engineering Study Programme (S1) at the

College of Informatics and Computer Management (STMIK) in Bandung City. The constructed website delivers academic information in an organized fashion, is readily accessible, and can be utilized by the entire academic community at any time and from any location. The website building process commences with the user needs analysis phase, indicating that the prior information dissemination methods were constrained, as they solely depended on the WhatsApp messaging service. This medium often leads to message accumulation, challenges in document retrieval, and the potential loss of critical information. This issue is the primary impetus for creating a website as a more effective and efficient alternative approach.

The user needs analysis yielded several key features deemed essential, including a homepage with general information about the study program, a news and announcements page, an academic activity agenda page, a document download feature for items such as the academic guide, syllabus, and submission form, and a contact page enabling students or external parties to reach the study program manager directly. These features are constructed utilizing a modular approach with the CodeIgniter framework, which employs the Model-View-Controller (MVC) paradigm, facilitating the separation of programming logic from interface presentation, hence rendering the development process more organized and manageable.

The website's design prioritizes user interface (UI) and user experience (UX) elements that are straightforward yet informative. Responsive design is implemented to ensure that the website display adapts to the screen size of diverse devices, including laptops, tablets, and smartphones. This strategy ensures that people may effortlessly access information on mobile devices. The colors and graphic elements are modified to align with the campus identity, conveying professionalism and a robust academic image.

The system implementation involves integrating the MySQL database for data storage. The database architecture is optimized for the efficient management of document data, news, activity schedules, and user information. The primary tables utilized in the system are the user table, document table, agenda table, and news table. The utilization of inter-table links enables the system to present information dynamically and cohesively, facilitating data management and updates by program administrators.

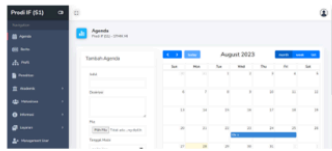
1. Login Page View

Figure 1. Login Page View



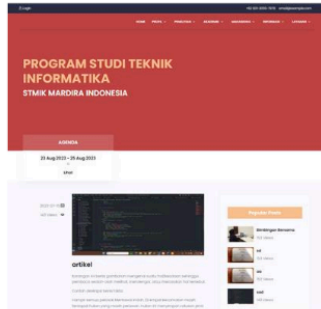
2. Admin Agenda Data Page View

Figure 2. Admin Agenda Data Page View



3. Website Page View

Figure 3. Website Page View



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Nevertheless, numerous significant observations can be incorporated to advance our understanding further. The system currently lacks an analytical dashboard option for administrators that would furnish website usage statistics, including visitor counts, commonly downloaded documents, and the most accessed content. This functionality is beneficial for assessment and future strategic planning. The existing login system is restricted to administrative access rights; however, it would be advantageous for the website to evolve into a more personalized login system for students and lecturers, enabling them to access additional features such as bookmark saving, commenting, and notifications for the latest updates.

Furthermore, the security dimension requires enhancement through the incorporation of a captcha feature in the login and contact forms to mitigate spam and brute force assaults. Consistent data backup and the adoption of HTTPS are essential considerations for ensuring long-term information security.

The creation of the Informatics Engineering Study Programme website has yielded satisfying outcomes and effectively addressed the primary issues in disseminating academic material. This website serves as both an informational platform and a component of the digital transformation initiative within higher education. Through effective management and consistent system maintenance, this website can be further enhanced and adapted to meet increasingly complicated future requirements.

The findings of this study may serve as a reference for other academic programs facing similar issues, particularly in the distribution of academic materials using unstructured media. The system development methodology employed in this study has demonstrated efficacy and can be repeated with specific modifications according to the circumstances of each institution.

Consequently, the website is designed to address present requirements while also serving as the foundational basis for the future creation of more sophisticated and integrated information systems. The presence of a web-based information system at the program level is crucial for fostering a transparent, professional, and technologically flexible academic environment.

CONCLUSION

The research and development findings indicate that the website design for the Undergraduate Informatics Engineering Study Programme (S1)

at a college in Bandung City has effectively addressed the issue of information dissemination, which previously relied solely on instant messaging applications like WhatsApp. This medium exhibits numerous limitations, including message buildup, challenges in document retrieval, and the risk of data loss, which ultimately impedes effective communication between the study program and its pupils. The creation of a website utilizing the CodeIgniter framework facilitates a more organized, documented, and readily available dissemination of academic content for all users at any time and from any location.

The website development process was executed methodically utilizing the Agile methodology, which facilitates adaptable modifications to user requirements during the iterative phase. A comprehensive needs analysis effectively identified the essential components required, including academic agenda details, news releases, critical papers, and connections to the study program. All functionalities were developed using the PHP programming language and MySQL database and subsequently tested through the Black Box Testing approach. This approach demonstrated that all functions operated effectively and aligned with the intended objectives.

This website enhances information distribution while also elevating the professionalism and legitimacy of the study program by providing digital and contemporary

information services. The presence of digital archives enhances the processes of reporting and scholarly recording. This website features a dynamic and user-friendly interface that facilitates information access for students and enables study program managers to transmit information systematically and efficiently.

The developed website is anticipated to serve as an official information medium, facilitating academic and administrative operations within the S1 Informatics Engineering Study Programme. In the future, this system can be further enhanced with features such as personal user login, usage statistics, alerting systems, and security upgrades to maximize its benefits and align with the evolving technological landscape.

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