

Selangor Matriculation College Information Announcement and Notification System (SMC-IANS)

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Abstract: All matriculation students are required to engage in the co-curricular programme, where they will have the opportunity to organize co-curricular events in groups. Programmes, events, or co-curricular activities organized will be advertised through social media platforms like Telegram and WhatsApp to draw participants. Study found that the current method of delivering programme information, events, or extracurricular activities is less effective due to problems such as the information being disseminated through various applications and not all channels or chat groups receiving it. Therefore, the main objective of the development of Selangor Matriculation College Information Announcement and Notification System (SMC-IANS), which is web-based system, is to facilitate the dissemination of any programme information, events, or co-curricular activities to all SMC students. As a result of the development of SMC-IANS, students will find it easier to find and access programme information, events, or extracurricular activities. In addition, this system can give them the opportunity to assist one another via the provided discussion forum page. Furthermore, the system is applicable to any student-based organization such as Polytechnics, universities, private organizations, or small organizations. This web-based system can be developed further into an application that is easier to use and accessible at any time. SMC-IANS is equipped with security features like password validation, to ensure the security of the user's account, 'password hashing' using the BCrypt algorithm, and HTTPS to guard against unauthorized access. Also, based on the Technology Readiness Level (TRL), SMC-IANS is now at TRL 6, where the system has been demonstrated with the help of SMC students in a relevant environment and has the potential to meet the minimum requirements and specifications for its intended use. The next step is being arranged to move forward and reach the next level of TRL.

Keywords: Discussion forum; Information System; Notification; Posting and Comments, BCrypt hashing; HTTPS



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1. INTRODUCTION

Scholars or students are valuable resources that will guide the nation in a better direction and aid in advancing the nation's future development. The term "student" symbolizes the terminology for the mindset of young people who attempt to adequately prepare themselves for the obstacles and challenges that lie ahead in order to achieve better lives. In line with this, many students are currently actively participating in a variety of activities, events, or programmes put on by the institution, university, or external parties. This is so they can continue to build networks not just with their peers,

but also with different parties and communities, perfect their talents, and skills, and add knowledge in a certain field.

According to the official website of the Ministry of Education Malaysia (KPM), the matriculation programme was founded in 1998 with the intention of assisting Bumiputera students in preparing themselves to continue their studies to the first-degree level (Ramli, n.d.). Like other matriculation institutions, all students at Selangor Matriculation College (SMC) are required to participate in the co-curricular programme. Students are given the opportunity to organize co-curricular activities in groups. Such instruction and training can open up new opportunities for students to gain experience, particularly in project management. Also, it enhances knowledge and soft skills that are applicable in daily life, particularly at work.

Based on the questionnaire's findings, the majority of respondents (34.3%) agreed that the current system used to send information through social media platforms was ineffective. One of the reasons is, the group chat, where the information is exchanged or shared, might not be available to all pupils, and the information is being disseminated through various of different applications. Additionally, it is stated that there is a lack of interaction between students and the SMC co-curricular units. Hence, they need a system that capable of generating notifications to inform them of any new programmes' information.

In order to meet the demands, facilitate all matters in terms of delivering information to students, and be able to address the issues faced, an official medium or platform must be developed. Therefore, the main objective of the development of the Selangor Matriculation College Information Announcement and Notification System (SMC-IANS), which is a web-based system, is to facilitate the dissemination of any programmes information, events, or co-curricular activities to all SMC students and provide them a two-way communication with the organizer. The development of this system follows the Rapid Application Development (RAD) methodology where, it involves four phases namely, requirements planning, design, construction, and cutover. SMC-IANS is developed using a variety of programming languages, including HTML, PHP, and CSS. As a result, students will find it easier to search and access programme information, events, or extracurricular activities. In addition, this system can give them the opportunity to assist one another via the provided discussion forum page.

This paper gives a general overview of the system, outlining its salient characteristics and features as well as the advantages it delivers to the intended audience. We also discuss the development process, the difficulties we ran into, and the lessons we gained in an effort to share our knowledge and expertise with a larger group of web developers and practitioners. This system is also applicable to any other student-based organization such as Polytechnics, universities, private organizations, or small organizations. Our approach has the potential to aid the SMC co-curricular units to disseminate the programmes' information to all SMC students.

2. METHOD & MATERIAL

The system development methodology is a standard process followed in an organization to carry out all the steps necessary to analyse, design, implement, and maintain an information system. According to Polit and Beck (2004), a methodology is related to techniques for collecting, organizing, and analysing data (Business Bliss Consultants FZE, 2018). Rapid Application Development (RAD), which was developed in 1980, was used to develop the SMC-IANS. This methodology was chosen because it can shorten the time typically needed to develop and implement an information system (Khair & Almadany, 2022). Figure 1 shows the RAD methodology and its phases.

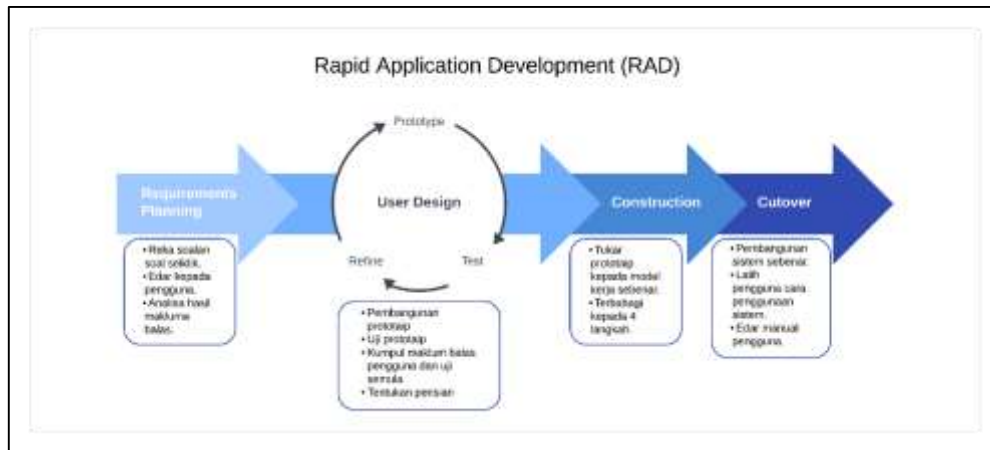


Figure 1. Phases Involved in RAD Methodology.

The first phase is requirements planning. In this stage, the objectives, and all of the requirements needed to develop the system are identified. Hence, a survey was designed and distributed to the targeted users which are SMC students to identify the current system or method being used and knows the weakness and effectiveness of the current method are used. Additionally, to ascertain the need for the construction of a new system and collect their suggestions that can be implemented into the system.

Next phase is the design phase, where the web design is built based on the system scope, as well as all the processes and tasks tailored to each user's scope are also defined. This phase defines processes and tasks tailored to each user's scope. For instance, the co-curricular unit, which serves as the administrator, will be responsible for enrolling each user who uses the system, uploading posts, and also verifying the uploaded posts by other users. Admins will have the authority to manage the system entirely. On the user module, they are able to perform tasks such as changing their own password, updating their personal information, and interacting with other users and the organizers.

The construction phase involves the actual development of the system, where this phase is divided into several steps namely, rapid development setup which ensures that all software that will be used to develop the system is ready, program and application development, where the system will be built using HTML, PHP, CSS and other languages. The third step is coding, where during the process, all the output results will be displayed on the web browser application. Lastly, is system testing. In this step, the system will be thoroughly tested to ensure whether the system is able to function as intended to and whether the objectives is achieved or not.

The last phase is cutover. This phase involves implementing and launching a usable system for users. The targeted audience will receive user manuals to ensure the system is used properly. Until users are happy with the system, testing, enhancement, and correction will continue.

3. FINDINGS

The SMC-ANS aimed to design a web system to ease the dissemination of programmes, events, and co-curricular activities at SMC and provide two-way communication which the current system in used lack of. At the early stage, a survey was designed and distributed to the SMC students to identify the current system being used, find its weaknesses and effectiveness, and ascertain the need for a new system.

3.1 Survey Result

A survey was conducted during the early stage to gather information about the current system used for the dissemination of information on programmes, events, or extracurricular activities to SMC students. The survey also aims to learn how students know about events, activities, and programmes as well as the shortcomings and efficiency of the current method or system. Also, it was carried out to determine the need for a new system.

The result shows that there are certain positive feedback responses that can be taken into consideration to aid in the system's development. Figure 2 displays a bar graph of the analysis of responses to the survey questions from respondents. Scales 1 and 5 are described as "extremely unsuccessful" and "highly effective," respectively. According to the result, the majority of respondents (35.1%) stated that the existing system was inefficient, and only 2.7% stated as highly effective. The failure of the current method use makes it possible to assist the development of SMC-IANS.



Figure 2. Survey Result.

Respondents cited many issues about the current method in use such as how challenging it was for them to engage with the organisers, how challenging it was to advertise the organised event, how there was no prompted notification, and other issues. In addition, the survey's findings showed that everyone agreed for a new system to be built to address the issues they are facing.

3.2 Interface Design

The process of deciding how the system will interact with external entities, such as administrators and users, is known as the interface design. It outlines the system's functioning and the degree of access that each entity is granted. Figure 3 shows the login interface page. The login page is the same for both the user module and the admin module.



Figure 3. Login Interface.

Users are required to enter the correct id and password before proceeding using the system. An error message will be displayed to notify them if the id or password is incorrectly entered. Figure 4 shows the dashboard page for the user module. This is the first-page user will see after successful login.



Figure 4. Dashboard Page for User Module.

Users will interact with each other on the provided section on a page. Figure 5 illustrates an example of the interaction happening within a post. The user who posted the topic will receive a notification for every comment left on the page by other users. Other users can also mention each other and the mentioned account will receive a notification that contains the link to that certain topic where they were mentioned.



Figure 5. Comment Section.

4. DISCUSSION

The SMC-ANS system has been tested by a group of testers from the targeted audience and their feedback is collected to improve the system. The system is web-based and can be accessed from any device with an internet connection. SMC-ANS contains two primary modules, the administrator module, and the user module.

The user admin module is specifically designed for the co-curricular unit to manage the system. Admin has the authority to approve or delete any post submitted by users, create a new feed, register new users, also manage the discussion page. On the other hand, the user module is designed for SMC students where they are able to access programme information, events, or extracurricular activities, submit posts, edit or delete their own posts, and interact with other users within the system. The system also provides notifications to inform users of any new information or events.

During the testing phase with the targeted audience, the system was found to achieve all the objectives defined. Although there are problems that have been identified during the testing phase, all feedback sent has been reviewed and the system has been improved. The feedback form was to gain input on the system's effectiveness, find issues or errors, measure the degree of user satisfaction, as well as suggestions for future system improvement. Although the answer column has a scale from 1 to 5, the majority of respondents rate their replies between 4 (Agree) and 5 (Totally Agree). Table 1 summarizes the results of the questionnaire.

Table 1. Summary of User Feedback on SMC-IANS System.

Items	Agree (%)	Totally Agree (%)
The system interface is easy to understand	11.8	88.2
Do you find it easy to complete your tasks when using the system? (E.g., upload a post, write a comment, delete a post, update information)	35.3	64.7
Is this system capable of helping in the process of disseminating program information, events or co-curricular activities?	23.5	76.5
Does this system help solve problems in providing and facilitating two-way communication between students and broadcasters?	35.3	64.7
How satisfied are you with the developed system?	64.7	35.3
Items	Yes (%)	No (%)
Do you encounter any errors or bugs in the system while using it?	11.8	88.2
Is this system meet your needs and expectations?	94.1	5.9

The majority of respondents (88.2%) totally agreed that the system interface is easy to understand. 64.7% of respondents totally agreed that it is easy for them to perform a basic function such as uploading posts, writing comments, and deleting posts while using the system. Moreover, it is proven that the system is effective in solving problems related to communication between students and broadcasters, allowing both parties to communicate and exchange information and ideas. Furthermore, only 11.8% of respondents stated that they encountered errors while using the system during the testing phase. Overall, the majority of respondents (94.1%) agreed that the system has met their needs and expectations.

After comprehensive evaluation and analysis, it can be concluded that the system has successfully achieved its intended goals, met the expectations of its users, and help to solve the defined problems, thereby proving to be an efficient solution. Undoubtedly, the system still has space for improvement in the coming years.

5. CONCLUSION

The Selangor Matriculation College Information Announcement and Notification System (SMC-IANS) was developed to facilitate the dissemination of any programmes information, events, or extracurricular activities to all SMC students and provide them a two-way communication with the organizers. The system was developed using Rapid Application Development (RAD) methodology and a variety of programming languages, including HTML, PHP, and CSS. The system is designed to be user-friendly and easy to understand, enabling students to navigate easily. The system has several features that enable users to perform various tasks, such as viewing post information, writing comments, and managing it. The system was tested by SMC students who volunteered to participate

in the testing phase to ensure that it was functioning correctly and met the requirements. The results showed that the system was easy to use, achieve its intended objectives and all features were working correctly. Overall, the SMC-IANS has the potential to aid in disseminating programmes' information to all SMC students. Additionally, this system is also applicable to any other student-based organization such as Polytechnics, universities, private organizations, or small organizations.

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