



## Building Bridges: Universitas Multimedia Nusantara's Experience in Strengthening Academic Relationships through a Social Community Media Approach

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### Abstract

Universitas Multimedia Nusantara has thousands of academicians and several academic or non-academic organizations. Some of these things allow the potential for increased social relationship connections between the academic community and the intensity of receiving and disseminating information, especially for students. Through a survey of students, there are examples of confirmed problems regarding the receipt and dissemination of information such as the lack of exposure of student work, the location of wall magazines that are difficult to find, information on student emails that are less relevant, time-consuming searches for coursework respondents, and the number of social media accounts of organizations that must be searched on different social media platforms to get information. Therefore, the design and development of a social community media website utilizing the Rapid Application Development method, a rapid prototype system development model with the stages of planning, design workshop, and implementation. The focus of the research is the backend system. The backend system design utilizes draw.io to create flowcharts and supabase schema for entity relationship diagrams, while the system development utilizes javascript with next js as the system development tool while system development utilizes javascript with next js as a framework and supabase as the system database. Backend media website backend of the social community media website was successfully designed and built and received User Acceptance Testing results with an acceptance rate of 88.08% for the perceive usefulness and 88.67% for the perceive satisfaction variable, which means that users strongly agree that the function of the social community media website system has fulfilled the two elements of the variable.

**Keywords:** Rapid Application Development, social community media website, User Acceptance Testing, Universitas Multimedia Nusantara

### 1. INTRODUCTION

Universitas Multimedia Nusantara (UMN) comprises four faculties that provide a diverse range of academic programs. The academic institution comprises four distinct faculties: the Faculty of Engineering and Informatics, the Faculty of Business, the Faculty of Art and Design, and the Faculty of Communication. The faculty of Universitas Multimedia Nusantara is reported to have a student population of roughly 8,415 [1]. The faculties of Universitas Multimedia Nusantara



also encompass a variety of academic and non-academic groups, including student associations and student activity units. The students enrolled at Universitas Multimedia Nusantara actively engage in various campus activities that require interpersonal connections. These activities include showcasing their coursework for fellow students to appreciate, staying informed about events organized by campus organizations, and offering assistance to individuals in order to fulfill their academic and non-academic requirements.

Universitas Multimedia Nusantara students utilize various communication channels, such as student e-mails, event displays, wall magazines, and the organization's social networking platforms, to both receive and disseminate information pertaining to organizational activities, events, and work exhibitions. Students from Universitas Multimedia Nusantara also utilize chat rooms on social media platforms as a means of acquiring knowledge and disseminating it to other persons or organizations. The difficulty in locating wall magazines, the inclusion of irrelevant student email information, and the need to search through numerous social media accounts can impede the dissemination of student work exhibitions and information regarding organizational activities or events [2]. Furthermore, the process of exchanging and acquiring knowledge among individuals or cohorts of students through chat rooms on diverse social media platforms can be a laborious task and may provide difficulties in cases where students lack familiarity with their peers [3], [4]. The present discourse aims to highlight certain challenges pertaining to the reception and dissemination of information within the context of the media platform employed by Universitas Multimedia Nusantara. To gain a deeper understanding of the social ties among students and the methods employed for information reception and dissemination within Universitas Multimedia Nusantara, an initial investigation was conducted. This involved the distribution of a survey to students of the institution, utilizing the Google Forms platform. The subsequent passage presents a concise overview of the discovered results.

Most students confirmed their acquaintance with over 10 students from diverse academic cohorts and faculties, according to the poll. The study's 80.66% result shows that Universitas Multimedia Nusantara students are social. The poll found that students who responded positively knew little about their peers' work due to limited exposure. Despite claiming to know over 10 students from different faculties and cohorts, the overall survey score of 73% suggests they know little about their peers' academic endeavours. The survey found that student participants were undecided about attending peer academic exhibitions or campus events. The total survey calculation score of 56.66% suggests a paucity of campus event and student work information.

Survey results showed that student participants agreed that student work should be more visible. A survey score of 89% was calculated. The final survey calculation score of 90% shows that Universitas Multimedia Nusantara students agree that

the student e-mail system efficiently receives academic and non-academic material. After reviewing student emails, it was found that they only discuss relevant topics. Students prefer not to read everything in their emails, as shown by the survey's 92.33% score.

Student participants agreed that finding Universitas Multimedia Nusantara wall publications was difficult. The survey computation's final score of 71.66% shows this. The survey's final score of 44.66% showed that student respondents were undecided about reading Universitas Multimedia Nusantara's wall magazine. The poll respondents agreed that digital platforms are easier to use than posters or booklets for information. The final survey computation score of 90% proves this. The study found that 83.66% of student respondents agreed that they do not follow all Universitas Multimedia Nusantara organisation social media pages. According to the poll, most students said that they required the content for research, coursework, projects, and professional commitments. The final survey score of 88.33% supports this.

The survey participants agreed that finding respondents through repeated messaging via individual or group channels is time-consuming. The final survey computation score of 83.33% shows this. The poll computation showed that student respondents agreed 81.33%. This agreement was that student activity units, organisations, study programmes, and student work can be easily accessed through a single platform rather than several media or platforms. Students at Universitas Multimedia Nusantara strongly support using student email for communication. The final survey computation result of 90.66% supports this.

Based on the preliminary study's findings, it is suggested that the research objectives include the implementation of a social community media system tailored to the requirements of the Universitas Multimedia Nusantara community. Additionally, the measurement of user satisfaction can serve as a benchmark for evaluating the effectiveness of the system's implementation. Social media is comprised of a set of software applications that facilitate the gathering, sharing, communication, and collaborative activities of individuals and communities. The scope of the design and development efforts for the social media platform will be confined to the backend components of the community website. The use of the Rapid Application Development (RAD) software process paradigm for design and development is driven by its emphasis on short development cycles [5], [6]. The RAD approach is deemed suitable in light of the limited duration available for conducting research. The present study involves the collection of data from users to assess the degree of user acceptance towards the application. This assessment will be conducted using the user acceptance testing (UAT) method [7], which aligns with the Rapid Application Development (RAD) approach that consistently incorporates user involvement throughout the design and development phases [8].

## 2. MATERIAL AND METHODS

### 2.1. Survey Population and Sampling Techniques

The population is a conceptual framework including a group of individuals or entities with specific features and attributes, as identified by researchers for the purpose of conducting a study and drawing subsequent findings [9]. Alternatively, a sample refers to a subset of population characteristics [10]. In previous studies, researchers utilized the Slovin formula to determine the appropriate sample size required for data gathering. According to the Slovin formula, the required sample size for this investigation is 98 respondents. The Slovin formula, which is utilized for determining study sample sizes, is presented as follows [11], [12].

$$n = \frac{N}{1 + N(e)^2} \quad (1)$$

Description:

n = Number of respondent samples

N = Total population = 8,415

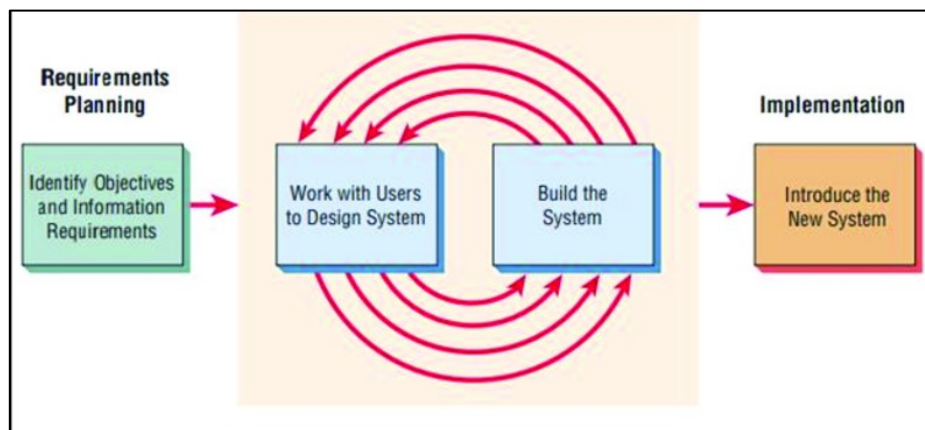
e = The percentage of allowance for accuracy of sampling errors that can be tolerated is e = 0.1 (10%).

This research encompassed the participation of students currently enrolled at Universitas Multimedia Nusantara who were actively engaged in their academic pursuits. The data collection process consisted of two distinct stages: an initial survey aimed at gathering needs for planning purposes, followed by a satisfaction level survey conducted using the User Acceptance Testing approach [13], [14]. There is a disparity in the sample sizes between the two stages of data collection. Specifically, 60 samples were gathered from UMN students who participated in the survey for planning purposes, whereas 43 samples were acquired from Universitas Multimedia Nusantara students who participated in the survey to assess their satisfaction levels. Despite the inclusion of students from various faculties and cohorts, the sample size utilized in the study failed to meet the minimum requirement as determined by the Slovin formula. The reason for this occurrence is that the participants were tardy and failed to provide responses throughout the designated period for survey administration. The researchers delivered questionnaires to students at Universitas Multimedia Nusantara in order to gather data for the study, utilizing the platform of Google Forms.

### 2.2. Methodology

The rapid application development approach, also referred to as RAD, is a strategy for system development that places emphasis on the swift creation of prototypes and the ongoing exchange of feedback between developers and users [15]. This

approach is employed in the development of the backend for a social media website focused on fostering a sense of community. The building of the backend for a social community media website typically commences with the adoption of the Rapid Application Development (RAD) approach [5], [16]. This approach encompasses various stages, including requirements planning, workshop design, and implementation. Subsequently, the research endeavors progress by engaging in the activities of testing, assessment, and report composition. The model depicted in Figure 1 represents the RAD approach, as described by reference [17].



**Figure 1.** RAD Model Workshop

## 1) Requirements Planning

During the requirement planning stage, the identification of all requirements or user demands will take place. Hence, to substantiate the problem that subsequently formed the basis of the research, data collection and analysis were conducted with respondents throughout the requirements planning phase. The survey data was collected using the Google Form platform, and then, the Likert scale formula was employed to analyze the collected data. Attached is a feature mapping table that pertains to the requirements of the social community media system, specifically focusing on the features of Facebook and the necessary features of a social community media website. This table is intended to aid in the interpretation of survey data.

**Table 1.** Feature mapping of social community media system requirements

Social Media Needs for Universitas Multimedia Nusantara's Students	Facebook Features					
	Login	Post	Like	Create Groups	Event Info	Friendship feature
Account verification	v	-	-	-	-	-
Exhibition of works	-	v	-	-	-	-

Social Media Needs for Universitas Multimedia Nusantara's Students	Facebook Features					
	Login	Post	Like	Create Groups	Event Info	Friendship feature
Information reception	-	v	-	v	v	v
Respondent search	-	v	-	-	-	-
Appreciation feature in the form of likes	-	v	v	-	-	-
Broadcast message via student email	-	-	-	-	-	-
Universitas Multimedia Nusantara student exclusivity automation	-	-	-	-	-	-

Table 1 presents the feature mapping of social community media system requirements, indicating that Facebook is capable of meeting various requirements of social community media systems, including account verification, showcasing work, receiving information, searching for respondents, and expressing appreciation through likes. Nevertheless, Facebook fails to meet two specific social community media system requirements, namely the ability to send broadcast messages through student email and the exclusive automated feature limited to Universitas Multimedia Nusantara (UMN) students. Hence, the characteristics of the social community media platform have been formulated and presented in Table 2.

**Table 1.** Features of social community media websites

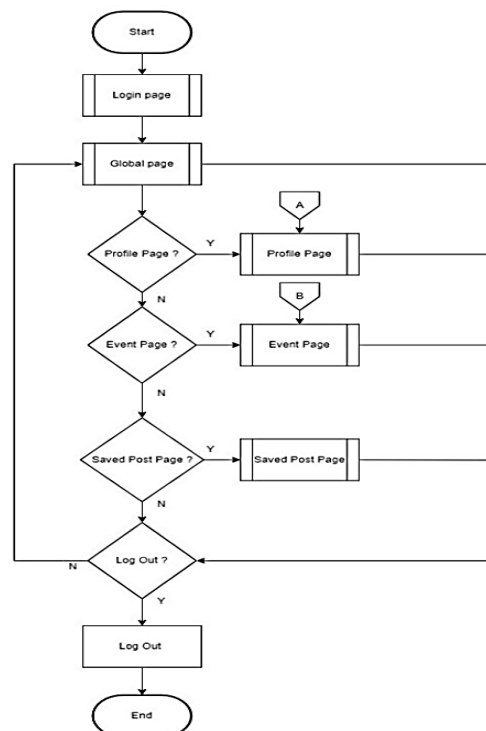
No	Feature
1.	Log-in feature (UMN domain e-mail only)
2.	Post feature (perform uploading process and view uploads)
3.	E-mail Messaging Feature (send messages via e-mail to students privately and broadcast)
4.	Event Information and News Features (uploading event information and viewing event information uploads)
5.	Friendship (following and followers)
6.	Appreciation (like post, comment post, save post and unsave post)

## 2) Workshop Design

During the initial phase of the Workshop, users and analysts collaboratively strategize the system's conceptualization, database plan, and interface plan [8]. Hence, the iterative procedure of deliberating upon the social community media system was conducted on multiple occasions, led by Mr. Wirawan who served as the instigator and overseer of the system. The outcome entailed enhancements to the design of the system flowchart and the elimination of the upload comment functionality. Prior to commencing the iteration process, it was important to undertake the task of building database entity relationship diagrams and flowcharts

in order to facilitate the construction of the system. A total of eight flowcharts were generated during the course of this procedure, consisting of one primary flowchart, seven module flowcharts, and one database relationship entity diagram. A total of eight flowcharts were generated during the course of this procedure, consisting of one primary flowchart, seven module flowcharts, and one database relationship entity diagram. The comprehensibility of the feature arrangement in the header, post, events page, and saved post page will be enhanced. Hence, included herewith are several flowcharts, specifically the primary flowchart, global page flowchart, and profile page flowchart, along with the database relationship entity diagram. These visual representations serve to depict the materials generated during the design workshop phase.

Figure 2 illustrates the fundamental flowchart of the system implemented in the social community media website. The system flow begins when the user initiates the login process on the designated login page. After a successful authentication, the system will automatically display the global page menu as the default sequence of actions. When visitors navigate to the global page menu, they are presented with three supplementary page menu options: the profile page, event page, and saved post page. After the current page menu has been successfully completed, the system flow will return to the global page menu.



**Figure 2.** Main flowchart



The movement of the global page is depicted in Figure 3. The flow commences with the process and resultant of the global page, encompassing four distinct sections: header, upload generation, upload appearance, and right bar. Within the area dedicated to upload creation, users have the option to initiate the uploading process before engaging in the form-filling procedure. This form can be completed with many types of content, including text, photographs, and videos. In addition, the right sidebar is comprised of two distinct subsections, namely the news list and the event list. The news list exhibits the sequential representation of the procedure and outcome of news articles retrieved from the News API. Each item inside the news list is equipped with a clickable feature that enables users to access the original news source on a separate browser page. The flow in the event list showcases the sequential progression and resultant outcomes of event data sourced from the event table within the database system.

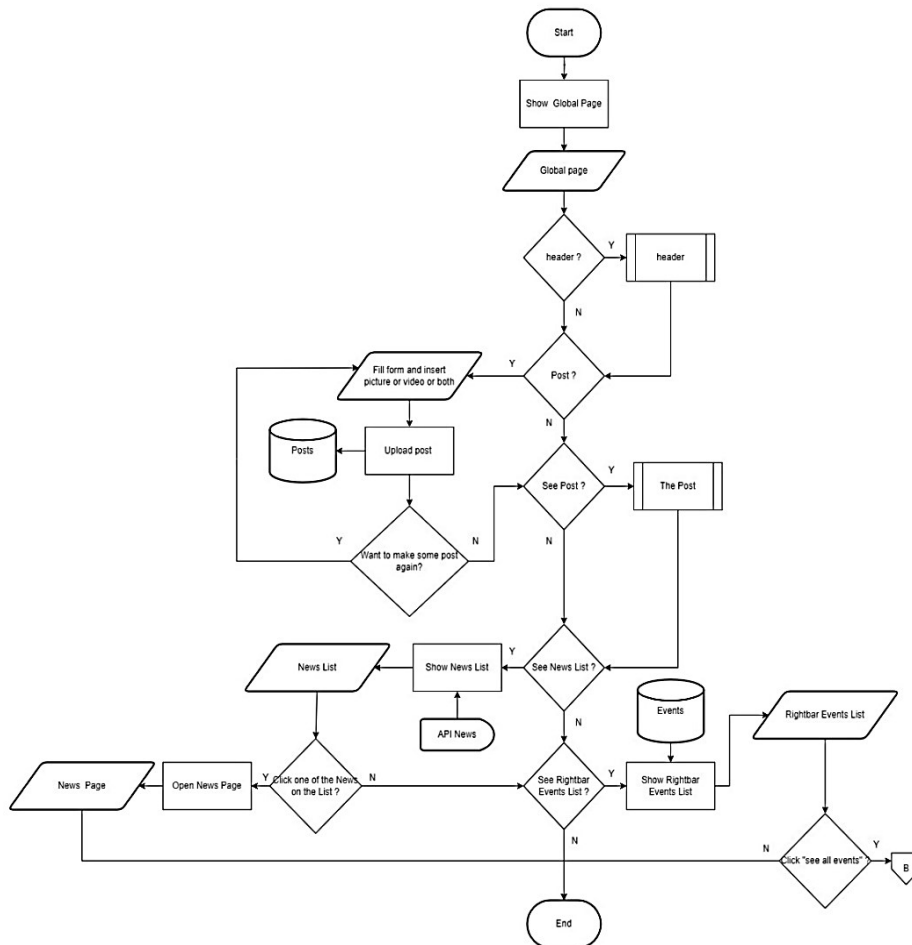


Figure 3. Global page flowchart



The flowchart of the profile page is depicted in Figure 4. The flowchart commences with the initial step of verifying the user's identification, followed by the subsequent step of presenting, and generating the profile page. The data utilized by the system for the process of verifying and presenting profile pages is sourced from the profile table within the database of the system. There are two sorts of page profiles: one that includes the identification of the session owner user, and another that includes the identity of the non-session owner user. The distinction between the two variants of profile pages lies in their respective functionalities. The profile page associated with the session owner's user ID offers an "edit profile" feature, enabling the session owner to modify their name and biography. Additionally, this profile page permits the session owner to send broadcast emails to each follower. On the other hand, the profile page linked to the non-owner's user ID includes a "following" feature, allowing users to follow the profile page associated with the user ID. Furthermore, this profile page facilitates the sending of emails, but for the profile page associated with the user ID of the non-owner, rather than the session owner. The various attributes included on each profile page are encompassed inside the banner and the status right bar.

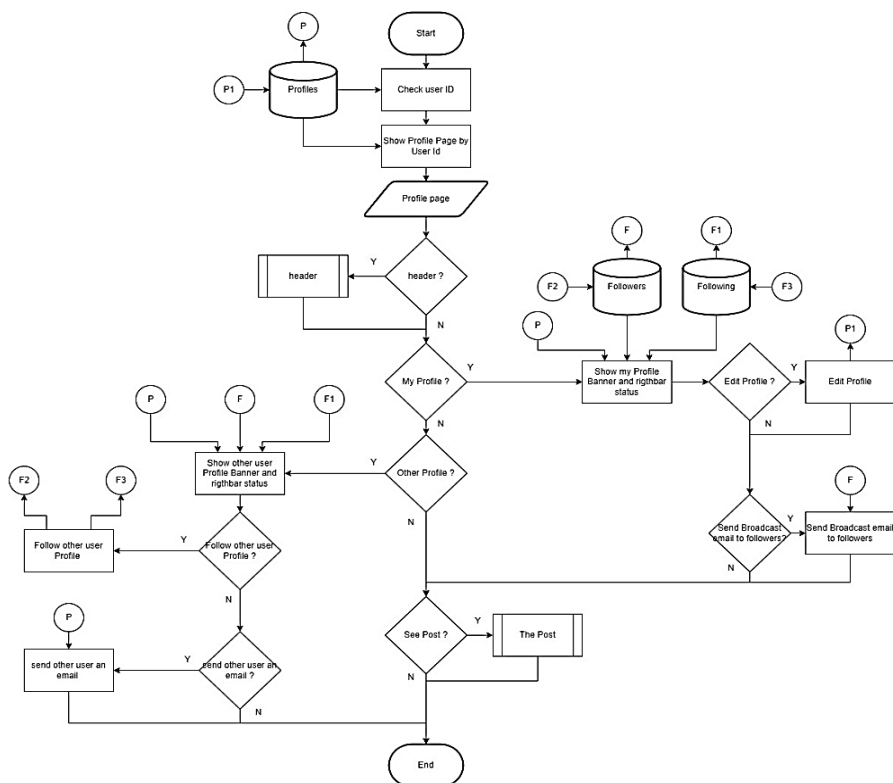
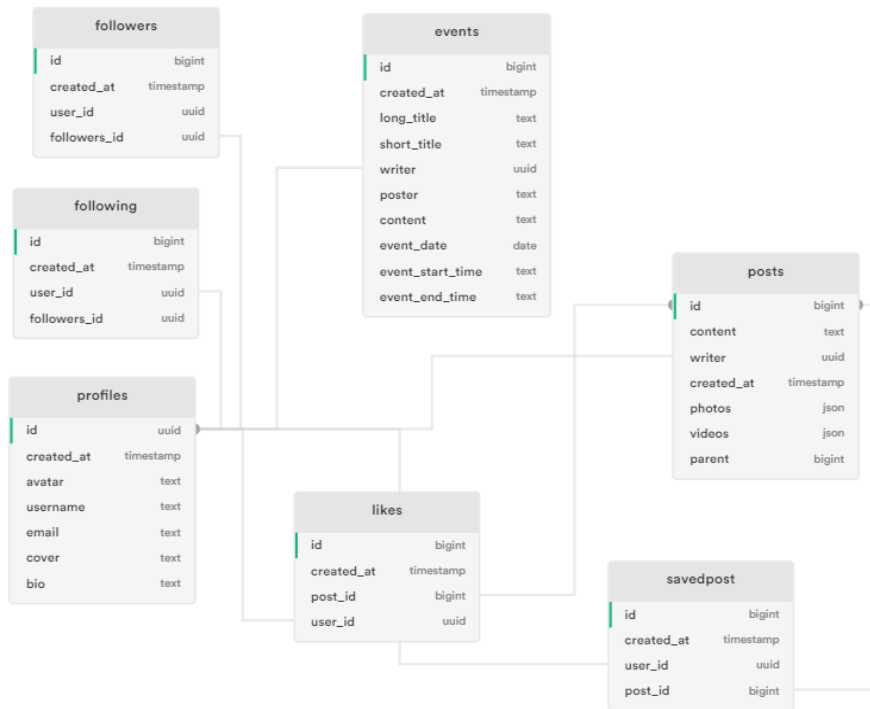


Figure 4. Profile page flowchart

Figure 5 illustrates the entity relationships inside the database of the social community media website system. The system database contains a total of seven tables.



**Figure 5.** Database entity relationship diagram of social community media

### 3) Implementation

The objective of the implementation stage is to execute all the elements that have been devised during the design workshop phase and provide the outcomes to users. The implementation outcomes are produced via a coding procedure that employs the JavaScript programming language, utilizing the Next.js framework and Supabase. Supabase offers a range of backend services, including database management, authentication, file storage, application APIs, and automated tasks [18].

### 4) Testing

The primary objective of the testing phase is to identify and rectify any system faults that may arise inside the backend infrastructure of the social community

media website. The inspection phase will be conducted as part of the implementation process, employing the black box testing methodology.

### 5) Evaluation

The primary objective of the evaluation step is to ascertain whether the online functions developed have successfully fulfilled the user's requirements. During this phase, the evaluation is conducted using the User Acceptance Testing (UAT) approach, wherein Google Forms are employed for survey administration and Likert scales are utilized to evaluate the responses obtained from the surveys. Similar to the actions undertaken during the phase of system requirements planning. To clarity, presented herein is the definitive calculation method for the Likert scale employed in the study.

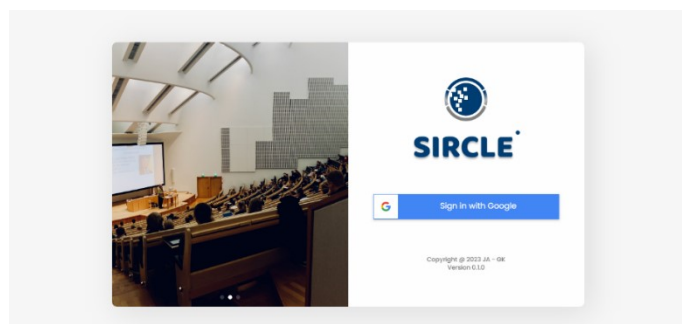
### 6) Report Writing

During the phase of report composition, the objective is to provide a conclusive study report concerning the backend architecture of the social community media platform that has been implemented. The process of report authoring is conducted with Overleaf software.

## 3. RESULTS AND DISCUSSION

Once the design workshop phase concludes, the outcomes of the backend implementation for the social community media website are generated and presented. The subsequent section provides an elucidation of the outcomes obtained from the implementation process.

The login screen of the social community media website is seen in Figure 6. The login procedure enables users to access the system without the need for manual account creation. The authentication mechanism in Supabase is facilitated by the Google provider service for login.



**Figure 6.** Login page Sircle Website

Figure 7 depicts the homepage of the social media platform on a worldwide scale. The uppermost section of the page is comprised of the page header, while the left portion is composed of selectable page menus. The content area of the website includes several elements such as upload components, upload views, and a right sidebar that displays a list of news and events.

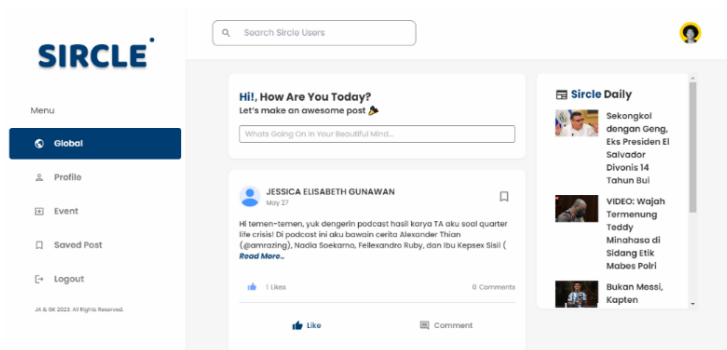


Figure 6. Global Page Sircle Website

The upload form depicted in Figure 8 can be located on the global page. The individuals responsible for the session have the ability to input textual content and upload various forms of media, including photographs and videos. Multiple photo or video material can be uploaded. By leveraging the storage service provided by Supabase, it is possible to store photo and video uploads in an online repository.

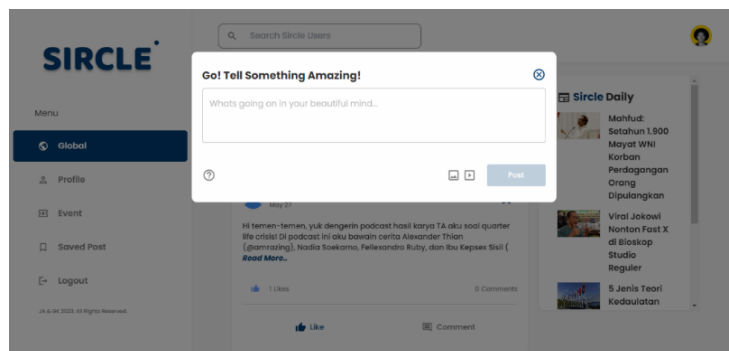


Figure 7. Global Page upload form Sircle Website

Figure 9 displays the header of the website for the social community media system. The header of the webpage has a search functionality and a profile photo that may be clicked to access the profile page. The search functionality located in the header section of the interface will present the fundamental profile information of the user being searched. Upon clicking on this feature, the user will be redirected to the dedicated profile page of the individual in question. The Supabase search

special function is utilized to facilitate the search functionality. Each webpage is often equipped with a header.

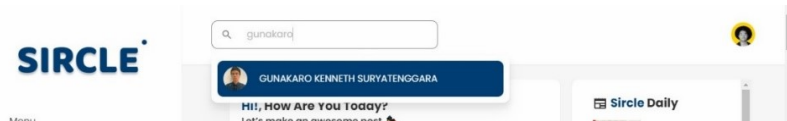


Figure 8. Header Sircle Website

Figure 10 depicts the profile page, encompassing the user identification of the individual who owns the session on the social community media platform. Within the context of the webpage, there exist various profile attributes that are subject to modification, including the ability to alter the banner, profile photograph, and biography. Furthermore, there exist status elements that encompass the quantification of uploads, followers, and following. By leveraging the storage service offered by Supabase, it becomes possible to save profile photos and banner uploads in an online repository.

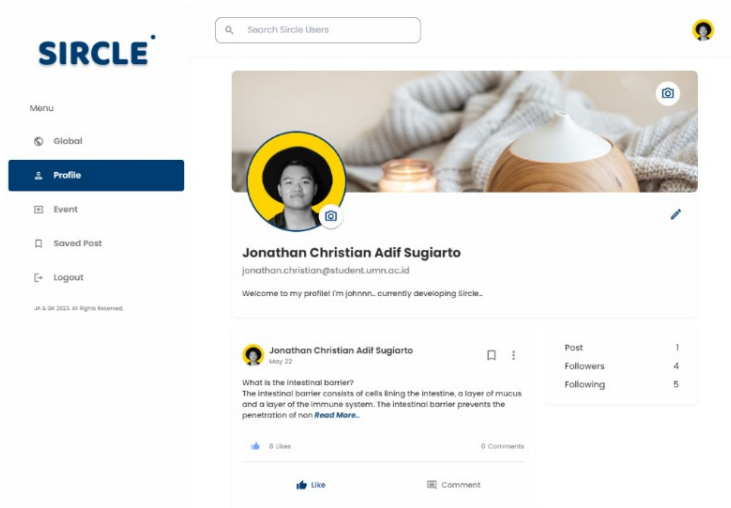


Figure 9. Profile page user id session owner

Figure 11 depicts the profile page within a social media platform wherein the user's identification is utilized, rather than that of the session owner. This page features an email button and a follow button. Furthermore, as depicted in Figure 10, there exist upload components and indicators for the number of uploads, followers, and following, albeit associated with a user identity that does not correspond to the current session owner.

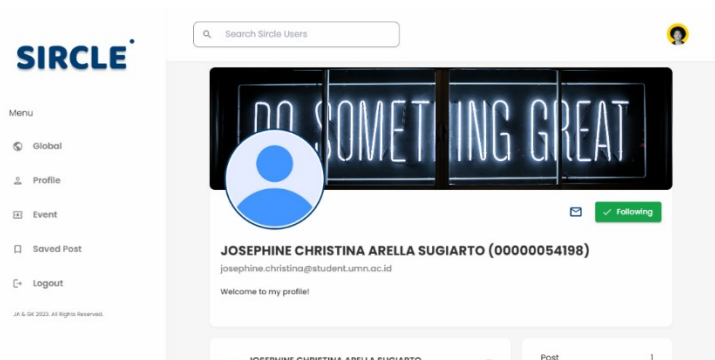


Figure 10. Profile page not the session owner's user id

Figure 12 displays the roster of individuals who have chosen to subscribe to the social community media platform. The subsequent enumeration comprises the avatar and username associated with the user identification (ID) that is now following the profile page being viewed. The image displays a compilation of followers found on the profile page, namely those associated with the user id of the session owner. Notably, this list of followers includes a supplementary functionality that enables the session owner to conveniently send a collective email to all followers simultaneously. The visual presentation of lists of likes and followers on social media platforms is identical.

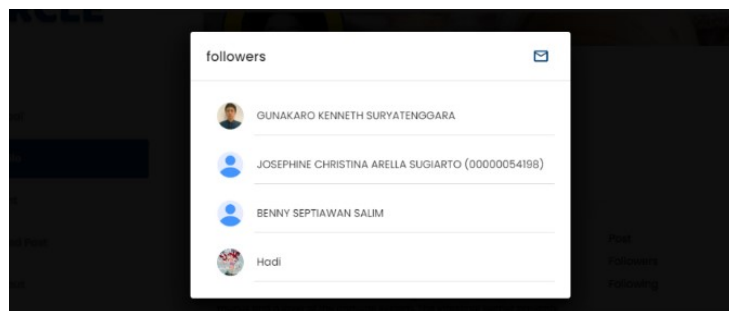


Figure 11. Followers List

Figure 13 depicts the events page on the social media platform for community engagement. The uppermost section of the page is comprised of the page header, the event addition component, and the event list that is presented within the main body of the page. The page menu, which can be selected, is located in the left sidebar of the page. The event addition module comprises an input form that includes fields for the event title, implementation time, implementation date, and event information or event creation details. The input for the implementation date is limited to a single day within the duration of the event, while the input for the implementation time is restricted to the commencement and conclusion times of

the event. The process of event addition exhibits a coding structure that is analogous to that of upload addition.

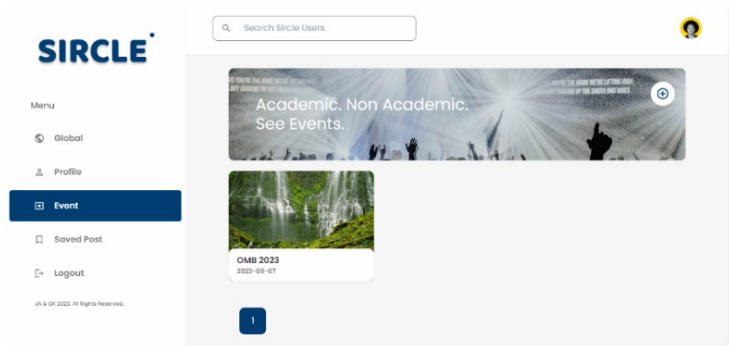


Figure 12. Events Page

Figure 14 depicts a detailed page encompassing comprehensive information pertaining to the occurrence. The contents of this page encompass the title, date of creation, authorship, duration of execution, and date of execution. The structure of the data call code on the event details page is similar to that of the upload.



Figure 13. Event Detail Page

Figure 15 displays the page dedicated to saved posts on the social media platform. The uppermost section of the page is comprised of a page header, while the upper section features a left sidebar that exhibits the page menu, which can be chosen by the user. The upload component is stored in the body of the page, associating it with the user id of the session owner.



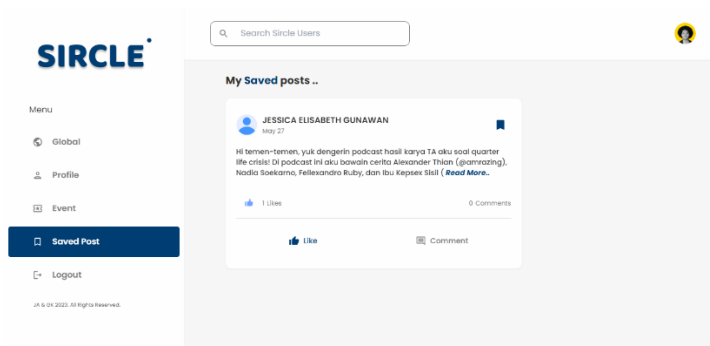


Figure 14. Saved Post page

The assessment of the social community media website system is conducted by formulating inquiries that pertain to indicators related to perceived utility and perceived satisfaction factors. These inquiries are then evaluated using Likert scale calculations, with intervals as depicted in Table 3.

Table 3. Table criteria interval scale Likert

Interval	Criteria
0% – 20%	Strongly disagree
21% – 40%	Disagree
41% – 60%	Neutral
61% – 80%	Agree
81% – 100%	Strongly agree

The web evaluation questionnaire consists of a total of 11 questions, which are divided into two variables: perceived usefulness and perceived satisfaction. The perceived usefulness variable has 5 questions, while the perceived satisfaction variable comprises 6 questions. The subsequent data represents the outcomes of the ultimate computation for each variable. Table 4 presents the final calculation of the percentage value assigned to each item under the Perceive Usefulness variable section. The mean percentage outcome of the final computation is 88.08%. Based on the interval criteria outlined in Table 3, it can be observed that the average outcome of the final calculation falls inside the "Strongly agree" category.

Table 4. Table of Perceive Usefulness Calculation Results

Question	Percentage
Q1	87,90%
Q2	92,09%
Q3	85,11%
Q4	86,51%
Q5	88,83%
<b>Average</b>	<b>88,08%</b>

The final calculation of the percentage value for each item in the Perceive Satisfaction variable section is presented in Table 5. The average percentage result of the final calculation was determined to be 88.67%. According to the interval criteria presented in Table 3, the average result falls inside the category of "Strongly agree."

Table 5. Table of Perceive Satisfaction Calculation Results

Question	Percentage
Q1	88,37%
Q2	90,69%
Q3	86,51%
Q4	89,76%
Q5	87,44%
Q6	89,30%
Average	88,67%

#### 4. CONCLUSION

The findings of the performed research suggest that the back-end design of the social community media website, which was executed using the rapid application development (RAD) method, was successfully built and constructed. Furthermore, an evaluation was conducted to gauge the extent to which Universitas Multimedia Nusantara students embraced the functionality of the social community media website, employing the user acceptability testing (UAT) methodology. The findings indicated that the perceived usefulness variable had an acceptance rate of 88.08%, while the perceived satisfaction variable had an acceptance rating of 88.67%. The results indicate that end users are in strong agreement that the social media platform effectively meets both elements of the aforementioned characteristics.

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