Designing a Web-Based St. Mikael Church Information System

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Abstract— A web-based information system is crucial for efficiently communicating church activities, services, and programs to parishioners and the public. This research aims to solve the problems in St. Michael's Church, namely the dissemination of information that is not in accordance with the times, and the information can be channelled effectively and efficiently. The System manages service schedules, events, and announcements and leverages interactive features to foster active engagement among congregation members. By integrating web technology, churches can enhance communication, streamline operations, and strengthen relationships with parishioners. The St. Michael website was designed by interviewing the church administrator to find parishioners' needs in channelling church information. Website design is the first step, followed by system design submission, website development, and installation at St. Michael church. The study results in the website being perceived as useful and easy for parishioners to use to get information about church activity.

Keywords— church information system, web-based information system, church parishioners, ST. Michael church.

I. INTRODUCTION

Because science and technology are developing at a faster pace than ever before in the era of digital transformation, information systems are growing at a rapid pace. [1]. Once merely a place of worship, the church saw its role evolve to reflect the times. As a result, each church had to adjust to the changing circumstances by beginning new endeavours. The most significant aspect of the church is its members, who are individuals called and sanctified by God by their belief in Christ. The church is not the physical structure or site of worship. [2].
Websites are constantly evolving to meet people's wants for information in various areas of life. In addition to being dispersed more uniformly, information can move around the website effectively and efficiently.[3].

A web-based church information system makes it possible to process grades more quickly, effectively, and efficiently while making it easier for interested parties to access the information. interested parties [4]. JavaScript is a computer language consisting of a group of scripts that provide websites with more dynamic elements and interactivity. JavaScript's primary purpose is to enable web pages to react in real-time to user input, form submissions, button clicks, and page navigation[5].

A web page's basic structure is provided by HTML, which gives programmers the flexibility to arrange and display different kinds of content, including text, photos, videos, links, and other elements as needed. Developers can use HTML to control how content is arranged and presented on a web page [6]. Developers can use CSS to modify the visual look, and HTML can be used for basic structure and content. This allows them to separate content from presentation. This makes it possible for developers to control web pages' look and feel more effectively and flexibly [7]. Due to

MongoDB's design, large-scale data management and handling may be done efficiently and flexibly. MongoDB is a NoSQL database that uses documents stored in JSON format rather than the conventional table structures in relational databases. This gives it a great deal of flexibility when storing and retrieving data. MongoDB is well-liked by developers and tech companies because of its many great features[8].

Services communicate through an API or Application Programming Interfaces using the HTTP protocol. REST is a web service architecture that is client server in nature clients makes a request and returns a response. Express.js' primary goal is to simplify JavaScript server-side development by giving web application developers a straightforward yet effective interface. Express.js makes it simple for programmers to create robust and effective server-side JavaScript applications[9].

Reacts' primary objective is to simplify the process of creating user interfaces for dynamic web apps. React enables developers to create UI components that are easily maintained and organized, which speeds up the iterative process of developing applications[10].

With Node.js, programmers utilizing the more widely utilized JavaScript language for client-side development may create server-side apps. This gives developers additional chances to use a language they are comfortable with to create web applications that can operate on the server side. The ability of Node.js to create event-driven, non-blocking applications is one of its primary features[11].

II. METHOD

The methodology used in developing the St. Mikael Church System uses a website with the waterfall method. Waterfall or classic life cycle research method model, The waterfall research model provides software sequentially or sequentially starting from analysis (analytics), design (design), coding (code), testing and support stages (support system) [12].

The steps in a waterfall cycle are carried out one after the other, beginning with the first step. To ensure that the processes have been completed accurately and in accordance with expectations, each finished step needs to be checked, sometimes with the help of professional users. This is especially important regarding the requirements specification and system design. If not, you must either go back to the previous step or repeat the process[13].

Testing the St. Michael website with quantitative methods will involve parishioners and administrators from St. Michael church. One technology acceptance model that incorporates components from the eight previous models employed is the Unified Theory of Acceptance and Use of Technology (UTAUT). Of the eight existing models of technological acceptance[14]. UTAUT attempts to clarify inviting someone to utilize an IT system and the conduct of future users [15]. This study employs five core determinants of use *(intention and usage)*, including *Performance Expectancy* (PE), *Effort Expectancy* (EE), *Social Influence* (SI), *& Facilitating Conditions* (FC).

III. DESIGN AND RESULT

Results and Discussion contains the results, their relation with theory, and their comparisons with previous studies.

A. Design

A flowchart is a flow diagram that describes the steps, sequence and decisions that will be made when you want to design a process. In developing the St. Michael website, what is done is planning and submitting the project, which is approved by the supervising lecturer, moving on to the website design stage, and then going to the website creation or development stage; when finished, it goes to implementation and leads to website operation.

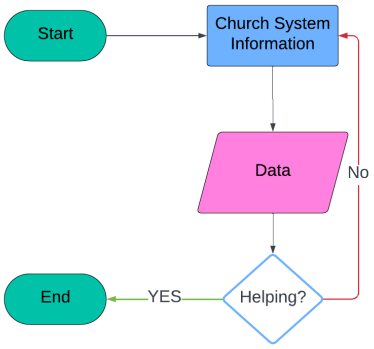

Figure 3.1 User Flowchart Diagram

In the flowchart image 3.1 it is explained that to access the St. Mikael church website by entering the url. On the St. Mikael church website displays information that church members need.

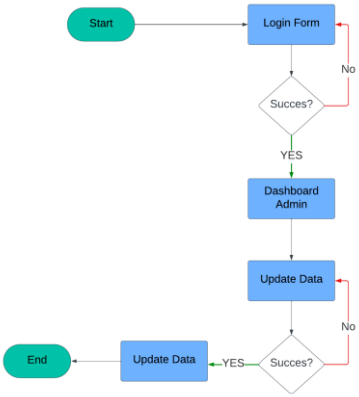

Figure 3.2 **Admin Flowchart Diagram**

In Figure 3.2 there is a user flowchart describing all website activities. In the flowchart, the user does not need to log in first, the user will be immediately displayed on the home page, and can already see the information provided by the admin of the St. Mikael church. In the flowchart above, the admin is required to log in to the admin dashboard to prevent unwanted things from happening.

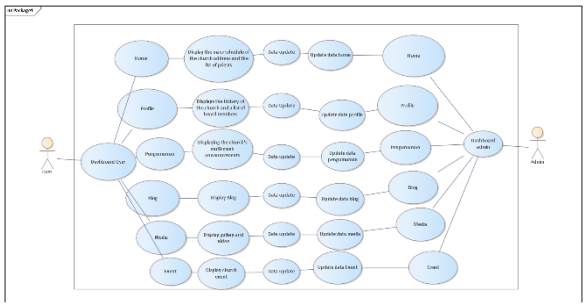

Figure 3.3 Use Case Diagram

Figure 3.3 illustrates the admin actor with an account to access the dashboard. Admins have the right to add data, edit data, and delete data that will be displayed on the website. In Figure 3.3, it is illustrated that the user is given a feature that can make it easier for them to find church information. These features include home, profile, announcements, blogs, media, and events. These features have made it easier for users to find St. Mikael's church information.

B. Implementation

User Page

Figure 3.4 the "home" tab will appear automatically when a user visits the St. Mikael website. Within the "home" tab, users can access events, WhatsApp, List of Parish Priests, Mass Schedule, and Church Address. The informational feature is sensitive data that significantly affects group activities, such as survey results and invoices.

Figure 3.4 Page Views

The profile view of the history of St. Mikael Semarang Indah parish in Figure 3.5 views the vision, mission, and history of the St. Mikael parish history.

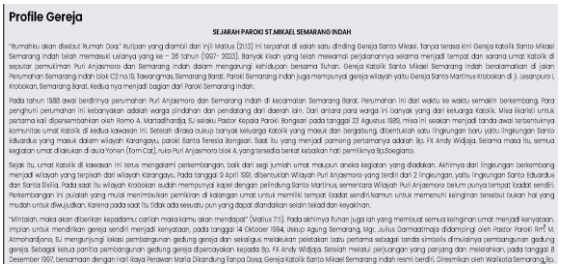

Figure 3.5 Profile page Users

On the profile view, there is not only history but also a list of church administrators, starting from the parish priest to other church administrators. The church

administrator image is in Figure 3.6.

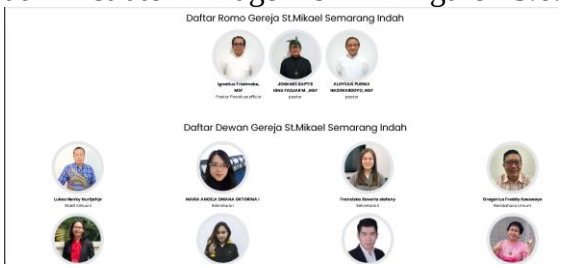

Figure 3.6 Profile Page Users

In the announcement view in St. Michael website there is a search feature to search for announcements that have passed if the user needs information from the announcement for the announcement view in Figure 3.7.

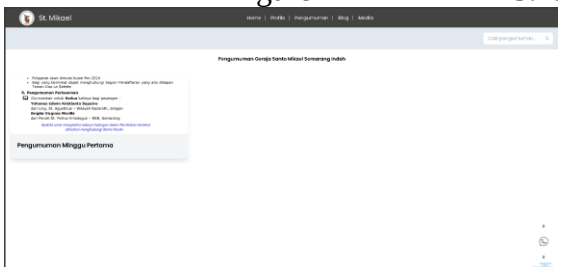

Figure 3.7 Announcement Page

Users can read the event news, and also on the blog feature, there is also a filter for the blog segment for the blog segment in Figure 4.0.

Figure 3.9 Blog Filter

The Media display is a place to upload the St. Mikael church gallery on the media display; there is also a video about St. Mikael church, and the video is uploaded via YouTube; if the user clicks on the video, then the user will be directly redirected to the youtube website so that the user will watch the video via youtube for the media display is in Figure 3.10.

Figure 3.10 MediaPage

Admin Page

Figure 3.11 is a view of the admin login form. The login form is where the admin enters the username and password. The admin is required to log in with the username and password first. If the admin is successful, it will enter the admin dashboard display, but if the admin fails to do the login form, the admin must repeat filling in the username and password on the login form page.

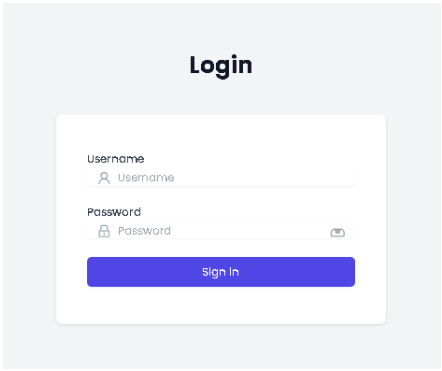

Figure 3.11 Admin Login Page

The admin dashboard is a page that displays all St. Mikael church data. The admin dashboard is where admin activities can be carried out to update data. This data includes schedules, events, profiles, announcements, blogs, and galleries. The admin dashboard image can be seen in Figure 3.12.

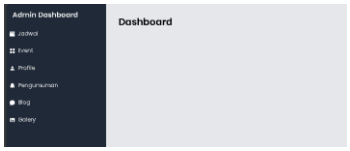

Figure 3.12 Dashboard Admin Page

Figure 3.13 is a display of the added mass schedule. In adding a mass schedule, the admin must enter the mass celebration day and set the hour for the mass schedule before it can add mass schedule data. The hour setting for this display uses a.m. and

p.m. and has been automatically replaced following WIB.

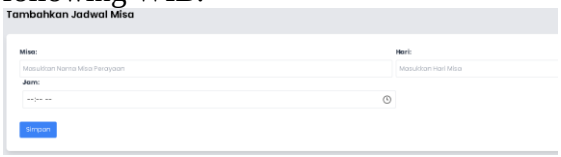

Figure 3.13 Dashboard Admin Page

Figure 3.14 displays the edit mass schedule form. The admin can change the mass celebration on the day of implementation and set the time of the mass. To update the data, the admin must fill in all the required information on the form in Figure 3.14.

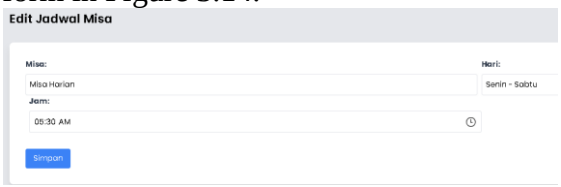

Figure 3.14 Edit Mass Schedule

Figure 3.15 is a view of adding events. To add events, the admin must enter the event title, event description, jpg or png image for posters at the event, and contact information. After completing all inputting event data, the admin can then add data for the event.

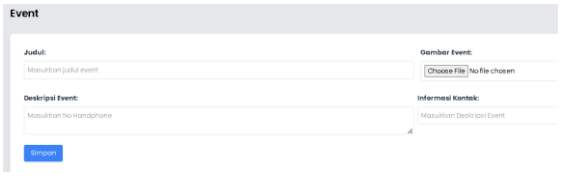

Figure 3.15 Add Event Page

Figure 3.16 displays the event editing screen, where the admin must fill in all the information required to update the event data.

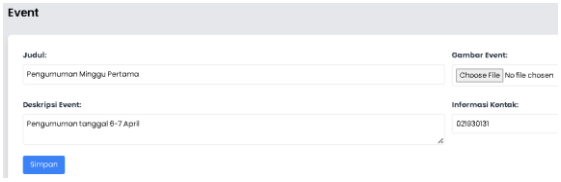

Figure 3.16 Event Edit View

Figure 3.17 is a view of the added profile, where the admin adds data to the profile. An add profile is also provided; add history if the church wants to enter a new history of the church, which can be input through add history.

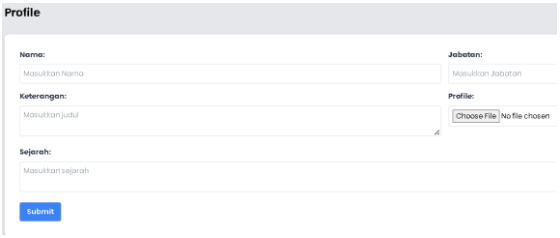

Figure 3.17 Add Profile View

Figure 3.18 shows the profile edit page where the admin must enter the required information. Admins must fill in all the details on the profile edit page to update the data appropriately.

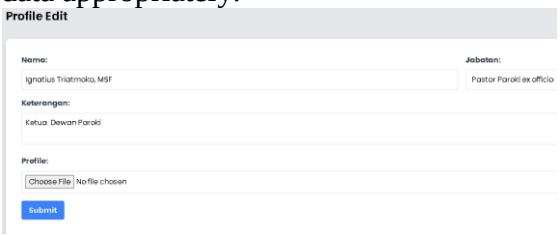

Figure 3.18 Edit Profile View

Figure 3.19 displays the added announcements; the admin must enter the announcement data to add announcements. The announcement is in the form of points, so the admin can enter these points using the add points button.

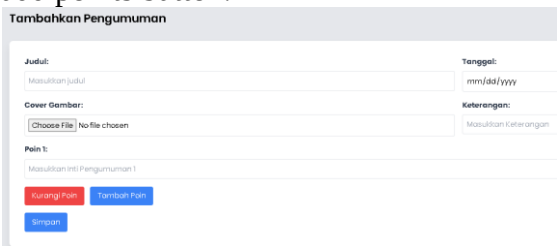

Figure 3.19 Display of Add Announcement

In Figure 3.20, we can see the edit announcement page, where the admin has to fill in all the information to complete the announcement editing form. Although the admin is not required to fill in every point, the admin has the option to delete points that are not relevant to him.

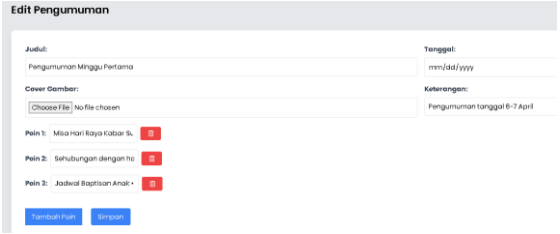

Figure 3.20 Announcement Edit View

Figure 3.21 shows a view of adding a blog; the admin must enter blog data to add a blog. On the blog view, there are two narratives in the narrative textbox; the admin can enter two narrative points. The narrative can also be in the form of a long paragraph so that the admin does not need to be afraid to enter narrative data.

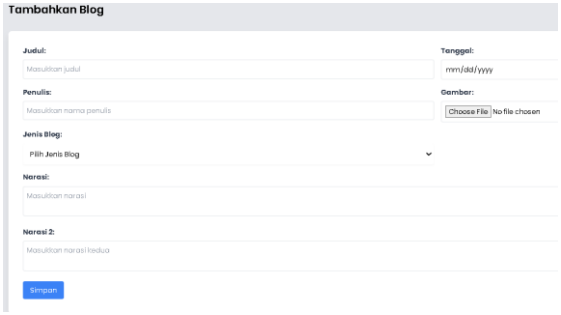

Figure 3.21 Add Blog View

In Figure 3.22, you can see the blog edit page where the admin can update data. The admin can change the existing narrative with a new one. In addition, the admin can select the desired blog category to place the blog type.

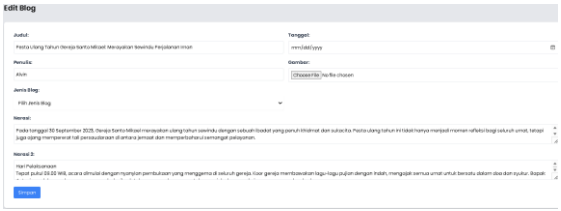

Figure 3.22 Blog Edit View

In Figure 3.23, the admin can enter a YouTube link using only the YouTube URL that will be entered in the data gallery. In addition, the admin can enter images to be included in the church gallery so that people can see photos of church activities.

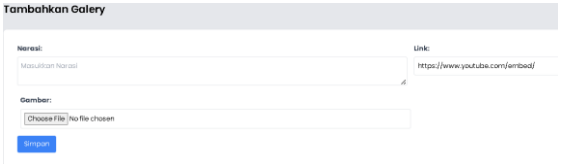

Figure 3.23 Blog Edit View

In Figure 3.24, you can see the media edit view where the admin can change the YouTube URL to change the video displayed. In addition, on this media edit page, the admin can also upload images without changing the YouTube URL link.

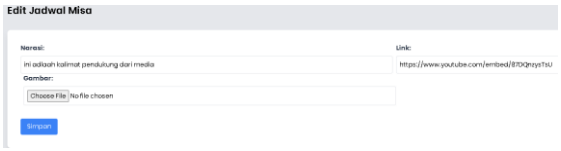

Figure 3.24 Media Edit View

C. Testing

A validity test is done to see the accuracy of something's measurement. Instrument from validation tests This consists of several variables, including PE, SI, EE, FC, BI. Table 3.1 shows that the data is validated validly with a mark above 0.5.

Table 3.1 Validation Test

Rotated Component Matrix

	Component			
	1	2	3	4
EE1	,004	,822	,118	,307
EE2	-,032	,696	,164	,256
EE3	,069	,819	,186	,045
PE1	,844	,048	,275	-,003
PE2	,883	-,007	,197	,113
PE3	,840	-,110	,196	,243
FC1	,155	,329	,196	,713
FC2	,108	,123	,199	,873
FC3	,056	,079	,088	,784
SI1	,674	,555	,067	,114
SI2	,634	,591	,023	,150
SI3	,678	,609	-,007	,169
BI1	,112	,156	,898	,161
BI2	,144	,165	,917	,179
BI3	,180	,050	,887	,153

Table 3.2 provides a summary of the results of the validity testing that was carried out. The conclusion is that there is a significant relationship with *Cronbach's Variable alpha*.

Table 3.2 Reliability Test Results

Variable	*Cronbach's Alpha*	*Internal Consistency*
PE	0.909	Excellent
SI	0.919	Excellent
EE	0.807	Good
FC	0.736	Acceptable
BI	0.918	Excellent

Table 3.3 described correlation testing report:

1. The PE variable significantly correlates with the BI variable, as evidenced by the significance value of 0.05 ≤ 0.05 marked with the symbol (**). This indicates a very significant positive relationship between PE and BI.
2. The EE variable shows a significant correlation with the BI variable, as evidenced by the significance value of 0.36 ≤ 0.1, marked with the symbol (*). This indicates a very significant positive relationship between EE and BI.
3. The SI variable shows a significant correlation with the BI variable, as evidenced by the significance value of 0.27 ≤ 0.1, marked with the symbol (*). This indicates a very significant positive relationship between SI and BI.
4. The FC variable shows a significant correlation with the BI variable, as evidenced by the significance value of 0.011 ≤ 0.1, which is marked with the symbol (*). This indicates a very significant positive relationship between FC and BI.

Table 3.3 Correlation Testing

Correlations

		SEE	SPE	SSI	SFC	SBI
SEE	Pearson Correlation	1	,113	,453**	,461**	,276*
	Sig. (2-tailed)		,398	,000	,000	,036
	N	58	58	58	58	58
SPE	Pearson Correlation	,113	1	,568**	,280*	,361**
	Sig. (2-tailed)	,398		,000	,034	,005
	N	58	58	58	58	58
SSI	Pearson Correlation	,453**	,568**	1	,423**	,291*
	Sig. (2-tailed)	,000	,000		,001	,027
	N	58	58	58	58	58
SFC	Pearson Correlation	,461**	,280*	,423**	1	,332*
	Sig. (2-tailed)	,000	,034	,001		,011
	N	58	58	58	58	58
SBI	Pearson Correlation	,276*	,361**	,291*	,332*	1
	Sig. (2-tailed)	,036	,005	,027	,011	
	N	58	58	58	58	58

IV. CONCLUSION

Creating a design utilizing Figma as a tool is the first step in building a church information system. The following step involves making a JavaScript program after the design is finished. Express.js and Node.js are used in the backend development, with MongoDB database integration coming first. Three primary folders comprise the backend structure: route for program flow, controller for program logic, and model for database development. Following the completion of the backend, React and Vite are used to develop the frontend. React uses the data from the backend API to generate a RESTful API. Testing and hosting bring a website to a close.

From an administration of the St. Mikael church, the information system aims to give members of the church access to information and church events. People are given information through mass schedules, church bulletins, media, church events, church history, board lists, announcements, and minutes. Church news can be used to direct activities, making the St. Mikael church website feel helpful to people. The St. Mikael church information system is managed by a user-friendly system administrator, making it effortless for them to send out church announcements.

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