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Management Information System and E-Khairat for Masjid Al-Ikhwan Kampung Kemuning

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Abstract: Masjid Al-Ikhwan currently does not have any web-based system and still using the traditional way for information management. The people of kampung Kemuning still sending invitation using paper, watch religious video from Whatsapp, transfer information of lecture by person and pay funeral expenses manually. Therefore, a web-based Management Information System And E-Khairat for Masjid Al-Ikhwan Kampung Kemuning is developed to ease the people from Kampung Kemuning in getting information, send invitation, pay funeral expenses, and watch religious videos. The main language that being used in the system are HTML, CSS, JavaScript and PHP. While for the database, it uses MySQL to store data. The system should be able to reduce the usage of paper in order to send invitation and reduce the misleading religious video.

Keywords: Management information system, web-based, funeral expenses

1. Introduction

The management information system for mosques in Malaysia is mostly made only for state mosques or large mosques across the country. Mosques for housing estates or villages still do not have their own management information system. Among the mosques that have their own management information system is the Tuanku Mizan Zainal Abidin Mosque in Putrajaya, also known as the Iron Mosque. Apart from this mosque, the Kuala Lumpur Federal Territory Mosque also has more or less the same management information system.

Therefore, the Management Information System and E-Khairat for Masjid Al-Ikhwan Kampung Kemuning has been developed to help the residents obtain information about mosque activities that will be held such as religious talks, and residents to hold the ceremony or programs without having to invite the neighbours from house to house or asking in the WhatsApp groups or directly to the mosque committee members. Through this system, residents also can pay funeral expenses online.

The following objectives are listed to achieve the aim:

1. To design the Management Information System and E-Khairat for Al-Ikhwan Kampung Kemuning using a sequential-based approach.

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2. To develop the Management Information System and E-Khairat for Masjid Al-Ikhwan Kampung Kemuning using a web-based approach.
3. To test the developed system.

2. Related Works

2.1 Management Information System

Systems management describes the central management of an organization's information technology (IT). The idea encompasses a wide range of subsystems that are essential for appropriately managing and monitoring IT systems. Organizing and managing IT infrastructure is crucial for the organisation. The core of an IT-based firm is effective system management. The effective implementation makes it much simpler to supply IT, which helps staff members adapt more quickly and work more efficiently [1].

Mosque IT-based information management is very important because it will make it easier for mosque committee members to manage matters related to the mosque and announce mosque activities by only using a more systematic system. However, many mosques in Malaysia still do not use this IT-based management system. It should be that a mosque in 2022 is already following the current development which is the use of information technology in managing mosque information. This is because the management of information becomes easier and also the dissemination of information to the mosque's members. Anyway, several in-town mosques in Malaysia have already started using the IT-based information management system in managing the systems in the mosque as well as advertising the information about mosque activities to the public.

2.2 Similar System

The three similar existing systems selected for this study are the Masjid Tuanku Mizan Zainal Abidin, Masjid Wilayah Persekutuan Kuala Lumpur and Jabatan Hal Ehwal Agama Islam Negeri Kedah Darul Aman system.

2.2.1 Masjid Tuanku Mizan Zainal Abidin

The Masjid Tuanku Mizan Zainal Abidin system offers functions for booking study classes, booking wedding rooms, booking rooms and booking services in E-Imarah. The advantage of using this function is to facilitate any type of program booking for outsiders and make it easier for the mosque staff to get information about the booking that has been made and this also avoids two different bookings being held on the same day or at the same time.

2.2.2 Masjid Wilayah Persekutuan Kuala Lumpur

The Masjid Wilayah Persekutuan Kuala Lumpur system offers the function of announcing information that happens in the mosque. This function is inside the main page. The advantage of using this function is to make it easier for committee members to notify the public about the mosque's activities and to make it easier for the public to know about the activities that will be held at the mosque.

2.2.3 Jabatan Hal Ehwal Agama Islam Negeri Kedah Darul Aman

The Jabatan Hal Ehwal Agama Islam Negeri Kedah Darul Aman system offers a video gallery function. The advantage of using this function in the developed system is to make it easier for people who missed attending the religious talk held in the mosque to rewatch. In addition, it can help the speakers in spreading the knowledge presented.

2.3 Comparison between the existing system and the developed system.

Table 1 shows the comparison made between the existing system and the developed systems.

Table 1: System comparison

Functions/System	Masjid Tuanku Mizan Zainal Abidin	Masjid Wilayah Persekutuan Kuala Lumpur	Jabatan Hal Ehwal Agama Islam Negeri Kedah Darul Aman	Masjid Al-Ikhwan
Login	No	No	No	Yes (IC and password)
Platform	Web browser	Web browser	Web browser	Web browser
E-Khairat	No	No	No	Yes
Information announcement	Yes	Yes	Yes	Yes
Lecture recording	No	No	Yes	Yes
Program booking	Yes	No	Yes	Yes
E-Khairat reports	No	No	No	Yes
User module	Local residents, mosque committee member	Local residents, mosque committee member	Local residents, mosque committee member	Local residents, mosque committee member

Based on Table 1 above, all of the systems do not have a login feature except the Masjid Al-Ikhwan system. As shown in Table 1, all of the systems are using the same platform which is the web browser. The E-Khairat function, which is the funeral expenses, is only available in Masjid Al-Ikhwan. All of the systems have the same function which is information announcement. For the lecture recording function, the Masjid Tuanku Mizan Zainal Abidin system and Masjid Wilayah Persekutuan Kuala Lumpur system do not have the function. Next, for the program booking function, only Masjid Wilayah Persekutuan Kuala Lumpur system does not have this function. All of the system has the same user module which are local residents and mosque committee member.

3. Methodology/Framework

The methodology for this project uses the Agile model. This chapter discusses the Agile model and its phases. This chapter also describes the system development workflow and the system analysis and design.

3.1 Agile Model

A methodical framework known as methodology is used to solve research problems by selecting the best and most practical ways to carry out the study while staying true to the study's purpose and goals [2]. Agile is an iterative methodology that enables organised teams to maintain focus and produce their best work. A company's clients stand to gain a lot by adopting the agile process for software development [3].

There are six phases for agile software development which are the concept phase (plan), inception phase (design), iteration phase (develop), release phase (test), maintenance phase (deploy), and retirement phase (reviews) in order to build a complete software system development system.

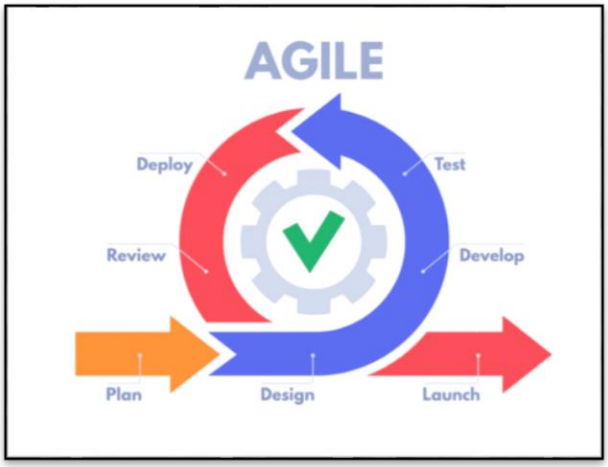

Figure 1: Phases of Agile Software Development Life Cycle [4]

3.1.1 Concept Phase (Plan)

The concept phase is the first phase of the agile development process. The product owner will choose the goal and range of the software during this step. The product owner will produce a paper outlining the essential specifications for the product. The time needed to execute this task and any potential commercial prospects will also be determined [4]. In this phase, the proposal and a Gantt chart were prepared according to a timeline. The scope of the project and the expected outcome have also been identified.

3.1.2 Inception Phase (Design)

For this phase, the user interface of the Management Information System and E-Khairat for Masjid Al-Ikhwan Kampung Kemuning is designed by using wireframe. The wireframe is created using the online web which is draw.io. In addition, a flowchart, context diagram, data flow diagram level 0 and entity relationship diagram were created to fulfil the task inside this phase.

3.1.3 Iteration Phase (Develop)

Testing is a key feature of this phase. Tests are supposed to be run after each iteration in order to avert mistakes and maintain quality [3]. In this phase, by using the Hypertext Markup Language (HTML), Cascading Style Sheets (CSS), Hypertext Preprocessor or known as Personal Home Page (PHP), JavaScript and X-operating system, Apache, MySQL, PHP, Perl (XAMPP) are used to make the system of this Management Information System and E-Khairat for Masjid Al-Ikhwan Kampung Kemuning.

3.1.4 Release Phase (Test)

The quality assurance (QA) team conducts tests to ensure the software's functionality prior to the product's release. The members of the QA team will test the programme to ensure that the code is clear, and if there are any possible problems or defects, the development team will take swift action to fix them [4]. In this phase, a prototype was developed to see whether the system is fully functional and to see if there are any bug or bottleneck in the system.

3.1.5 Maintenance Phase (Deploy)

The consumers may now access the software in its entirety. Consequently, the product enters the maintenance phase. In this stage, the development team works closely with the client to verify that the programme functions properly and is bug-free. To improve the usability and convenience of the current product for the users, additional revisions may be made throughout time [4]. For this phase, the fully functional system will be released and can be used by the users and administrator of the target users.

3.1.6 Retirement Phase (Reviews)

A system may be retired because it is replaced by new software or because it has outlived its usefulness or become incompatible with the organisation. The programme will initially be discontinued after notifying users. Users will be moved to the most recent system when it is replaced. Last but not least, the engineers will complete the last tasks and stop providing support for the outdated programme. Agile uses several iterations to improve deliverables and get outstanding results [4]. In this phase, feedback will be given to all of the target user to get good or bad comments in order to improve the developer team and improve all the phases that has been done.

3.2 System Development Workflow

Table 2 shows the system development where activities are specified according to each Agile model phase. Based on each phase, the outputs are listed.

Table 2: System development workflow

Phases	Task	Output
Concept (Plan)	• Proposed idea, title to supervisor • Prepare project proposal • Make Gantt Chart • Determine the problem statement, objective, project scope, project significance	• Gantt Chart • Project proposal • Meeting with supervisor
Inception (Design)	• Create wireframe • Create flowchart • Create context diagram • Create data flow diagram level 0 • Create entity relationship diagram	• Wireframe • Context diagram • Data flow diagram level 0 • Entity relationship diagram
Iteration (Develop)	• Code HTML, CSS, JavaScript, PHP • Make database	• The user interfaces • The admin interfaces • The function of each interface • Tables in database • Connection between database and interfaces
Release (Test)	• Test the prototype • Find bugs and error in the prototype	• Prototype • Testing results
Maintenance (Deploy)	• Release fully functional system	• Full functional system
Retirement (Reviews)	• Give feedback to target user	• Good or bad reviews

3.3 System Analysis and Design

The system analysis and design consist of the Context Diagram, Data Flow Diagram level 0 and the Entity Relationship Diagram (ERD).

3.3.1 Context Diagram

A context diagram offers a comprehensive overview of a system. It's a simple diagram that outlines an entity's scope, limits, and relationships to other external components like stakeholders. A context diagram, sometimes referred to as a Level 0 data flow diagram, gives a broad perspective of a process

while putting less emphasis on internal sub-processes and more on how it interacts with external factors. For more complex data flow diagrams, the latter is often used [5].

Figure A.1 shows the context diagram for the Management Information System And E-Khairat for Masjid Al-Ikhwan Kampung Kemuning. There are two entities which are administrator and users that have been included in the context diagram.

3.3.2 Data Flow Diagram Level 0

DFD represents the data flow of a system or process. It also sheds light on each entity's inputs, outputs, and the process itself. There are no loops, decision rules, or control flows in DFD. A flowchart can describe specific operations depending on the type of data. There are various ways to represent a data flow diagram. The DFD is a modelling tool for structured analysis [6].

Figure A.2 shows the DFD level 0 of the Management Information System And E-Khairat for Masjid Al-Ikhwan Kampung Kemuning. The DFD level 0 shows the data flow between entities, 5 modules or processes and four tables in the system.

3.3.3 Entity Relationship Diagram (ERD)

A graphical representation that shows relationships between individuals, things, locations, concepts, or events inside an information technology (IT) system is called an entity relationship diagram (ERD), also known as an entity relationship model. In order to design business processes and provide the groundwork for a relational database, an ERD employs data modelling techniques [7].

Figure A.3 shows the ERD for the Management Information System and E-Khairat for Masjid Al-Ikhwan Kampung Kemuning.

4. Result and Discussion

To develop Management Information System And E-Khairat for Masjid Al-Ikhwan Kampung Kemuning, the system used HTML, CSS, PHP, JavaScript and XAMPP in order to create the front-end and also the back-end for the user and admin. While PHP is utilised for the system's back end, JavaScript works with HTML and CSS to optimise the system with dynamic behaviour and certain special effects. For database, the system used MySQL to store data from both admin and user web pages.

This section discusses the results and discussion of the project, which are the system implementation, and system testing.

4.1 System Implementation

In the Management Information System And E-Khairat for Masjid Al-Ikhwan Kampung Kemuning, there are two types of entity that will use the system which are user and administrator.

4.1.1 User

In this section, there are several modules that have been implemented in the system for the user.

4.1.1 User Login Interface

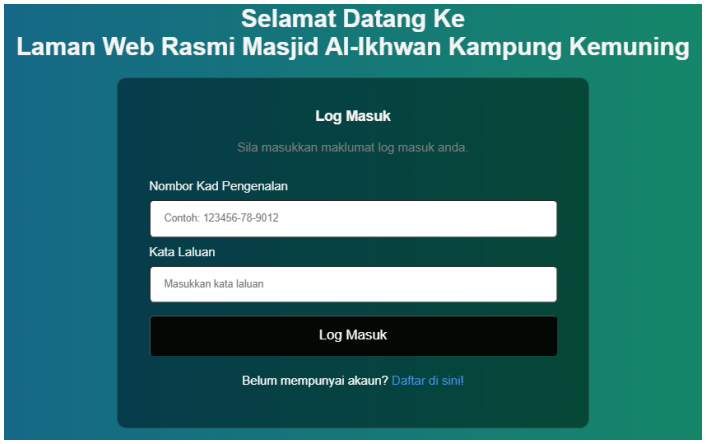

Figure 2: Login interface (user)

User can view two sites of the system which are the dashboard and video page without needing the user to login. However, the user has to login first before user can use all of the pages in the system. Therefore, this module was created to differentiate between logged-in users and unlogged-in users. For a user to login, the user needs to enter user's Identification Card (IC) number and the password. Both the IC number and password need to be correct based on the format of IC number and the data that has been stored in the database. If the user entered the wrong password, wrong IC number, etc. the system will give the user error messages at the top of the login button. If the user entered the correct data, the user will be redirected to the dashboard. Figure 2 shows the login interface for the user.

4.1.2 User Signup Interface

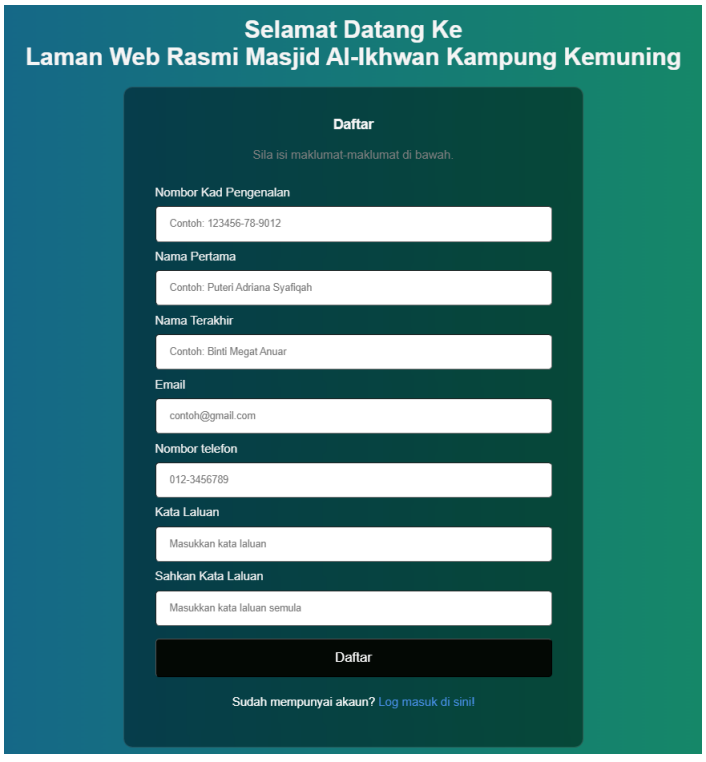

Figure 3: Signup interface (user)

For signup module, users need to enter their information in order to create an account. Users need to enter the information correctly or else the user will have error messages at the top of the signup button. If the user has entered the information correctly, the user will be redirected to login page. Figure 3 shows the signup interface for the user.

4.1.3 User Dashboard Interface

Figure 4: Dashboard interface (user)

For the dashboard, everyone can see it even without login. The user will see the welcoming words in the system and the user also will see the mosque's activities that have been added by the administrator. Figure 4 shows the dashboard interface for the user.

4.1.4 User E-Khairat Interface

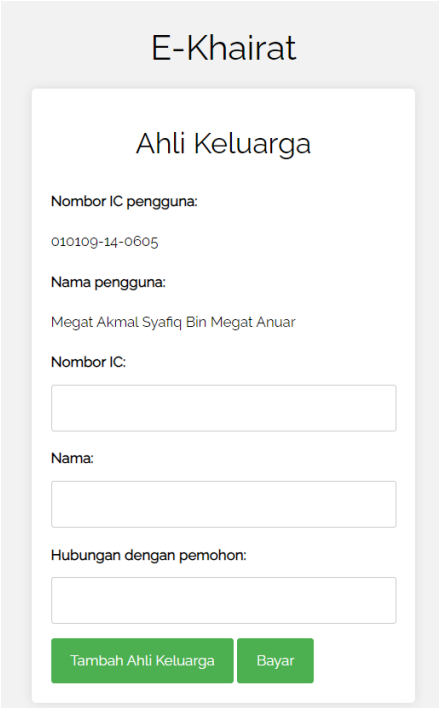

Figure 5: E-Khairat interface (user)

For E-Khairat, the user needs to login first before using this module. The user needs to enter the user's family members' information to pay for the funeral expenses. If there are more family members, user need to click on "Tambah Ahli Keluarga" and can proceed to payment by clicking on "Bayar". Then, the user will be redirected to toyyibPay to continue the payment. Figure 5 shows the E-Khairat interface for the user.

4.1.5 User Signup Interface

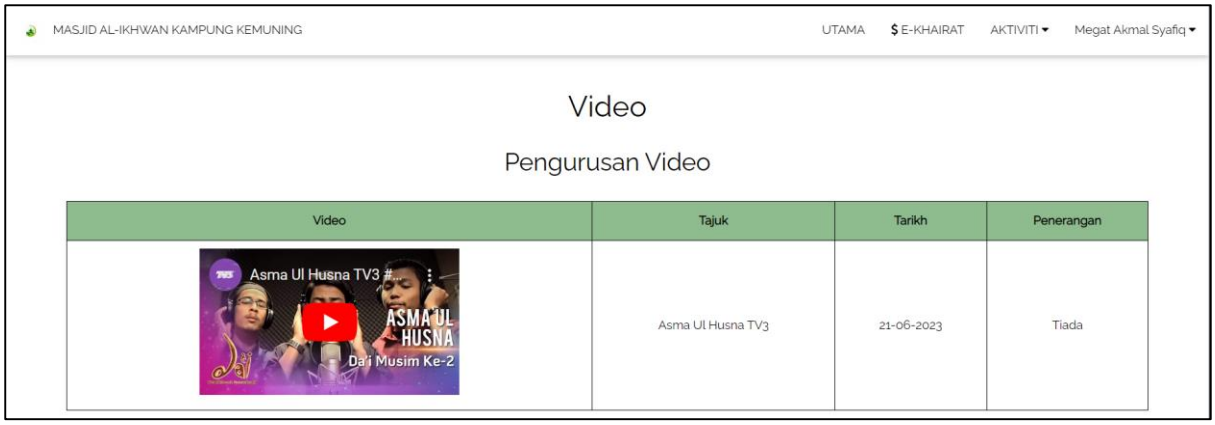

Figure 6: Video page interface (user)

In this page, a user does not need to login to access the video page. Users can just watch the video that has been added by the administrator. Figure 6 shows the video page interface for the user.

4.1.6 User Application Interface

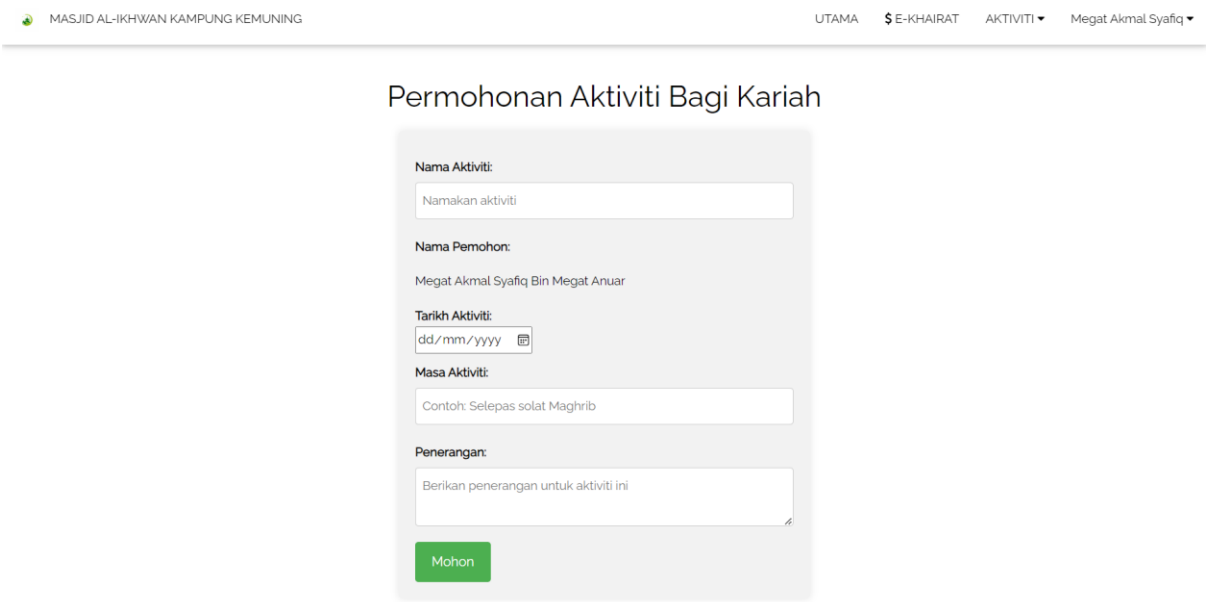

Figure 7: Application page interface (user)

In this application page, users need to login first before can access this page. Users need to enter the required information to make an application to the system. The name of the user will be automatically retrieved by the system and the administrator will know who the applicant is. Figure 7 shows the application page interface for the user.

4.1.7 User Profile Interface

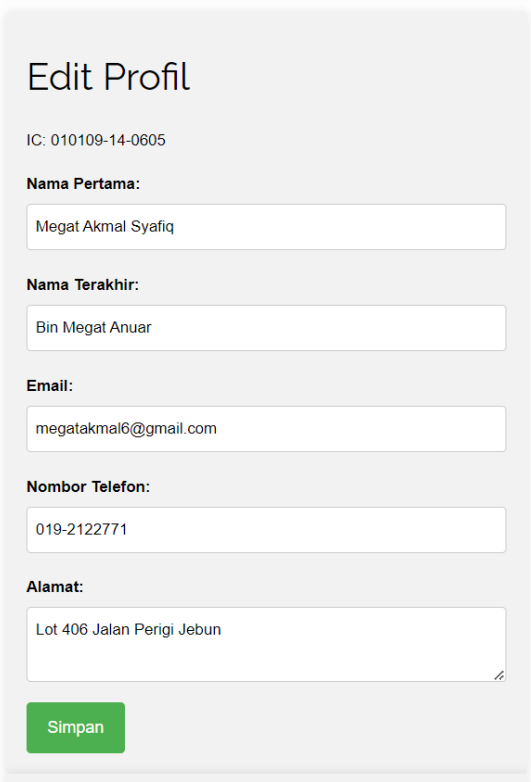

Figure 8: Edit profile page (user)

In profile page, the user can edit user information and then save the data by clicking on “Simpan”. Figure 8 shows the edit profile section for the user in profile page.

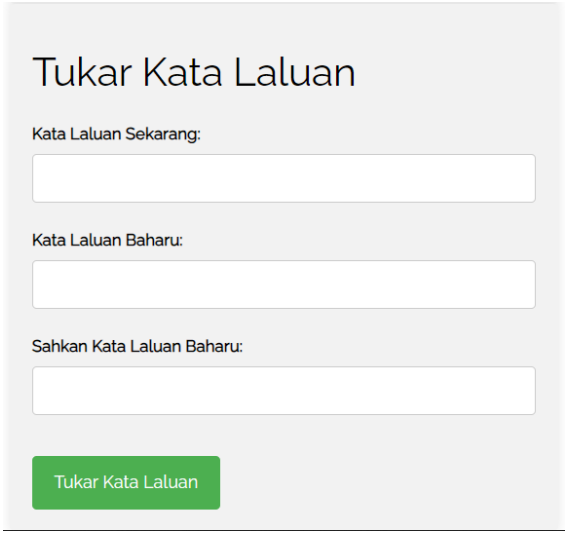

Figure 9: Change password (user)

In the profile page also, the user can change the account’s password by entering the user’s current password, and new password and then verify the new password. Then, the user just needs to click on “Tukar Kata Laluan”. Figure 9 shows the change password section for the user in the profile page.

4.2 Admin

In this section, there are several modules that have been implemented in the system for the administrator.

4.2.1 Admin Login Interface

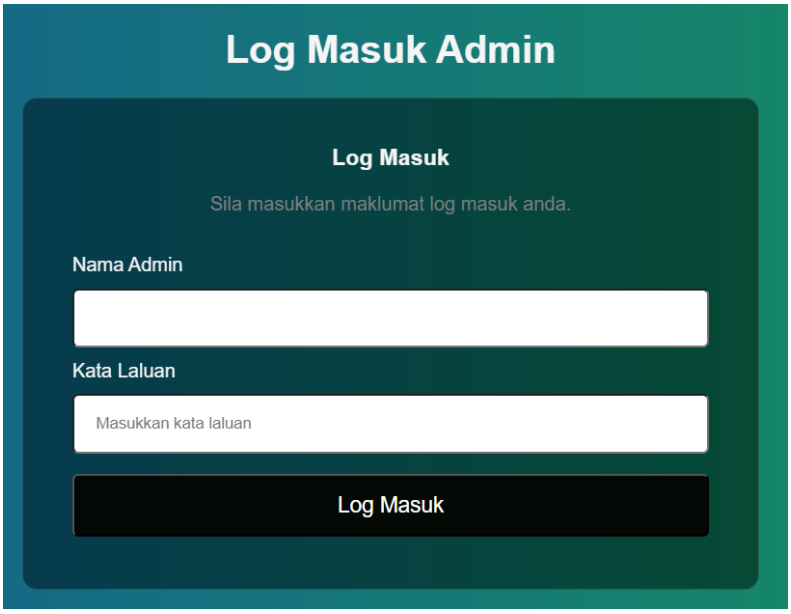

Figure 10: Login interface (admin)

For the administrator to login, the administrator needs to enter username and password. Both username and password must be correct based on the data that has been stored in database. If the user entered the wrong password and username the system will give the administrator error messages at the top of the login button. If the administrator entered the correct data, the administrator will be redirected to the dashboard. Figure 10 shows the login interface for the admin.

4.2.2 Admin Signup Interface

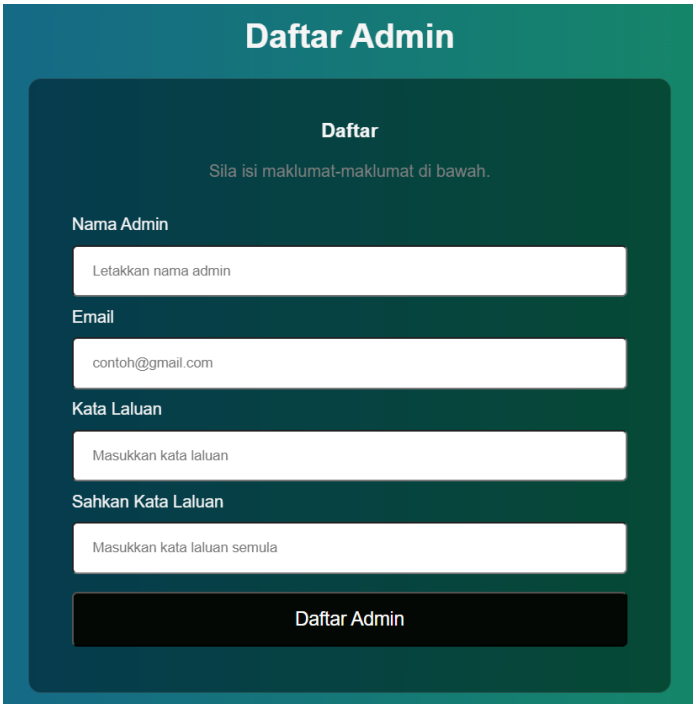

Figure 11: Signup interface (admin)

For signup module, the current administrator needs to enter other administrator information in order to create an account. But first, the current administrator needs to go to profile first to click on a button that will redirect to signup page for admin. Administrator need to enter the information correctly or else it will have error messages at the top of the signup button. If the administrator has entered the

information correctly, the administrator will be redirected to profile page again. Figure 11 shows the signup interface for the administrator.

4.2.3 Admin Dashboard Interface

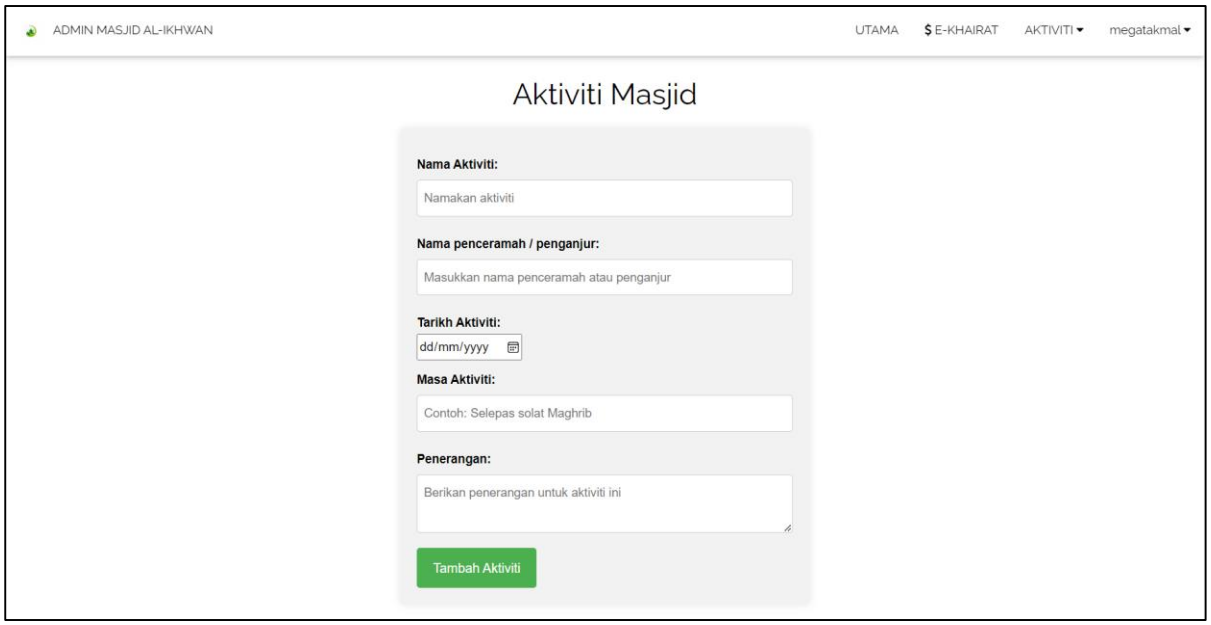

Figure 12: Add mosque's activity

The dashboard and all other pages can only be accessed if the administrator login. In the dashboard, there will be a section that allows administrator to add activity for the mosque. The administrator needs to fill in all the information before adding the activity into the system. Figure 12 shows the add mosque's activity section for the administrator in the dashboard.

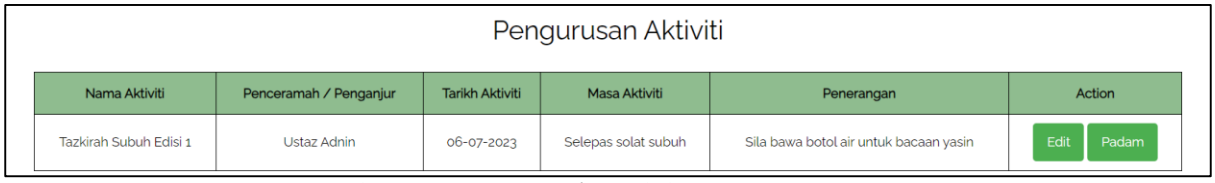

Figure 13: Mosque's activity management

The dashboard also has a section of the mosque's activity management that allows the administrator to edit the content of the activity or delete the activity. Figure 13 shows the mosque's activity management section for the administrator in the dashboard.

4.2.4 Admin E-Khairat Interface

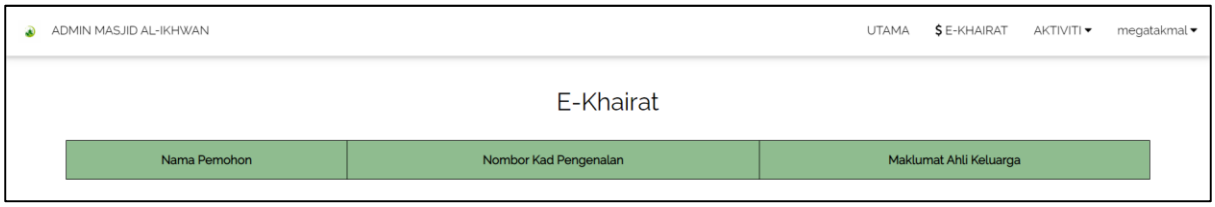

Figure 14: E-Khairat interface (admin)

Figure 14 shows the E-Khairat module for the administrator. In this module, the administrator gets the data from the user when the user has made any payment in the toyyibPay and the administrator can view the transaction from all users.

4.2.5 Admin Video Interface

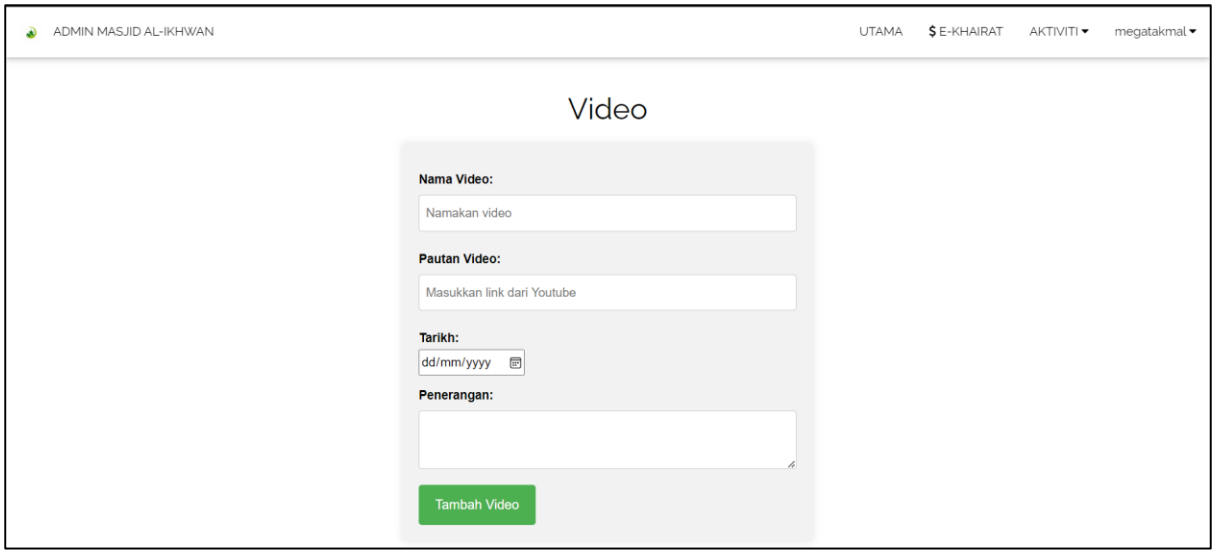

Figure 15: Video add

Figure 15 shows the adding video section for the administrator in the video page. The administrator needs to fill in all the information before adding the video into the system. The system uses Youtube link to save spaces in the database. The administrator also can add religious talk videos from Youtube by copying the link of the video.

Figure 16: Video management

Figure 16 shows the managing video section for the administrator in the video page. In this section, the administrator can edit the content for each video. Administrator also can delete the video if required.

4.2.6 Admin Application Interface

Figure 17: Application page interface (admin)

Figure 17 shows the application page interface for the administrator. This page retrieved the data from the user application page. The administrator needs to accept the application by clicking on the button "Terima" or reject the application by click on the button "Tolak". If the application is accepted, the application will automatically go to the dashboard in the activity section. If the application is rejected, the application will automatically be deleted from the database.

4.2.6 Admin Profile Interface

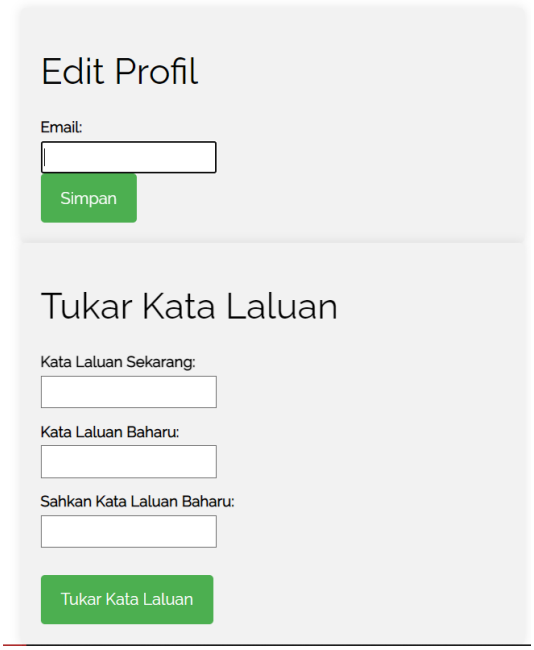

Figure 18: Profile page interface (admin)

Figure 18 shows the profile page interface for the administrator. The administrator can edit the email if they want to change it. For the password change, the administrator can change the account's password by entering the admin's current password, new password and verifying the new password. Then, the administrator just needs to click on "Tukar Kata Laluan". Figure 18 shows the change password section for the admin in profile page.

4.3 System Testing

4.3.1 User Acceptance Test

User acceptance testing (UAT), also known as application testing or end-user testing, is a stage of the software development process when the target user group tests the product in the real world [8].

Legend:

1- Very bad	2- Bad	3- Average	4- Good	5- Very good

Table 3: User acceptance test result for administrator interface

No	Feature	Percentage (%)				
		1	2	3	4	5
1	Registration and login	0	0	0	0	100
2	E-Khairat	0	0	0	30	70
3	Dashboard	0	0	0	0	100
4	Application form	0	0	0	10	90
5	Video	0	0	0	0	100
6	Profile	0	0	0	10	90

Table 4: User acceptance test result for user

No	Feature	Percentage (%)				
		1	2	3	4	5
1	Registration and login	0	0	0	0	100
2	E-Khairat	0	0	0	50	50
3	Dashboard	0	0	0	40	60
4	Application form	0	0	0	30	70
5	Video	0	0	0	0	100
6	Profile	0	0	0	10	90

5. Conclusion

In conclusion, the Management Information System and E-Khairat for Masjid Al-Ikhwan will help modernize the village mosque's service by transferring the traditional way to modern way which is a web-based system. The system has two types of users which are users (local residents and mosque committee members) and administrators. All the illustrated diagrams such as the context diagram, data flow diagram level 0 and ERD are surely helping in visualizing the Management Information System and E-Khairat for Masjid Al-Ikhwan Kampung Kemuning, functionality and all of the requirements needed in the system.

For future enhancement, this system needs to have a much more secure element. Which is in user signup, the name for the user needs to filter not to have any numbers or special characters. Other than that, when the program or activity has been done, the program or activity needs to be deleted automatically after one or two days. Finally, each error needs to have error message or error popup to notify the user of what is wrong with the input.

Acknowledgement

The authors would like to thank the Faculty of Computer Science and Information Technology, Universiti Tun Hussein Onn Malaysia, for its support.

Appendix A

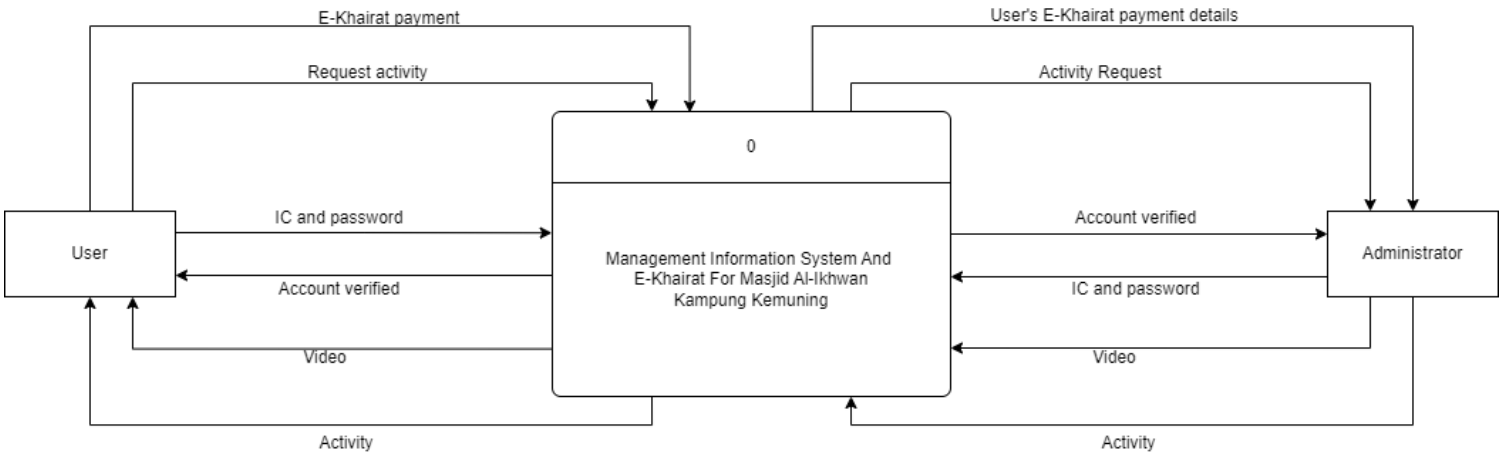

Figure A.1: Context Diagram of Management Information System And E-Khairat for Masjid Al-Ikhwan Kampung Kemuning

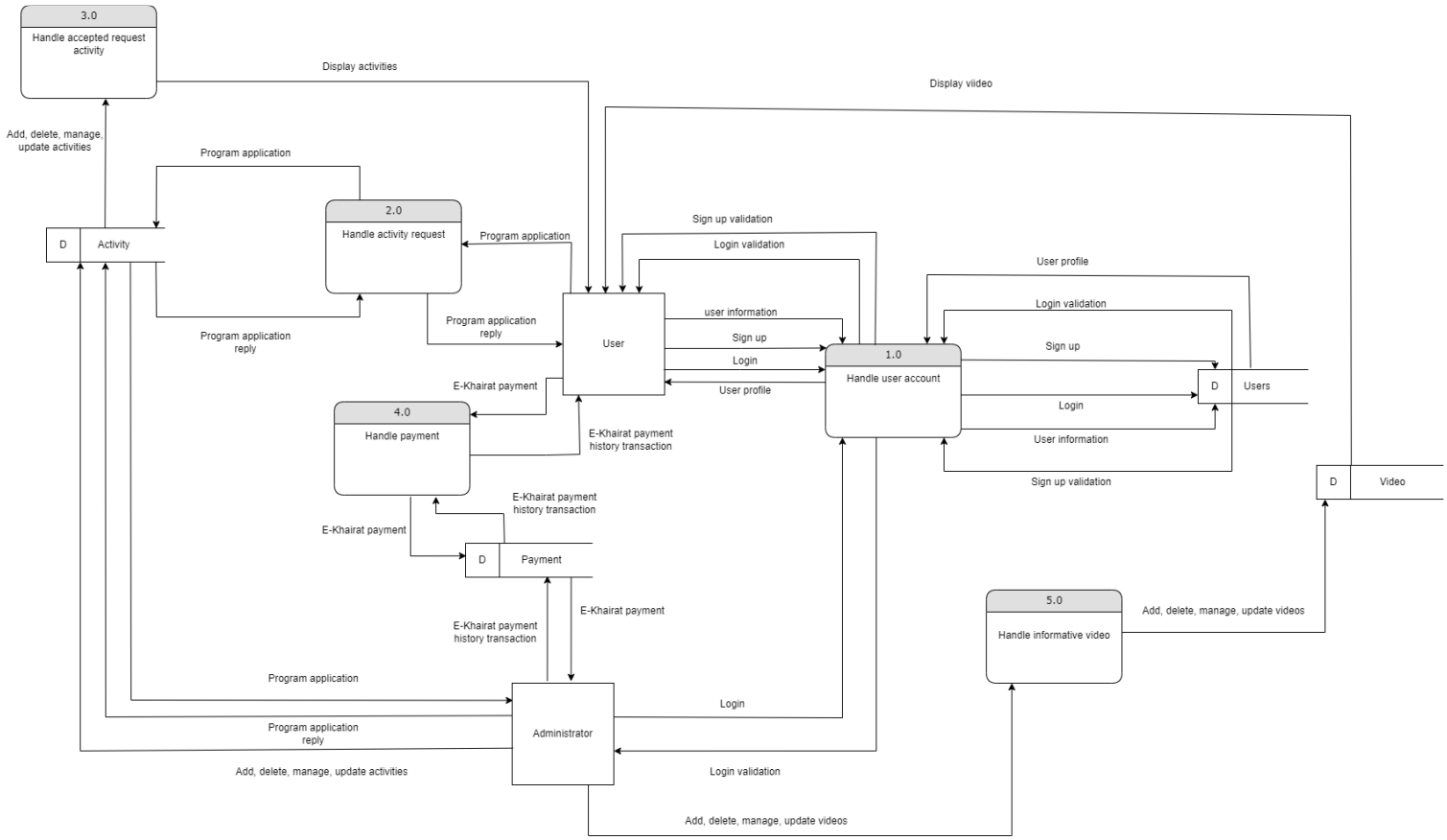

Figure A.2: DFD 0 of Management Information System And E-Khairat for Masjid Al-Ikhwan Kampung Kemuning

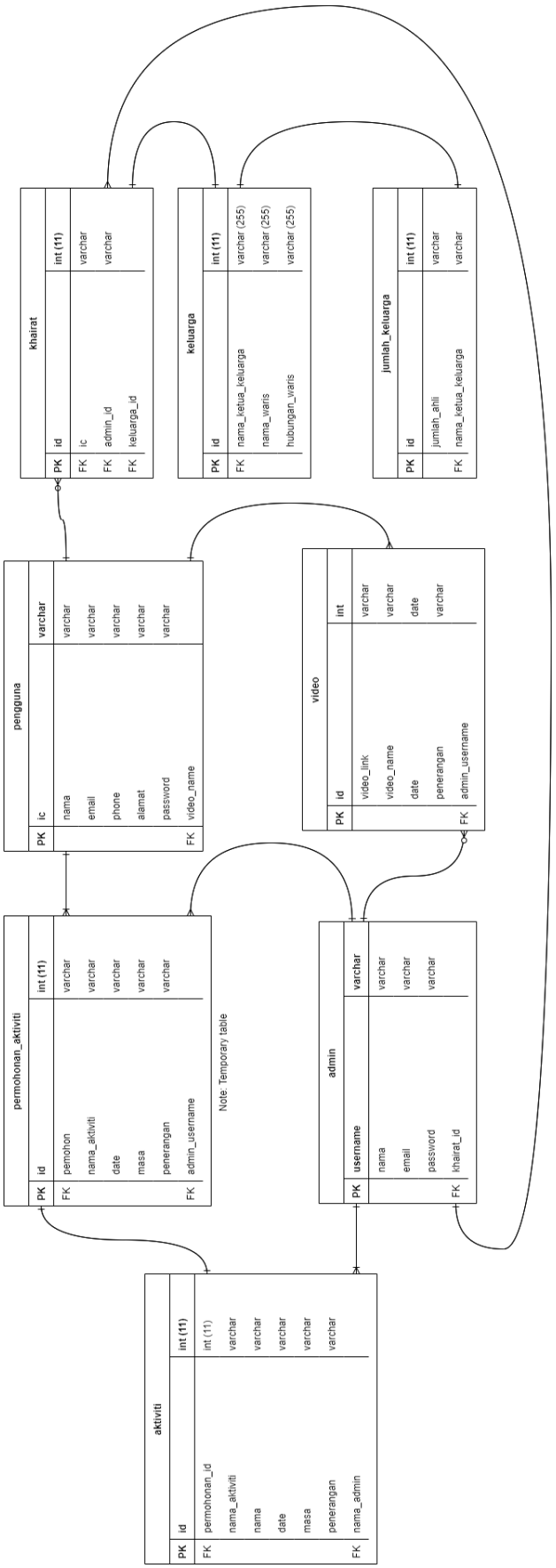

Figure A.3: ERD of Management Information System And E-Khairat for Masjid Al-Ikhwan

Kampung Kemuning

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