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Web based Hostel Management System for Sekolah Menengah Agama Parit Sulong

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Abstract: Hostel Management System is a system which has its' own database system and web interfaces. In today's era of technological advancement, there are hostels that do not have a hostel management system. This database system functions almost same as an application system that able hostel applicants by just fill in the form provided. It then sends the record to the database where hostel management in charge of the hostel can manage the records using a web interface designed to display all the records. This system also can be used by students to check their application and application status records. There were three objectives for this project. First was to design a website system to record hostel applicant application data. A website system designed to fulfill client requirements. Second, to develop a website system to record hostel applicant application data. This system focused on the hostel application process from the application until the result of the application. Lastly, to test a website system that record hostel applicant application data. One test performed with client to ensure the system works well. This database system is created using Adobe Dreamweaver 2021. The web system is created using free hosting service and to develop the web interface. This system helps hostel applicants, school admin and hostel management perform their respective roles only through this system without having any meetings during the application process.

Keywords: Hostel Management System, Computer Science, Programming, Web Technology

1. Introduction

With the rise in global warming and increasing pollution levels, it is becoming essential to find a viable alternative to use an efficient system. The use of paper has a negative impact on humans, animals and plants. More plants are needed to accommodate the use of paper. It also causes the habitat of animals to be disturbed. Therefore, online system is an alternative platform for very extensive paper usage task like the management of hostel application.

The aim of this project is to ease hostel management manage the hostel applicant's data, and hostel applicant can fill in the form online without go through complex process where hostel applicant needs

to fill a physical form to apply for the hostel and school admin need to attend a meeting to review the hostel application just like the current system.

Hostel Management System designed to manage data for hostel application. This system makes sure all the information and consistently and neatly organize the data. Therefore, they are be keeping well and safe and can be reviewed when necessary. The system content can be managed online and accessed without any complication whenever and wherever the user is [1]. This developed system can indirectly assist hostel management in controlling application data.

According to observation, Asrama Ibnu Sina of Sekolah Menengah Agama Parit Sulong (SMAPS) still using a manual system which is needed to write a formal letter to apply for a hostel and some of them need to fill a form that they get from school office. Some of them have time constraints to do that. Therefore, with this system can help them to make an application online. In addition, too many spaces needed in the office to sort all the physical form paper. With this system can help hostel management save space in their office with the form papers and application letters that have been sent by the applicant. According to the current system, the hostel management takes a long time to inform applicant about the status of their application via WhatsApp, Telegram or phone call. Thus, this system also helps them save time to notify the application status. By using this system, the status of the application will be notified, and the offer letter generated through this system.

The purposes of this project were to design and to develop a website system for hostel application and to test the proposed system functionality and usability.

This system developed using JavaScript, HTML and CSS for the front end while use PHP for the backend [2]. Most web servers, operating systems and architectures can deploy PHP, and many relational database management systems can be used. PHP functions mainly as a buffer, takes input from a file or stream containing instructions for text or PHP, and outputs another data stream. HTML will most often be the output, [3]. Adobe Dreamweaver 2021 is used during the development process that include write, test and debug code. Acer Aspire Windows 10 laptop used to do the development process.

This system has three target users which are, hostel applicant, school admin and hostel management. Hostel applicant who are the student from that school can apply hostel, school admin can update some of the application status, while hostel management can update the application status, the list of the application report, the list of school admin and hostel applicant users' details can be viewed by hostel management. All these users have the insert, delete, and update functions. A formal letter automatically generated for applicant if the application success.

This system has replaced the previous manual system. The amount of paper use during application process reduced by using the developed system. The developed system also helped in reduce the time consumption needed by hostel applicant and school admin.

2.   Related Work

2.1   Domain background

The developed system contained information about the availability, communication and others through online which hostel applicant can insert the details about the hostel application and the hostel management manage the application after the application be made. Previously, a manual system that used in Sekolah Menangah Agama Parit Sulong was a traditional method which hostel applicant need to request an application letter provided by the hostel at the school office itself. Then, hostel management check for the first phase of approval before interview. After that, any hostel applicant who passed for interview phase will be notified through phone call, WhatsApp or Telegram. After the

interview, the same methods were used by the hostel management to inform about the hostel admission approval.

The used of paper form is less efficient because the data stored cannot be recovered if anything happen such as fire. This is because it does not have a secondary storage for data unless hostel management request the same document from the hostel occupants. All records associated with all the users are recorded in a system. Besides that, information about the applications, all users are availability stored. This system can access by the users to login in the system. This is also can ease hostel applicant to check their application status.

2.2   Strong password

Strong password can consist of an upper case, lower case, number, and special character. The length, complexity, and stature combination of that can make sure the password is strong enough so that another user hardly guess for the password used. Usually, the minimum size for the strong password is eight. The bigger the size, then the password is more secure. Users need to know how to make the complex password to make sure the password is more secure. With the existence of strong password measurement on this system will help users know whether the password includes every feature of strong password or not. The system requires users to enter a password that includes the features mentioned earlier.

2.3   Comparison existing system with the proposed system

There are three existing systems that are similar to the proposed system. It is important to review the three existing systems to identify the advantages and disadvantages of existing systems and proposed systems. Therefore, by doing this comparative study, can help improve the proposed system. The existing management system for hostel as explained before are College Management System [4], Online Hostel Management System [5] and Hostel Management System [6]. Those three systems that have been selected are compared to the proposed system according to the features. All three systems mentioned above have very similar features and functions. Only the College Management System and Hostel Management System (proposed system) have a register function for hostel applicants. The improvements implemented in the proposed system are strong password measurement and able to generate offer letter for hostel applicant. The proposed system also adds one page to display SMAPS information and background. Finally, infographic information is also included in the same page. Table 1 below shows the comparison between existing systems and the proposed system.

Table 1: The comparison between existing systems and the proposed system

System Features	College Management System [4]	Online Hostel Management System [5]	Hostel Management System [6]	Hostel Management System (Proposed system)
Register page	Yes	No	No	Yes
Login page	Yes	Yes	Yes	Yes
Strong password measurement	No	No	No	Yes
Generate pdf file	No	No	No	Yes
Admin panel	Yes	Yes	Yes	Yes
User details management	No	No	No	Yes
Fee's module	Yes	Yes	No	Yes
Hostel information	No	No	No	Yes
Infographic information	No	No	No	Yes
Notification indicator	No	No	No	Yes

3. Methodology

System development methodology is defined as a way to improve the management and control of software and product development processes by determining the activities that need to be carried out using appropriate techniques. There are various types of models or methodologies in the software development life cycle (SDLC) such as prototype models, agile models and spiral models. Each has its own strengths and weaknesses. SDLC has been used throughout project development to plan, analyse, design, implement, test and deliver projects.

Waterfall model has been chosen in the development of this system. The waterfall model can implement the main phases that exist in the system development life cycle including the five phases namely Planning, Analysis, Design, Implementation and System. Figure 1 shows the phases of waterfall model.
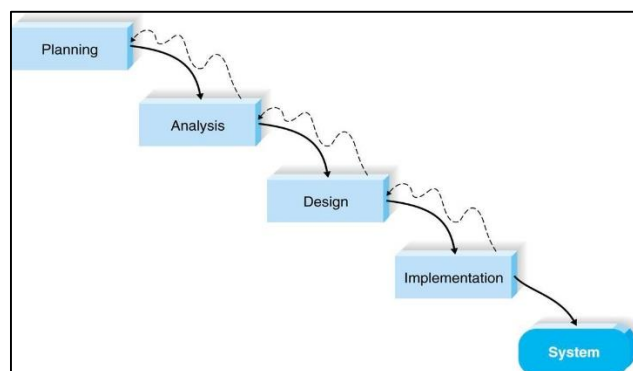
Figure 1: Waterfall model

Each phase must be done in sequence before proceed to the following phases. In every software development phase, there is implementation for the purpose of project documentation so that the result can be expected and improved. For a fix key reason, the small scales system and clear project requirements, this model was chosen [8].

There are five phases of the waterfall model. As shown in Table 2, each phase has its own tasks and findings that need to be generated during the overall development of the project.

3.1 Planning

In this phase, the activities involved are project planning before building it by defining objectives, identifying problems in the organization and the scope of the project to get the clearer plan. A Gantt chart was developed to help facilitate the planning of activities and the development period of the project. The requirements of the developed system have given an initial insight to the organization in this phase. Based on the observation, the hostel management is still using the manual system in recording the information of the applicant who made the hostel application at the school.

3.2 Analysis

This phase is to analyse the current needs and investigate any problems related to it. All information regarding information systems developed, collected and analysed in this phase in more detail after identifying the aspects in the initial phase, namely the planning phase. All of the tasks mentioned performed to collect information for this project, which was interviewed the school principal, Ustaz Mohd Fauziy and teacher who are responsible for managing SMAPS hostels, Ustaz Raja Musa. A clearer picture regarding the current hostel application process obtained through the interview. Interview questions can be referred to in Appendix A. In developing this system, all hardware and software need to be analysed in detail to ensure that it is appropriate.

3.3   Design

After the requirements have been collected, the design of the prototype interface and database is carried out. A system interface sketch has been implemented to help illustrate the system. In addition, the database has been designed based on the data that has been collected. The entire prototype system interface was designed using Microsoft Visio 2016 while the database and schedule schema were designed using Microsoft SQL Server Management Studio 18. The context diagram for this system as shown in Figure 2 shows the flows of the information between the system and the users of Hostel Management System. The DFD level 0 shown in Figure 3 that shows the basic overview of the whole system or process being analyzed or modeled. DFD level 1 and flowchart for Hostel Management System can be referred to in Appendix B and Appendix C.
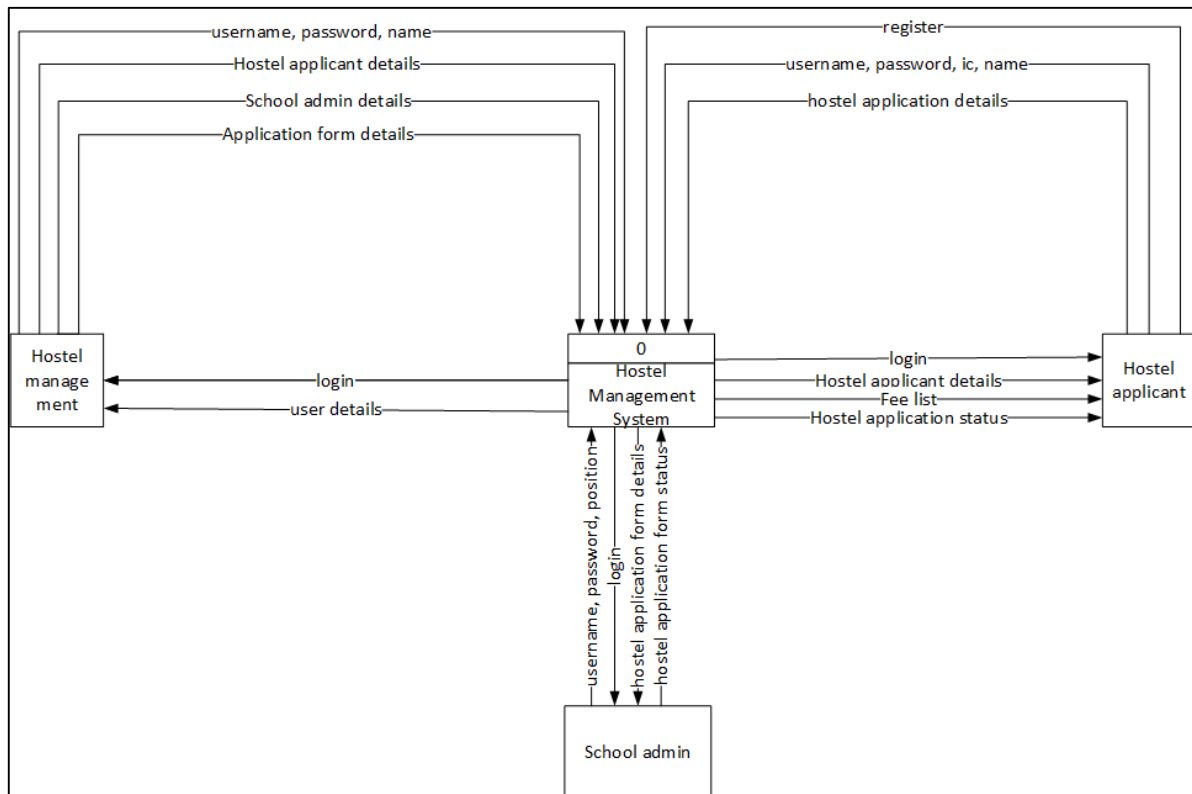
Figure 2: Context diagram
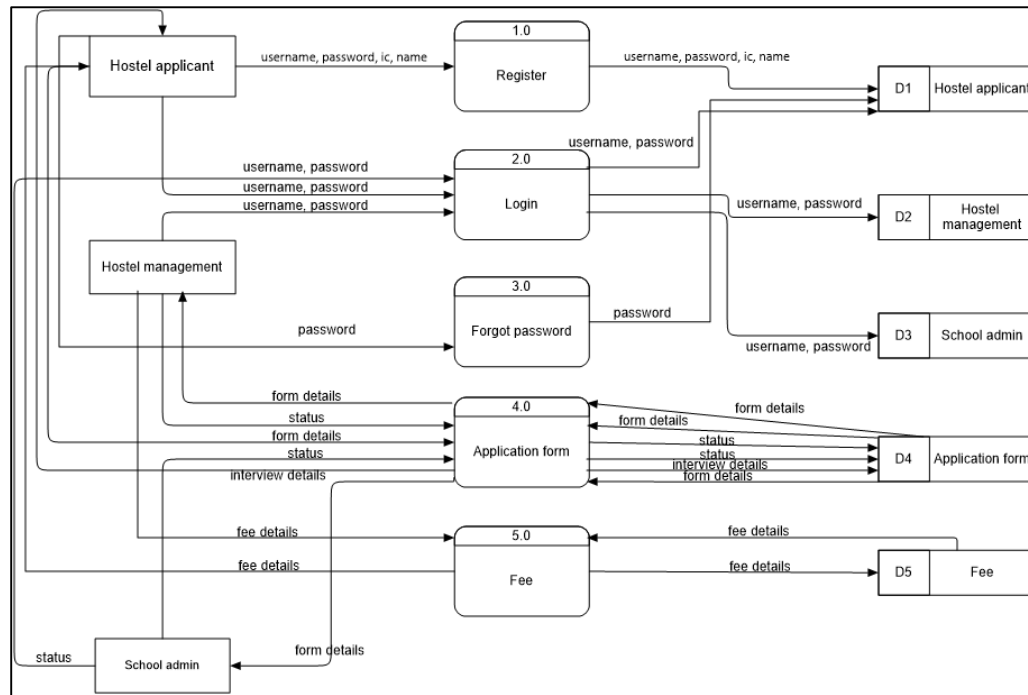
Figure 3: DFD level 0

Discussion with users has been done to get more details about the processes and other requirements so that they can provide ideas or suggestions and improvements to ensure that the system meets the needs and requirements of users. The interface of this system is very important and acts as a medium between the user and the system.

3.4   Implementation and testing

The implementation phase begins after the design phase has been completed. Next, software code according to the planning, analysis and design of the system that has been done generated in this phase. The action of creating the final system is by coding and debugging. System requirements documentation should be mandatory to refer to the entire other system development process to ensure the development project is in line with the needs or scope.

Upon completion of the implementation phase, a testing phase has been conducted to ensure that the Hostel Management System meets the user requirements and can be use without facing issues. The modules in this system tested for acceptance by the user to ensure that it meets the needs and requirements of the user who will use it. Documentation on the data created in the previous phase is referred back for the purpose of testing the accuracy of the data and the errors that exist.

As shown in Table 2, a system development workflow, each phase has its own tasks and findings that need to be generated during the overall development of the project.

Table 2: System development workflow

Phase	Activity	Finding
Planning	• Find and review project title • Project introduction • Create schedule • Estimate time	Gantt Chart
Analysis	• Identify problems • Specify the objectives • Determine the project scope • Undergo literature review • Do some research about system weakness • Get suggestion from target user • Analyze possible requirements	Analyse and manage the scope of the project, system requirements, software and programming language used.
Design	• Design problem statement • Logical design • Data flow design • Physical design	Interface and database design
Implementation and Testing	• Create system interface • Conduct testing phase to test functionality • Unit testing • Integration testing • User acceptance testing • Finding errors and missing operations • Determine whether the objectives are met • Identify problems that need improvement • Present project	System program code

4. Results and Discussion

The results of this project can be seen by conducting testing phase. Testing phase is conducted during and after the Hostel Management System is developed. A series of test cases were created based on system requirements. The system is tested with users. Prior to that, the system was tested by developers. This is to ensure that the program is free of any errors, bug fixes and is executed correctly as expected by the user. The further details of the testing phase result explained in section 4.2.

4.1 Interface

The system interface is the link between the user and the system. Therefore, the development of a single interface of a system that is easy to understand and user-friendly is very important in providing comfort and convenience to users when using this system. Behind the neat interface, there is programming code that is ready to process all the information and data entered by the user. The processed data will then be stored in a database.

Figure 4: Main page interface

Figure 4 is one example of an interface built for the Hostel Management System. The system homepage interface is the first page that will be displayed by the user before the next action is performed. The system interface has been developed based on the users and functions of the modules found in the system.

4.2   Test plan results

Each test case should be traceable to the requirements specified. The actual results for each test case were also recorded. They are simplified in Table 3.

Table 3: Test plan result

Test category	Description	Result
1	Test the system functionality: system authenticate login with true input and data.	As expected
2	Test the system functionality: system will store the data input.	As expected
3	System must allow add, view and delete. All these features must work successfully.	As expected
4	Test the system functionality: system can show error input message.	As expected
5	Test the system functionality: system can make communication between relation link and database.	As expected
6	Test the system functionality: system can make store and manipulate the application form data. System must allow add, view and delete.	As expected
7	Test the system accessibility: information on system can be read and display clearly.	As expected
8	Test the system accessibility: check whether the site is responsive or not.	As expected
9	Test the system browser support: check whether system compatible by many browsers.	Test on two different browsers only and work fine
10	System executes from start to end	Yes
11	User able to register and login	As expected

12	User able to view, add, delete, and update new user	As expected
13	User able to view, add, delete, and update user info	As expected
14	User able to view, add, delete, and update application status	As expected
15	User able to view, add, delete, and update fee details	As expected
16	Strong password measurement works	As expected
17	System works smoothly	As expected

4.2   Discussions

After the testing phase be made, some discussion with end user held. User acceptance testing form is to determine the extent of user satisfaction while using the system. Any improvements can be made by refer this form. User acceptance testing form for this system showed in Table 4 below.

Table 4: User acceptance form result

Test category	Description	Test	
		Pass	Fail
1	System authenticate login with true input and data	/	
2	Print out error message when wrong username and password	/	
3	System stores the data input	/	
4	System can show error input message when wrong input new user	/	
5	System can make communication between relation link and database	/	
6	System can store and manipulate the application form data. System must allow add, view and delete	/	
7	Information on system can be read and display clearly	/	
8	System executes from start to end	/	
9	User able to register and login	/	
10	User able to view, add, delete, and update new user	/	
11	User able to view, add, delete, and update hostel management user info	/	
12	User able to view, add, and update application status	/	
13	User able to view, add, delete, and update hostel applicant user info	/	
14	User able to view, add, delete, and update fee details	/	
15	Strong password measurement works	/	

Testing are the most important phases in software development. This is to ensure that the system is developed in accordance with the objectives and requirements that have been collected. Thus, the system will produce actual results as expected during the beginning to the end of system development. To meet the requirements, Adobe Dreamweaver 2021 has been used to implement all system features. Additionally, a database for the system was created using phpMyAdmin. Finally, the system was tested together with end users to identify defects on the system.

5.   Conclusion

After completion all phases of software development and final decision gathering during testing activities with end users, it can be concluded that this system has several advantages and disadvantages. The first thing that will be discussed is the advantages of this system. First of all, this system allows users to manage details information of all categories of users including all application records which is important for hostel management of SMAPS to manage in the management of admission applications to the hostel. Second, application forms can be made from this system to make it easier for hostel applicants, the school admin for the hostel management to record details and information related to each category of users. What is more, the hostel management application form used to provide approval of the application as well as information on fees. After that, the previous application form record stored in the database can be view by user. Third, the advantage of this system is that this system can provide

hostel management to manage all school admin and hostel applicant notices. Hostel management can add, update, view and delete school admin notices with just one click action. Fourth, notice of fees can be managed using this system by providing functions for hostel management to add, update and delete. In addition, there is an indicator notification in this system that is presented only for school admins and hostel management which shows the status of the application that needs attention. Other than that, this system can generate an offer letter for hostel applicant if the application for admission to the hostel has been approved by hostel management. Lastly, there is a strong password measurement in this system to ensure that users enter a more secure password.

This system also has several weaknesses. The first is that this system does not have a search and filter function. This feature is important to make it easier for users to find an information easily. In addition, this system does not have an interface that follows the latest technology and responsive. Although this system has some weaknesses, it will not affect the overall functionality and quality of this system. This system can still provide many advantages to users and will help manage their application matters. These are just suggestions that may bring improvements to this system in the future. The first suggestion is that the system will be improved by improving the interface design that is more user friendly to follow the latest technology. The second suggestion is that the system will be able to provide online payment for fee payment. This will make it easier for users without having to provide cash for the payment session during hostel admission registration day. The third suggestion is that the identity card tracker can be integrated with the system to help users enter new applicant information or search for applicant information more easily and effectively. Other than that, the barcode reader can also be integrated with the system to quickly access fee information without having to login into the system first. These are some of the recommendations that have been prepared and explained. This proposal is very important to improve this system to continue to work in the future and hopefully bring benefits to users. In conclusion, Hostel Management System ease the hostel application process in Sekolah Menengah Agama Parit Sulong. The application can be made online without need the user to make any meeting. The application form review that usually made by school admin also can be made by only using this system. Hostel applicant can know the application result by checking the result in this system. With all these functions, proved that Hostel Management System helps all users of this system by saving their time.

Acknowledgement

Appendix A

Interview Form for Hostel Management System

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Interview Form for Hostel Management System

Date: _____

Teacher's Information

Name :_____

Position: _____

Interview Question

1) Explain a little about the organizational background

2) What is the mission and vision of this school?

3) What is the current / used system?

4) What is the hostel application information stored?

5) What user information is stored?

6) How many people are involved in the process of receiving hostel applications?

7) Who is responsible for receiving hostel applications?

8) Does the form need to be printed by the applicant?

9) What is the application process that is being implemented?
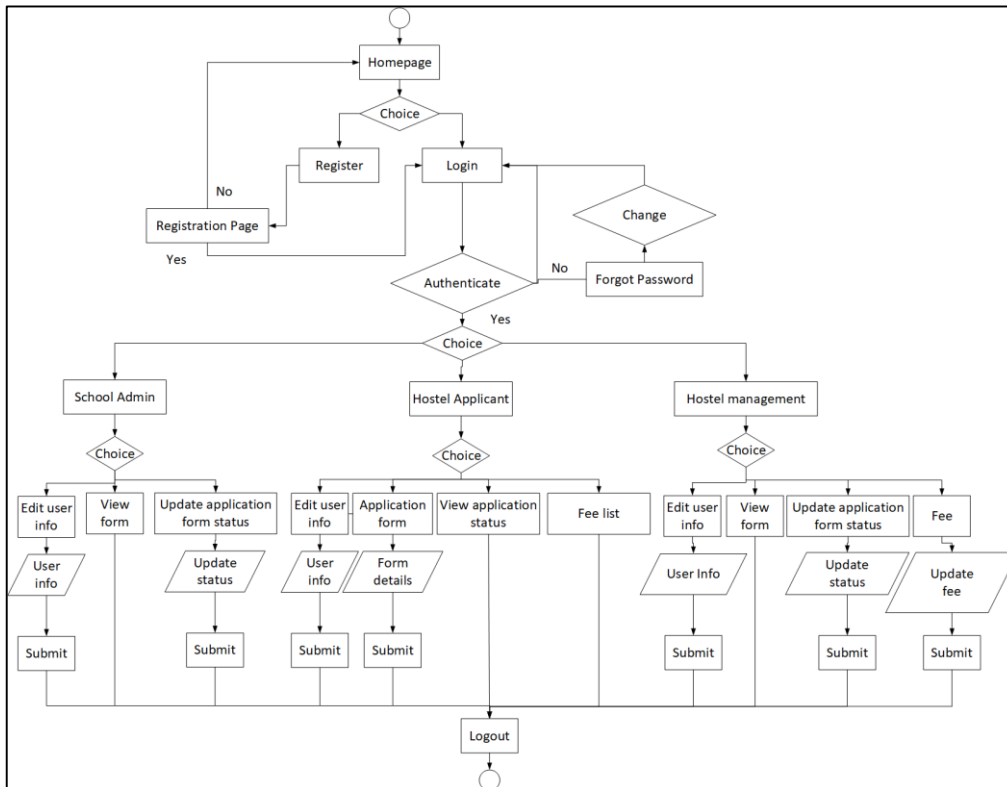
10) What system do you want to build?

</div>

Appendix B

DFD level 1 for Hostel Management System
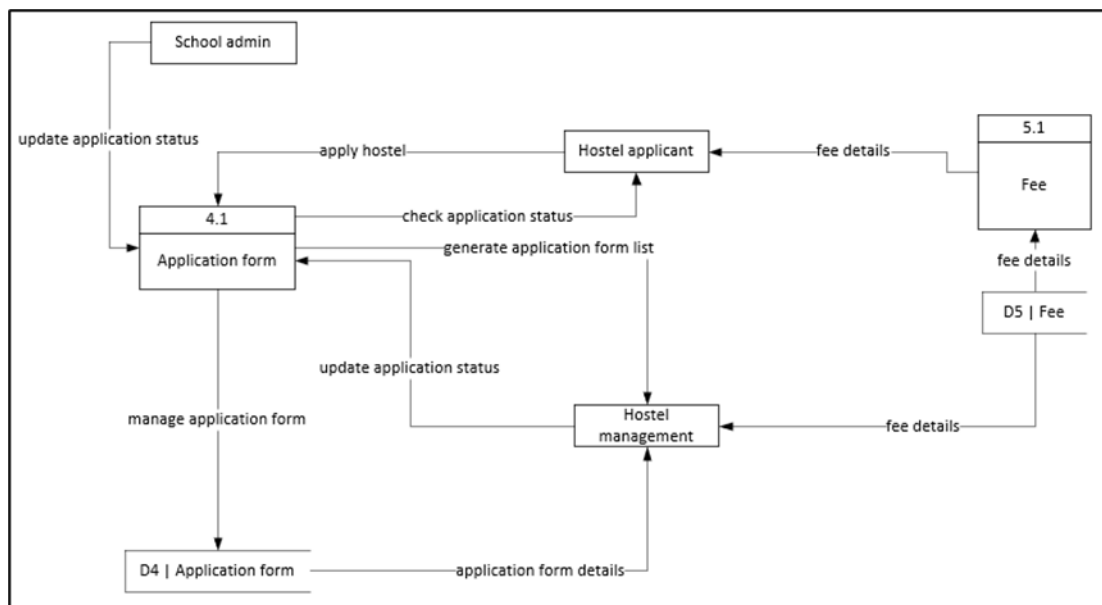
Appendix C

Flowchart for Hostel Management System

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