

Research Article

# An Automated System for Student Health Care Room Utilization and Availability: A Case Study Machang, Kelantan

Nur Ainatul Mardiah Mat Nawil<sup>1, \*</sup>, Huda Hamidon<sup>2</sup>, Khadijah Abdul Rahman<sup>3</sup>, Nurizan Yusof<sup>4</sup>, Azma Ariana Paizon<sup>5</sup>, and Mariah Asyikin Abd Rahman<sup>6</sup>

<sup>1</sup> Universiti Teknologi MARA; ainatulmardiah@uitm.edu.my;  <https://orcid.org/0000-0002-5868-4535>

<sup>2</sup> Universiti Teknologi MARA; huda685@uitm.edu.my;  <https://orcid.org/0000-0002-7667-0743>

<sup>3</sup> Universiti Teknologi MARA; khadijah10@uitm.edu.my;  <https://orcid.org/0000-0002-9183-5622>

<sup>4</sup> Universiti Teknologi MARA; nurizanyusof00@gmail.com

<sup>5</sup> Universiti Teknologi MARA; azmaariana@gmail.com

<sup>6</sup> Universiti Teknologi MARA; thenamemariah@gmail.com

\* Correspondence: ainatulmardiah@uitm.edu.my; +60145142921.

**Abstract:** Medical facilities in school premises are essential because they are the first line of defense for students who need medical care in class. Based on the study, the findings indicate that the current manual process for capturing student data is at risk to damage and errors, so inaccurate data can be recorded. In addition, existing manual system makes it impossible to track student locations and manage sickbed usage. The objective of this project is to create an automated system to take the place of the manual procedure used to gather student data and control entry to the medical room. This system was developed to aid Sekolah Menengah Kebangsaan Hamzah 2 management in keeping track of sickbed and medical room utilization. The planning, analysis, design, implementation, and maintenance phases of the System Development Life Cycle (SDLC) are all included in the creation of the School Healthcare Room (SHROOM) System. The system's interface was thoughtfully designed to improve usability and user experience. The study's findings indicate that both teachers and students valued the system, proving that it has the ability to improve sickbed management operational effectiveness. Overall, the SHROOM system has the potential to assist schools in improving the attention that given to their students as well as the way they allocate their resources.

**Keywords:** sickbed management; school; automated; medical facilities.



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## 1. INTRODUCTION

The presence of healthcare facilities in schools is essential for fostering kids' overall well-being and academic success. Dedicated areas or rooms within educational institutions that are specially created and furnished to offer medical assistance, support, and health-related services to students are referred to as healthcare facilities in schools. These facilities have trained healthcare staff, such as school nurses or healthcare aides, who are in charge of attending to the medical requirements of the students, providing first aid, managing chronic conditions, promoting health education, and liaising with parents and outside healthcare providers.

Schools with on-site medical facilities can provide immediate care for accidents, diseases, and other situations that might arise during the school day. They have basic medical supplies, first aid equipment, as well as specialized equipment for handling particular illnesses. Private examination rooms, drug storage spaces, and areas for health screenings and evaluations may also be included in these facilities.

The main goal of the healthcare facilities in schools is to protect students' health and wellbeing while they are on school grounds. A variety of services should be offered by these facilities, including as first aid for minor accidents, management of chronic health disorders, medication administration, health promotion and education, prevention and early intervention, and assistance with emotional and mental health.

The availability of healthcare services in schools makes it easier for students to seek immediate medical treatment, ensures that their medical needs are met, and supports them in preserving their well-being and academic achievement. These resources aid in establishing a secure and supportive learning environment that emphasizes pupils' well-being and general development. Besides, it seems crucial to improve school health services with teachers' and educators' full involvement (Qureshi, 2018).

The study by Omar et. al. (2015) indicate that the health services offered at schools should be more thorough and targeted. Teachers need training because they were discovered to be the primary responders in cases of student illness or injury. The current school health programme ought to be applied in both public and private schools.

## **2. PROJECT OVERVIEW**

The School Healthcare Room System is a system for keeping track of the information on students who use the healthcare facility. Through the use of this system, students may complete out an application before utilizing the healthcare room, and the teacher of the class will receive a notification email on the student's status. Students will feel more at ease because they don't have to explain their absence to their teacher.

### *2.1 Project Objectives*

The objectives of the system are including:

- i. To record the usage of healthcare room
- ii. To record accurate information.
- iii. To secure the data.
- iv. To easily notify class teachers the presence of students in healthcare room.
- v. To develop system that ease student, teacher, and hostel management

### *2.2 Project Scope*

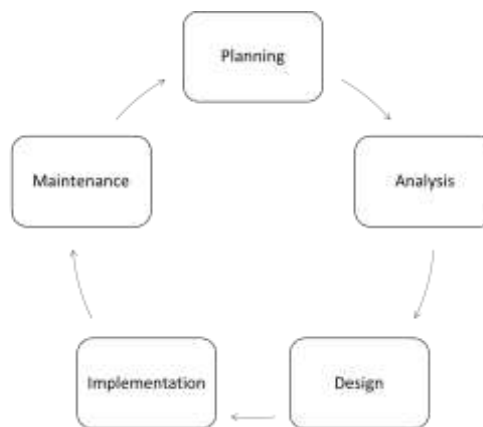
A project's scope is a comprehensive listing of all its components, including all pertinent tasks, materials, deadlines, and deliverables as well as the project's parameters (Alexander, 2020). Project scope plays a role in the decision of whether or not to proceed with the project. In terms of SHROOM system development, this system was created in order to help Sekolah Menengah Kebangsaan Hamzah 2 school management in keeping track of medical room sickbed usage records. Students may fill out the healthcare room's use information, including the date, time, and reason for use, using this method.

To ensure that their teacher is informed of their student's condition, a notification email will send to them. This enables class teachers to be aware of students' presence as well as school administration in managing records. The goals of this project is to develop an automated system to replace the manual procedure used to collect student information and manage access to the healthcare room. The current manual method of capturing student data is at risk of error and damage, which leads to the collection of inaccurate data.

Additionally, it is impossible to manage sickbed utilisation and track student locations using the current manual method. Hence, an automated system will be created to replace the manual method of recording student information. The system should be intended to ensure that the data that is recorded is accurate and error-free. The technology should then provide a means to control sickbed usage and monitor student location. The system ought to be easy to use and open to all permitted users. The technology should then provide a means to control sickbed usage and monitor student location. The system should be user-friendly and accessible to all allowed users. The system should provide a secure storage option to reduce the likelihood of loss or damage.

### 3. METHODOLOGY

Following Rosman et. al (2010), the SHROOM System is developed following several empirical stages. First, the authors conduct a review on the existing forms, procedures and reports. Second, interview sessions were conducted with the stakeholders which are school administrations, teachers and students. Lastly, in order to have a structured process, the System Development Life Cycle (SDLC) is used as a methodology in developing the SHROOM System. The SDLC comprises of five (5) stages which are including planning, analysis, design, implementation and maintenance (Hoffer et al., 2017). Figure 1 shows the overall phases in SDLC.



**Figure 1.** System Development Life Cycle (SDLC)

#### 3.1 Planning

The allocation of resources, planning for project capacity, project scheduling, cost projection, and provisioning for the SHROOM System are all part of the planning phase of project and product management. Planning is essential to a successful project while designing a system. This stage involves identifying the issues, gathering information from multiple sources, and conducting research on the suggested system. It is also a component of the project that develops the project strategy, which establishes the project's general direction.

### *3.2 Analysis*

The analysis phase is the second phase. In this stage, a preliminary investigation is being carried out to determine the nature of problems and the specifications required for the new system. Thus, the interview session is being held to comprehend the current procedure and to compile requirements. Additionally, the current forms, reports, and procedures are being examined throughout this phase.

### *3.3 Design*

Developers start creating the SHROOM System once they have a good understanding of the requirements. A thorough design is created at this point, and the hardware and software are being identified. The researcher produces detailed diagrams at this phase, including Data Flow Diagrams (DFD), Entity Relationship Diagrams (ERD), and Contextual Diagrams (CD). The following diagrams will aid in clarifying the details of the SHROOM System's data structure. In addition, the user interface is being created throughout the design phase. This will serve as a guide for the development process and ensure that the system is user-friendly and simple to use.

### *3.4 Implementation*

The implementation phase focuses on how users will utilise the system and carry out the function. This stage is crucial in order to be sure that the system will be implemented appropriately and effectively on that particular device. The main activity in this implementation phase is writing code from scratch, and the most crucial thing is that it meets user expectations and avoids serious program faults to make sure the system functions properly. At this point, it involved setting up the hardware and software including Laragon, MySQL, phpMyAdmin, Sublime Text, and Visual Studio Code. Additionally, the implementation step is crucial for identifying system functionality and confirming that it performs as intended and as stated.

### *3.5 Maintenance*

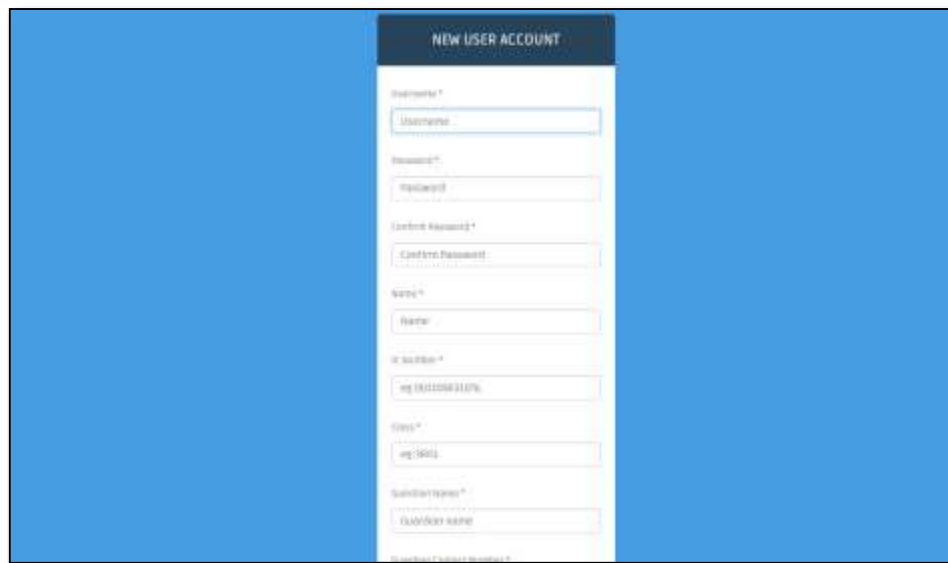
The SDLC's maintenance phase comes last. Researchers employed corrective maintenance, adaptive maintenance, and perfective maintenance to maintain the SHROOM System. After the system has been implemented into use, the maintenance phase starts. The researcher did various improvements and bug fixes during this period.

## **4. PROJECT INTERFACE DESIGN**

Interface design is a crucial aspect to facilitate interaction between the system and users and a well- designed interface could also boost users' satisfaction (Nordin et al., 2022). The interface design of the SHROOM System is concentrated on developing a user-friendly and effective platform that facilitates effortless interaction between the users. To improve usability and maximise the overall user experience, the design elements are meticulously designed. Additionally, the system makes use of easy-on-the-eyes colour schemes with simple design elements.

#### 4.1 Registration Interface

This interface allows new users to register an account by providing the details such as username, password, name, IC number, class guardian name and contact details.

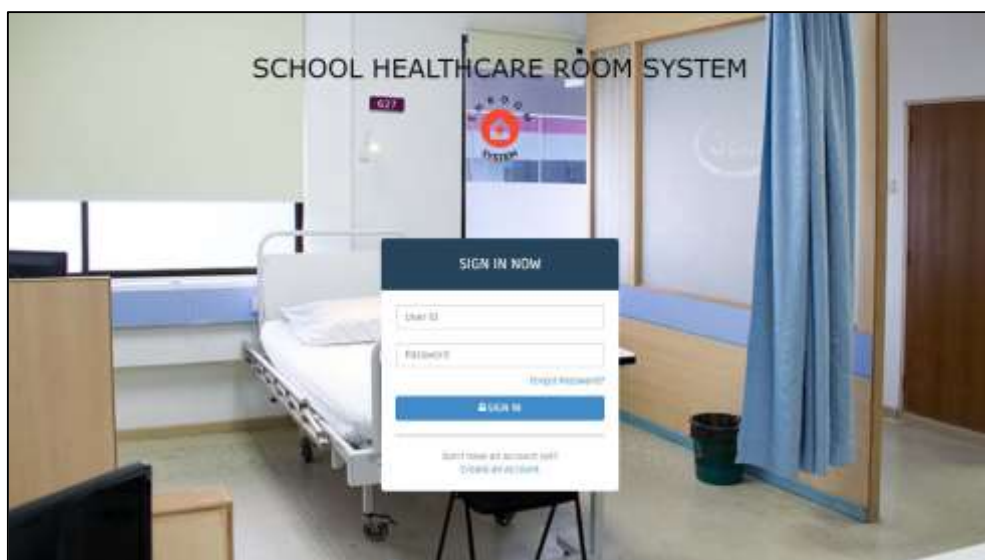


The screenshot shows a web-based registration form titled "NEW USER ACCOUNT". The form is set against a blue background. It contains the following fields: "Username\*" with a placeholder "Username", "Password\*" with a placeholder "Password", "Confirm Password\*" with a placeholder "Confirm Password", "Name\*" with a placeholder "Name", "IC Number\*" with a placeholder "eg: 8123456789010", "Email\*" with a placeholder "eg: S@S@S", and "Guardian Name\*" with a placeholder "GUARDIAN NAME". At the bottom of the form is a blue button labeled "REGISTER".

**Figure 2.** Registration Interface

#### 4.2 Login Interface

This login page required users to enter user id and password. Users can also sign up for an account through the link provided in this page.

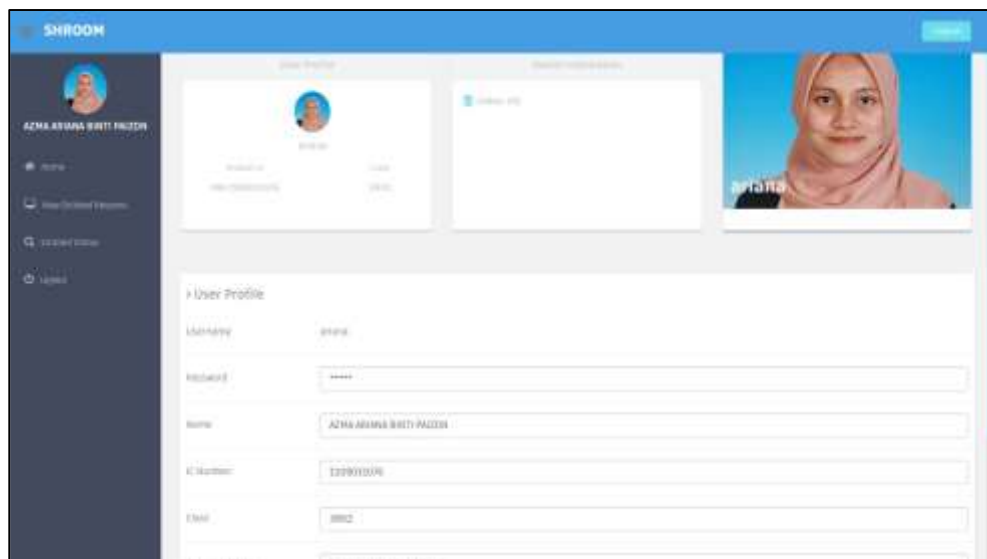


The screenshot shows a login interface overlaid on a background image of a school healthcare room. The login form is titled "SIGN IN NOW" and includes fields for "User ID" and "PASSWORD". Below the password field is a link that says "Forgot Password?". A blue button labeled "SIGN IN" is at the bottom of the form. The background image shows a room with a hospital bed, a desk, and a sign that reads "SCHOOL HEALTHCARE ROOM SYSTEM".

**Figure 3.** Login Page Interface

### 4.3 Profile Interface

This interface will display the student's records including the current health information and status.



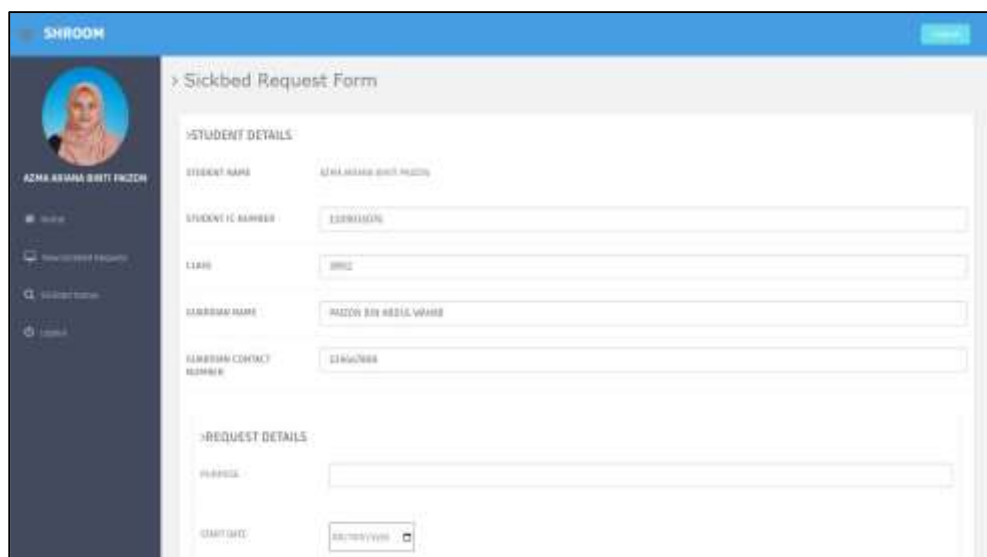
The screenshot displays the SHROOM application's profile interface. On the left is a dark sidebar with the user's name 'AZMA ARIANA BINTI PUZIAH' and navigation links for Home, New Student Records, Sickbed Status, and Logout. The main content area has a top section with a 'Logout' button and a 'Student Information' tab. Below this is a 'User Profile' section with the following details:

|           |                          |
|-----------|--------------------------|
| Username  | azma                     |
| Password  | *****                    |
| Name      | AZMA ARIANA BINTI PUZIAH |
| IC Number | 123456789                |
| Email     | azma@shroom.edu.my       |
| Class     | BMSC                     |

**Figure 4.** Profile Interface

### 4.4 Sickbed request Interface

This interface will display the sickbed request form. This interface will record the request information including the student's details, purpose and date.



The screenshot displays the SHROOM application's sickbed request form. The sidebar is identical to the previous interface. The main content area is titled '> Sickbed Request Form'. It contains two sections:

**>STUDENT DETAILS:**

|                         |                          |
|-------------------------|--------------------------|
| STUDENT NAME            | AZMA ARIANA BINTI PUZIAH |
| STUDENT IC NUMBER       | 123456789                |
| CLASS                   | BMSC                     |
| GUARDIAN NAME           | PUZIAH BINTI HUSLIMAH    |
| GUARDIAN CONTACT NUMBER | 0123456789               |

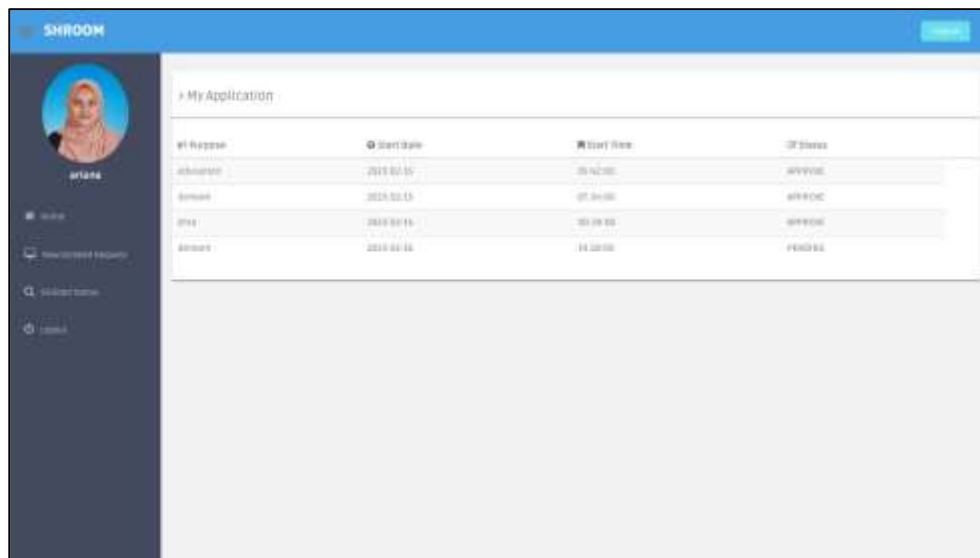
**>REQUEST DETAILS:**

|            |                                         |
|------------|-----------------------------------------|
| PURPOSE    | <input type="text"/>                    |
| START DATE | <input type="text" value="2023/11/01"/> |

**Figure 5.** Sickbed Request Interface

#### 4.5 Sickbed Application Status Interface

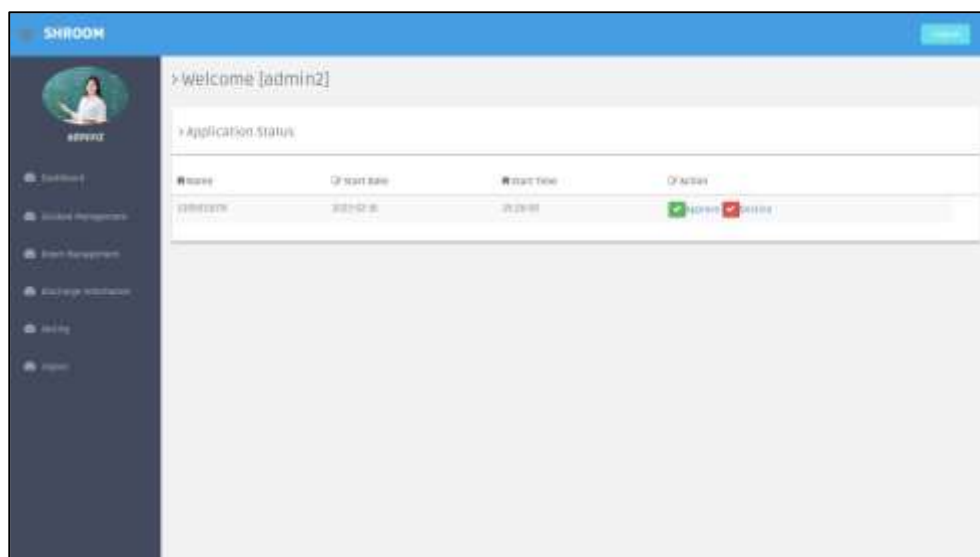
This interface will display the application list and the application status.



**Figure 6.** Sickbed Application Status Interface

#### 4.6 Sickbed Management Interface for Admin

This interface will display the application list and the application status for admin. Through this page, Admin or teacher in charge can approve or decline the request.



**Figure 7.** Sickbed Management Interface for Admin

#### 4.7 Room Management Interface for Admin

This interface allows the admin or teacher in charge to manage the availability of the room. Through this interface, the management can identify the status and availability of the healthcare facilities provided in the school premises.

**Figure 8.** Room Management Interface for Admin

#### 4.7 Discharge Record Management Interface for Admin

This interface allows the admin or teacher in charge to record the discharge information of the students.

**Figure 9.** Discharge Record Management Interface for Admin

## 5. CONCLUSION

Issues with records management were highlighted in this paper. The SHROOM System is an information system created with the goal of improving the procedures for sickbeds' utilization in schools. However, in addition to universities, the system might be utilised or distributed to other schools. The system's features could occasionally be updated to meet the needs of the stakeholders.

SHROOM System has been demonstrated to be effective and beneficial in enhancing organizational management. The functions it provides have been modified and improved over time to meet the organization's shifting demands and requirements. Although a number of issues have been raised, the system's developers are committed to finding solutions so that the organisation can keep gaining advantages.

The SHROOM system offers schools many benefits, including improved communication, increased productivity, and improved student health. The system has limitations, but the developers are committed to find solutions to these limitations. Future improvements to the system could include integration with electronic health records, the use of data analysis and forecasting to better predict disease outbreaks, and others. Overall, the SHROOM system has the potential to help schools provide better care for their students and make better resource allocation decisions.

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