

Abstract

In an era of digital transformation, traditional ID cards pose limitations in convenience and efficiency for college students. Traditional ID cards are inconvenient and inefficient for college students. The current canteen, library, and transportation subscription systems all use physical ID cards to make payments. However, this process can be tedious and error-prone, causing inefficiencies in college operations. The purpose of our team “Code Crafters” is to establish “iCardSIS”, a digital platform that combines a digital student identity card stored on the student’s mobile phones with a comprehensive system for managing student information. It aims to address these issues by allowing students to access the canteen, keep a track of library books, get transportation subscriptions and recharge their card balance all through a single app. We chose the web development of the program using HTML, php, CSS and JS to fulfill the task of providing a remote access to each data and also viable options for the admins to supervise. We also chose the Flutter framework to create a user-friendly interface for the system, assuring compatibility and smooth performance across numerous devices. Use of MySQL and python are to be done in numerous occasions of transferring data through web servers. By implementing the “iCardSIS ” we expect increased efficiency in the canteen operations, reduced administrative burdens, convenience for students and enhanced security in handling transactions. Instead of carrying physical ID cards, students can simply use their digital cards stored in the iCardSIS system.

Keywords: HTML, CSS, php, JS, MySQL, python

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Acronyms/ Abbreviations

GUI: Graphical User Interface

HTML: HyperText Markup Language

SQL: Structured Query Language

SIS: Student Information System

VSC: Visual Studio Code

CSS: Cascading Style Sheets

PHP: Hypertext Preprocessor

Chapter 1: Introduction

"iCardSIS" is a composite word with two parts. The term "iCard" implies the system's digital identity card, focusing on its modern, digital nature. The word "SIS" stands for "Student Information System," and it refers to the entire software suite used to manage and organize student data. Combining these two elements, the name suggests the system's dual use as an ID card and a student information management tool. Transactions become more convenient with iCardSIS, as does library management.

1.1 Background

Higher education is experiencing a significant digital transition, with schools adopting modern technologies to improve college operations. Recent developments in the sector emphasize the importance of modernizing college systems to improve productivity and usability for both students and staff. Traditional methods of managing student identities, information, and transactions, such as physical ID cards and manual recordkeeping, are becoming outdated and inefficient. The current canteen, library and transportation subscription systems, which employ physical ID cards for payment, are tedious and error-prone, resulting in inefficiencies in college operations. In response to these difficulties, institutions across the world have been exploring new ways to improve their systems. One noticeable trend is the wide adoption of digital ID cards and student information systems (SIS), which make use of mobile technology to speed administrative responsibilities, improve accessibility, and promote digital transactions. These systems not only offer students with digital credentials saved on their cellphones, but they also centralize student data and automate procedures, enhancing campus efficiency and security overall. The addition of digital transaction capabilities enhances the

usefulness of these systems by allowing students to securely pay for campus services such as canteen purchases, library fines and transport subscriptions directly from their mobile devices. This shift to digital transactions reduces reliance on actual currency and 2 manual payment processes, giving students a more convenient experience while increasing the institution's financial accountability and transparency.

1.2 Objectives

The key objectives of our project are listed below:

- To provide digital credentials on mobile phones to enable access to campus facilities and services.
- To facilitate secure and hassle-free digital transactions for canteen purchases, library fines and transportation subscriptions via students' mobile phones.
- To implement effective authorization procedures to protect student data and mitigate the risks associated with physical ID cards

1.3 Motivation and Significance

The growing need to modernize college operations and improve student experiences encouraged us to select iCardSIS as our project. Traditional ID card systems can be inconvenient, with long queues and manual operations. Physical ID cards can be lost, misplaced or broken, which interferes with students' daily activities such as accessing canteen meals, borrowing books from libraries and using transportation subscriptions. iCardSIS seeks to overcome these concerns by offering a digital ID card system that also supports self-card recharging. This makes

transactions faster and easier, lowering wait times and administrative burdens. This effort seeks to use digital technology to address these inefficiencies and provide a smooth, secure, and convenient solution for both students and administrative professionals. iCardSIS also has a user-friendly interface that allows for easy navigation and utilize, making it accessible to all students, regardless of their technical skills.

Also, we worked on the same project on the last semester and the motivation that kept us working on the same topic is that there were flaws in our programs that could be vanished and the restructuring of the program with use of multiple different languages could provide us better outcomes.

1.4 Expected Outcomes

The implementation of iCardSIS is anticipated to yield several significant outcomes:

- **Increased Efficiency:**

Optimize college operations by automating administrative activities and centralizing student data, minimizing manual work and errors.

- **Greater Convenience:**

Offer students digital ID cards on their mobile phones so they can easily utilize services such as canteens, libraries, and transportation, as well as make digital payments.

- **Enhanced Security:**

Provide strong authentication to improve the security of student data and transactions while reducing the risks associated with physical ID cards.

Chapter 2: Related Works/Existing Works

Universities are providing students with digital identification cards as an easier alternative to traditional physical ID cards. One of the few applications based on the idea of our project is: The digital student ID card of Magdeburg-Stendal University of Applied Sciences.



Source: <https://uninow.com/news/blog/student-id-card-magdeburg-stendal>

Magdeburg Stendal University of Applied Sciences introduced the UniNow digital student ID in August. It is a smartphone app that has all the features of the previous paper student ID. Apart from providing a sense of identity in the classroom and in free time, children can also gain from a multitude of other uses. The ID card can also be used as a library card and is accepted by Erasmus+ as a European Student Identifier (ESI). The unique aspect of this situation is that two university locations accept the student ID card. A collaboration with the Magdeburg public transportation provider allows the digital student ID to double as a semester pass. The Stendal location's semester ticket is scheduled for release in the upcoming year.

Chapter 3:

1. System Design:

a. Student Registration:

For new users, the system shall start with the registration process by linking the students' ID card to their mobile number from the students' database then the system shall generate an id and ask the student to create a password for secure login and verification.

b. Login Page:

The same ID and password shall be used to log in next time. The student shall be able to log in on only one device at a time.

c. User Interface:

This shall have a student information page which shall be further divided into static and dynamic information. The static information page shall be the digital ID of the student that includes the university name, logo, students' photo, name, roll number, phone number, e-mail ID, stream, date of birth, blood group and validity of the ID card. The dynamic information shall be accessed through the menu button.

2. Menu Options:

a. Library Logs:

This shall allow the students to view the name and number of the books borrowed by them along with the due dates. For this the system shall connect with the library database.

b. Balance enquiry:

This shall display the: show balance, transfer balance and add balance options.

The show balance option shall show the current balance on the ID card, the transfer balance option shall allow students to transfer money to their friend's ID card. Lastly, the add balance option shall allow students to add money via digital transfers to their ID cards. It shall be used for two purposes: transportation subscription and card recharge. To sum up, this balance and enquiry option shall manage the virtual money linked to the students ID card.

c. Transportation status:

This shall include the photo of the student with active or inactive status based on whether the student has subscribed to the transportation facility. If the student is an active user of the transportation facility it shall display the bus route and due date of the payment.

d. Activity log:

This shall monitor and record all the activities performed by the user within the application.

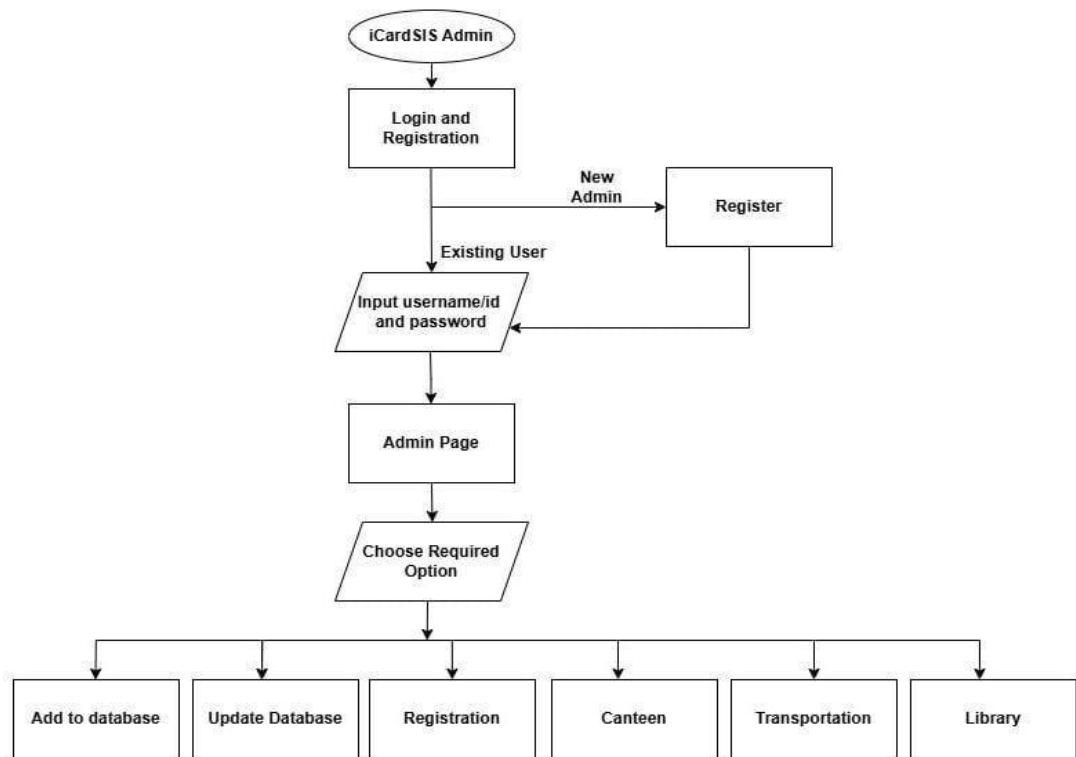


Figure 1: Workflow of iCardSIS-Admin

For Student

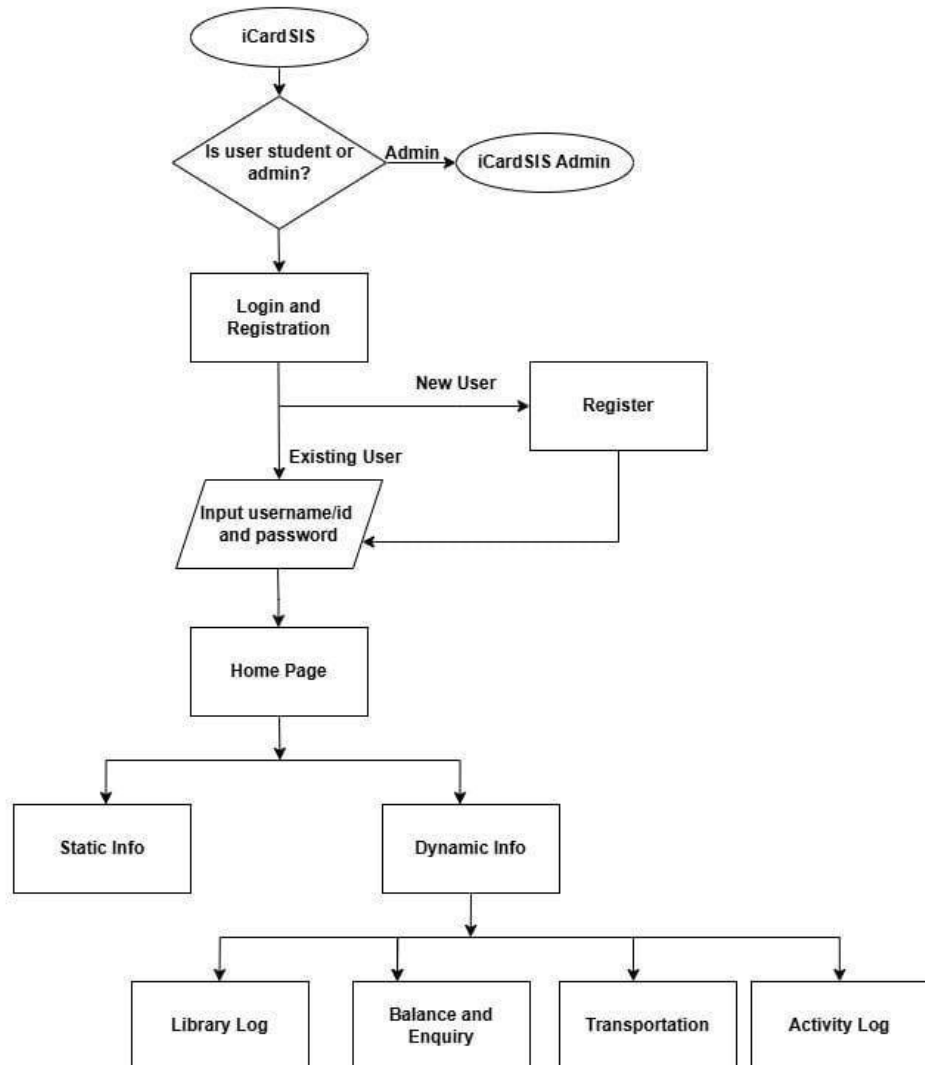


Figure 2: Workflow of iCardSIS-Student

Chapter 4: System Requirement Specifications

4.1 Software Specifications

4.1.1 Front End Tools

Flutter

Java Script

HTML

CSS

4.1.2 Back End Tools

Python

PHP

MySQL

4.2 Hardware Specifications

Devices to store and input data.

Chapter 5: Project Planning and Scheduling

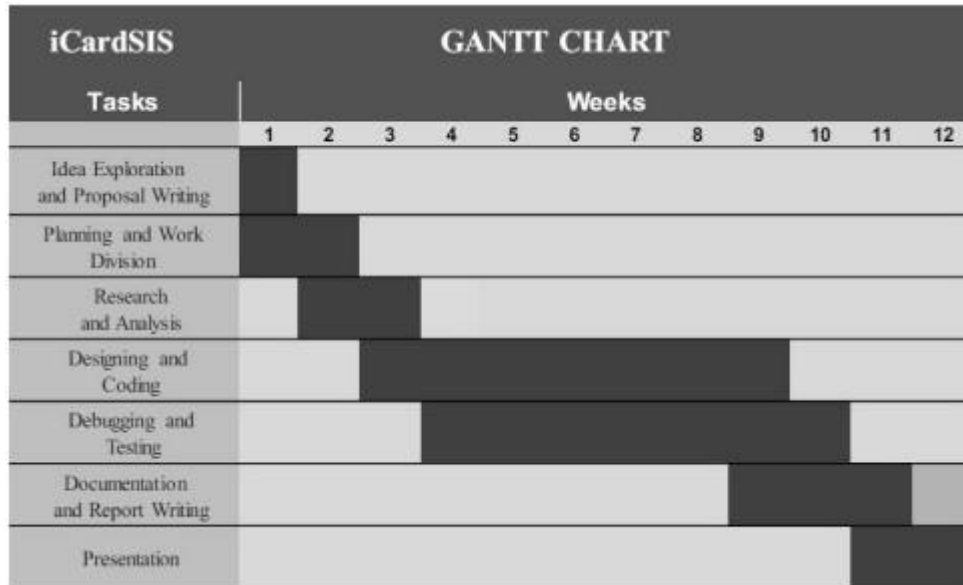


Figure 3: GANTT Chart

5.1 Tasks:

1. Idea Exploration and Proposal Writing
2. Planning and Work Division
3. Research Analysis
4. Designing and Coding
5. Debugging and Testing
6. Documentation and Report Writing
7. Presentation

Appendix

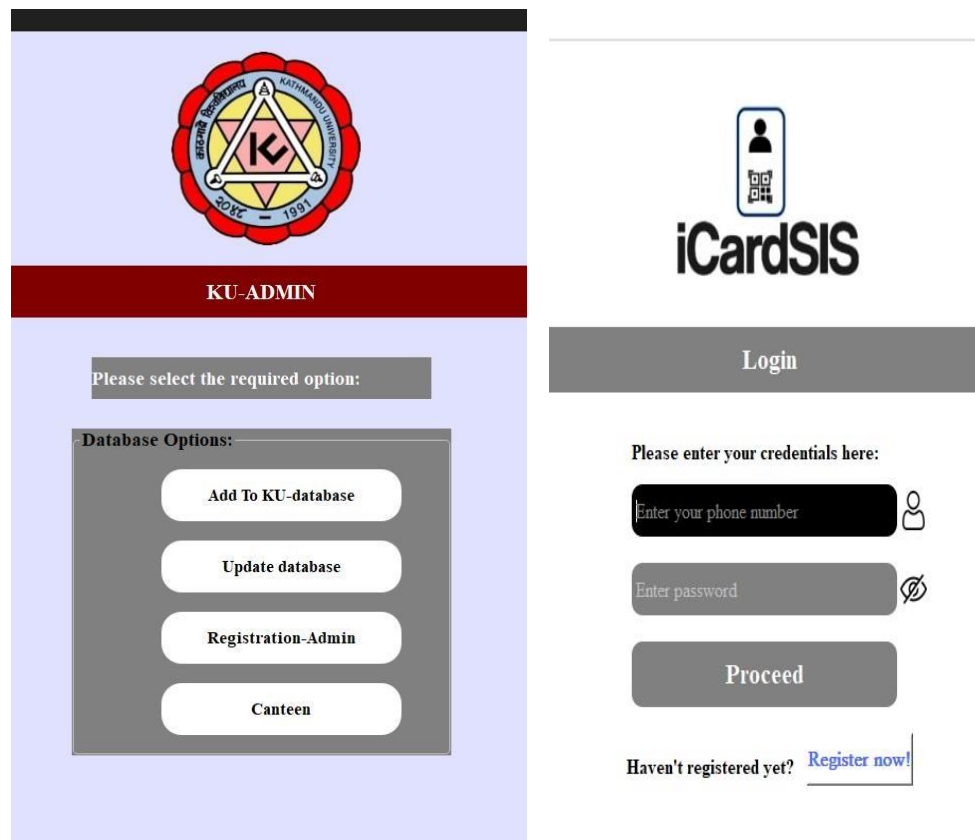


Figure 4: Previously developed iCardSIS

Figures of previously developed application of “iCardSIS” using C/C++ and Qt Framework. We have high hopes of redesigning the application with use of modern application development languages and achieving every goals that were limited previously.

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