

Student Transit Portal: A Web–Based Platform for Managing Seasonal Native-Place Travel for Hostel Residents

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Received : 08 May 2026; Accepted : 28 Jul 2026; Published : 08 Aug 2026.

Abstract. In many educational institutions such as colleges, they are hiring the government vehicles during the weekends for the hostellers to travel to their native places. Before journey, hostellers need to register their details manually. Students fill their details in forms which may lead to wrong entry and make offline payments. This may lead to data entry errors such as students' details mismatch which may take more time for both students and staff to complete the task. To overcome these problems a dedicated web application has been developed to automate the registration and allocation process. The web application consists of two modules - students and administrator. The newly joined students can use their hostel admission number for signup and after that they can book their bus pass through their login credentials. In the administrator login, the students' details and the travelling details can be managed. Admin can allocate the buses according to the places where the students need to travel. The backend is developed using python language whereas, for the frontend HTML and CSS is used with the database MySQL. This makes the people easy and pleasant to use. Updates carried out in the admin login will be reflected in the student's login also. If there is any issue in the bus pass it can be easily rectified by the admin and also students can easy to track their data. Future enhancements for this platform include the integration of secure digital payment gateways and live GPS tracking to ensure a cashless, transparent, and safe journey for all residents.

Keywords: *admin portal, student login, payment, hostellers, vacations.*

1. INTRODUCTION

Most of the educational institutions provide transport by hiring the government vehicles for hostellers during vacations. Students fill the details regarding their destination in register maintained in the hostel. The entered details are verified by the transportation in-charge. The existing manual processes may lead to data entry errors regarding the payment details and mismatch in student records because of lack of clarity in hand writing. The transportation in-charge has to sort down these errors manually which in turn increases his working time. In order to overcome these issues an automated web-based hostel transport management system is proposed in this work. The proposed work automates the registration and allocation of travel passes to tackle these issues and improve accuracy and operational efficiency [1], [2].



The proposed system consists of two modules - Student and Admin. The Student Module allows residents to register using their hostel admission numbers and to book travel passes securely through an authenticated portal, considering usability and security aspects in prior hostel management systems [3], [4]. The Admin Module provides the facility to the staff to manage the student database, restore deleted records in case of accidental deletion, allocate buses and generate name list on a trip-wise basis. These administrative features are based on methods used in automated hostel systems and complaint/record tracking [5].

The Combination of Python and MySQL help to keep data safe and manage records without data loss and wrong data entry. On the other hand, HTML and CSS gives more attractive and make easier for users to navigate. Some of the concept which was implemented are referred from the previous papers [6], [7], [8]. Allocating the bus number from the admin side, which automatically shows up in the student portal. This step cuts down waiting time and makes communication smoother. It overcomes the issues in handwritten and physical payment method and reduces the processing time. Secure payments online or even GPS tracking in real time would make trips cashless and more transparent, safer too [9], [10]. The author proposed the framework for managing the internal records, accommodation for the students, room allocation and internal grievances. They use HTML, CSS, JavaScript and reactjs for frontend and for the backend MSSQL is used in [11], [12]. In [5], [13], the authors explained how the data has been collected from the user. The author uses password hashing and role Based Authentication for security purpose. The authors described about managing the students' behavior in the dormitory [14].

2. METHODOLOGY

2.1 Software Used

To automate the problems, the hardware and software components for designing the website platform such as HTML, CSS, JavaScript are used. In python, FLASK package was used to connect the webpage and the SQL Database. The MYSQL database was used for storing and retrieving the hostel student's information and the admin can take the reports. One TB is sufficient for storing this information.

2.2 Work Flow

The Web-Based Platform for Managing Seasonal Native-Place Travel for Hostel Residents workflow is shown in the Fig. 1.

2.2.1 Student Module

Student Module is intended as an advanced, responsive system through which residents can arrange their travel plans without external help. By replacing the old system of signing up manually by writing in a form, the booking system takes advantage of the students' admission code and serves as the main way of ensuring his/her identity in the system. To increase the quality of data entry, the module offers pre-designed drop-down menus for entering destination and date of travel, eliminating the issues with spelling errors in handwritten forms. The central function offered to users in this module is the booking dashboard, according to which one can follow the progress of one's application starting from the point of "Pending" until "Allocated."

2.2.2 Admin Module

The Admin Module acts as the control center that offers powerful functionalities for handling huge amounts of travel information with very little human intervention. This module uses Python/Flask server, with all t CRUD operations required for managing the student database. In order to prevent any form of unintentional data loss during peak vacation seasons, we incorporated the functionality of soft-delete into the Admin

Module so that any data that gets deleted will be saved and stored within the MySQL database for future use. The main feature offered by this module is the intelligent bus allocation system, through which the admin can search the entire database for particular destinations and allocate buses to individual groups of students. Moreover, this module generates automatically a trip-wise manifest, eliminating the need for manual logging and making sure that there is synchronization between the bus coordinators' passenger list and the students.

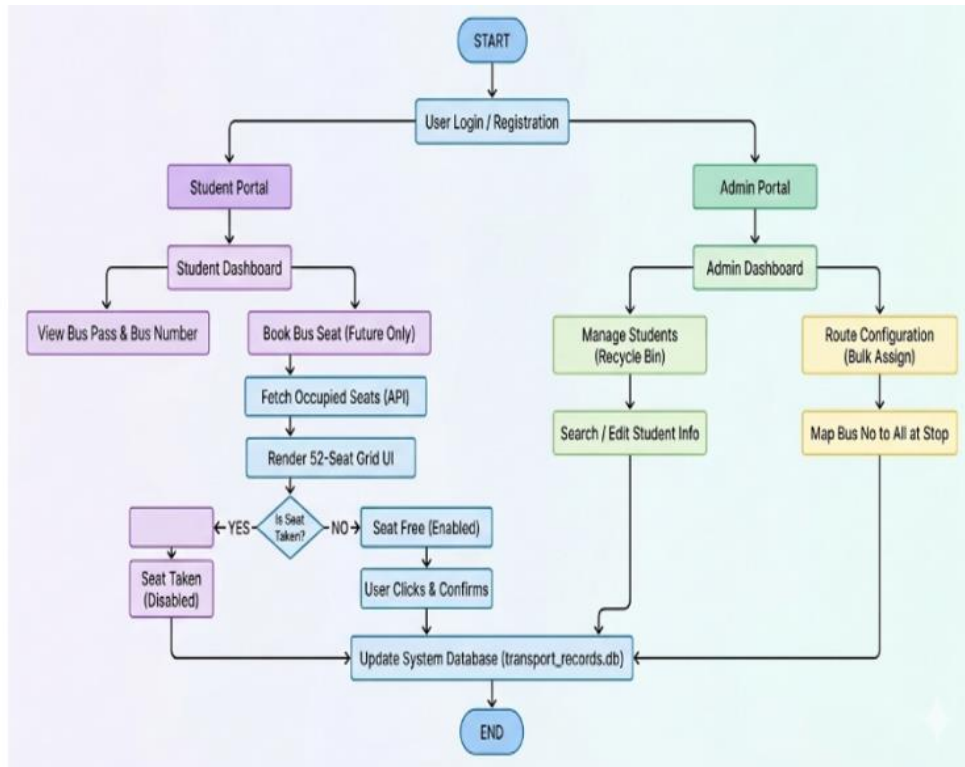


Fig. 1. System Architecture

2.2.3 Database Schema

The schema designed for this Student Transit Portal is shown in the following figure Fig 2.

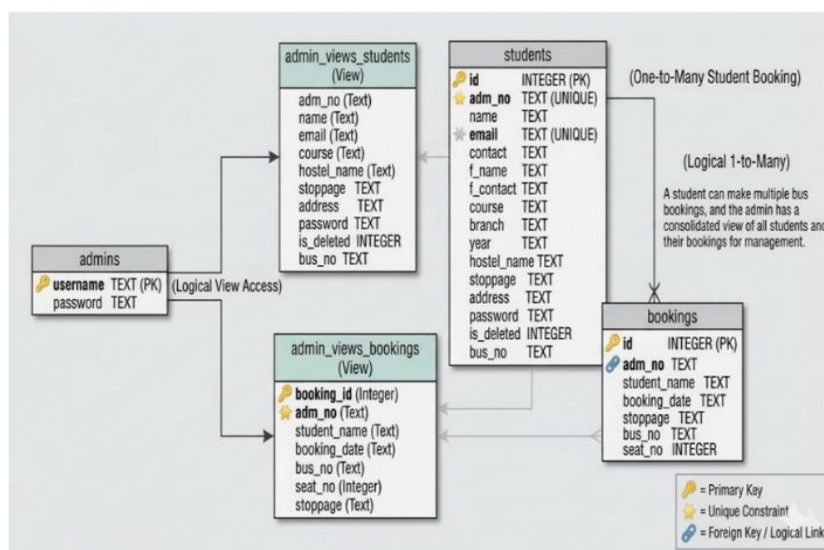


Fig. 2. Student Transit Portal Schema

3. RESULTS

The drop-down menu determines whether the user is admin or the student. Based on the selection, the validation is being carried out. In order to guarantee data integrity, we applied some rigorous steps of multi-level verification, including access control management for both sides - users as well as admins. In our case, existing users can access the Student / Admin Portals directly using their registered login details while new hostel residents will need to perform their self-registration process first before they are able to proceed with seat allocation. When a student starts filling out his/her own details for self-registration, several automatic validations take place behind-the-scenes based on predefined campus-specific rules. As seen in the Fig 3 the user is in the state of student.

The validation of the students based on the hostel admin number during the process of registration can be seen in the Fig. 4. The new hostel user need to register for the first time. First, the application validates that he/she has used only a valid admission number (ending in either GH, YH, SH, MH, or TH). These specific letters indicate which residential block within the university premises corresponds to each individual's stay – such as GH representing Ganga Hostel etc.). Also, importantly, the associated hostel name must match what was entered in the drop-down box presented earlier. If admission number does not possess this exact combination, then chances are pretty high odds-wise against them being considered eligible participants. There occur few instances where individuals mistakenly include other characters besides those mentioned above resulting in rejection notifications like 'Invalid Credential'. Once registration is completed the based on the hostel admin and password they can able to book the bus pass.

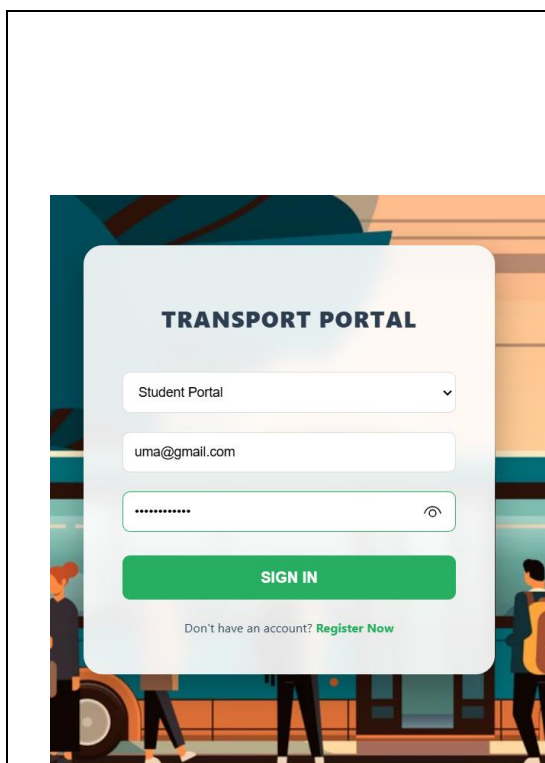


Fig. 3. Students Login Page

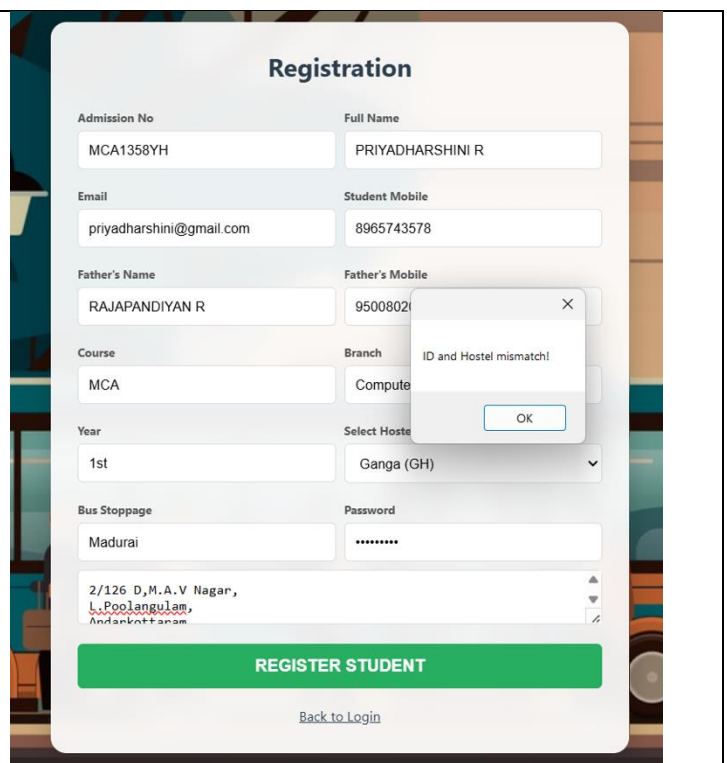


Fig. 4. Invalid Message for Hostel and Id Mismatch

Students can book their bus pass by “Book Bus” menu from the left of the page as shown in the Fig .5. From the book bus menu the date of journey need to be picked and preferred seats can chosen by the students. If the seat was already booked it shows the error message.

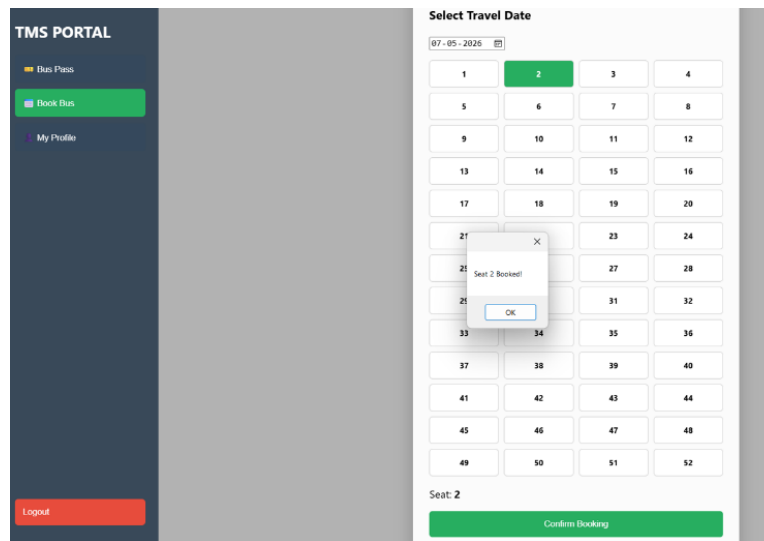


Fig. 5. Booking the Bus in the Portal based on Seats

When the booking is completed, the process is carried out by admin in the admin portal for allocation of bus. After the allocation of bus by the admin, the bus number will be displayed in the student login with the bus number as shown in Fig. 6.

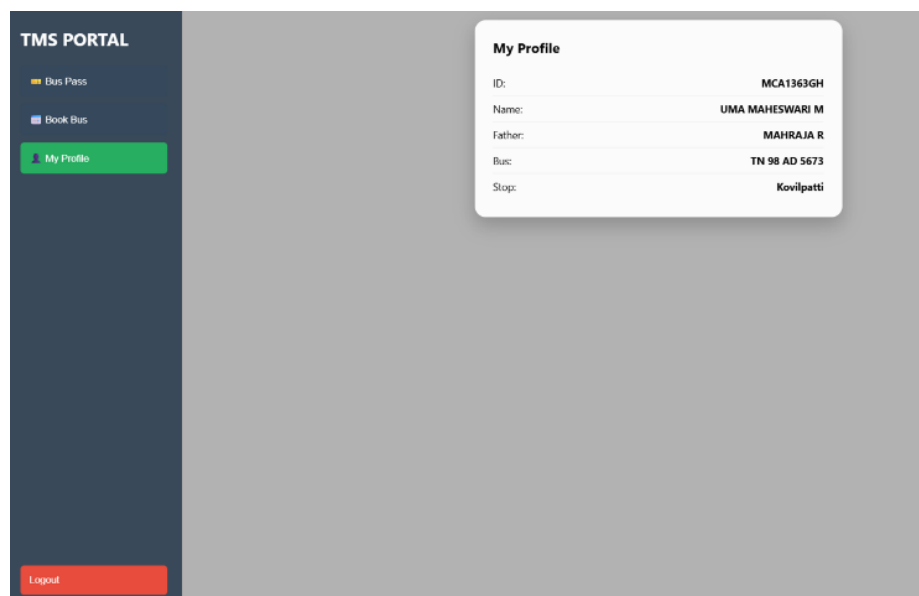


Fig. 6. Bus Pass in the Students Portal

In the control center, administrative Staff have CRUD access to add/edit/modify/remove student profiles to address potential input errors. They will be able to perform mass routings by searching their database for desired destination stops, then instantly mapping assigned government bus numbers to each registered resident on that route. To prevent accidental human error from corrupting manifests during busy vacation seasons, the admin module features a “soft-delete” architecture in which the system simply archives the user’s details in a dedicated ‘Recycle Bin’ log rather than permanently erasing its history when delete is clicked on any given profile. The admins can still be view the archived data and if needed at any point, users may easily restore these records back into the live transport database with no data loss whatsoever. In the admin portal, admin can view the number of students who have registered in the portal and admin can edit the students details which was mistakenly entered. The entire dashboard for admin portal is shown in Fig.7.

Admin Portal Logout

Students Logs Recycle Bin

Bulk Route: Apply

Adm No	Name	Stop	Bus	Actions
MCA1363GH	UMA MAHESWARI M	Kovilpatti	TN 98 AD 5673	Edit Del
MCA1365GH	RAMYA S	Tirunelveli	NOT ASSIGNED	Edit Del

Fig. 7. Admin Portal

By searching the city/town in the route and adding the bus number to the menu which can able to allocate the students for their native places and the bus number will be allocated to each and every students as shown in the Fig. 8.

Admin Portal Logout

Students Logs Recycle Bin

Bulk Route: Apply

Adm No	Name	Stop	Bus	Actions
MCA1363GH	UMA MAHESWARI M	Kovilpatti	TN 98 AD 5673	Edit Del
MCA1365GH	RAMYA S	Tirunelveli	TN 78 RD 3478	Edit Del

Fig. 8. Bus Number Assigned Successfully the Portal

4. DISCUSSION

Student Transit Portal is a new way of performing the work that used to be done in an old-fashioned laborious manner. The main idea is to avoid any delay in filling out the documents, data duplication,

inaccuracies and managing the cash payment. As of now, all the information stored in the system can be found with a single click due to the use of a centralized MySQL database. One of the major improvements in terms of the new system is its transparency. When students used to receive all the bus allocation details right before departure, it becomes possible to track every process immediately after allocating a bus number by the administrator. At the same time, the task of making a "trip-wise name list" becomes fully automated. Yet, in the early stages of designing the application, the following problem was observed -even though the process of digital registration is smooth, the requirement to have "payment" on hand remains a slight logistical problem. The current system is able to regulate all the informational flows effectively, the flow of finances requires physical presence of people. Moreover, the inability to track real-time transit remains another drawback of the system. All these aspects become the main motivation for introducing some improvements in the future, including API-powered payment gateways and GPS modules.

5. CONCLUSION

The "Student Transport Portal" has been successfully implemented as a solution to the logistical problems of universities related to organizing seasonal transportation of their hostels. Through the employment of the Flask software and the SQL database, the web application has become the perfect solution which can be easily adjusted for different purposes and institutions. During the registration process the details of the students are entered and stored in the database. The required data for booking the bus are retrieved from the database automatically and reduces the data entry error and processing time. With the simple web application, the problems have been resolved in effective manner. In future enhancement, live GPS tracking system is to be incorporated with the help of the Scanners and GPS devices. With the help of the payment gateway API, the online payment shall be made by the students. Adding this feature in the portal, not only make the process easier but also add a layer of security and peace of mind for both students and their guardians during their journey time.

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