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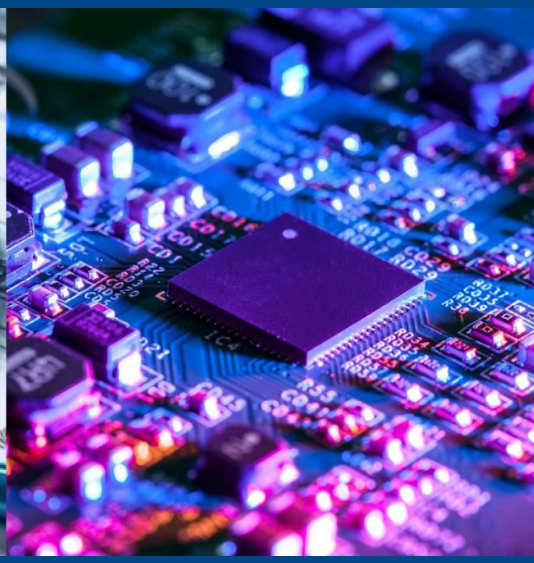

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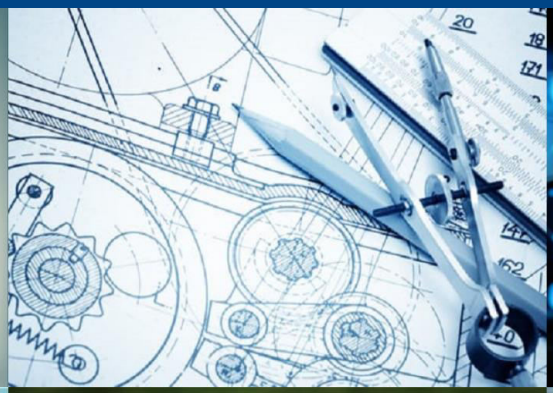

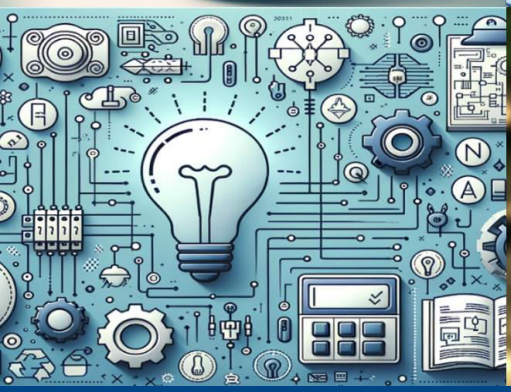

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Design and Development of an Online Bus Pass Management System for College Students

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ABSTRACT: The Online Bus Pass Application System is a web-based platform designed to simplify the process of applying for and managing college bus passes. It allows students to register, select routes, upload necessary documents, and make payments online. Administrators can review and approve applications, issue digital bus passes, and track student data through a user-friendly interface. This system aims to reduce manual work, improve efficiency, and provide a seamless, transparent process for both students and college staff.

KEYWORDS: Online Application, Automated Verifications, Digital Bus Pass, Time-Saving.

I. INTRODUCTION

Students from 1st Standard to 12th Standard studying in government-recognized schools, as well as students enrolled in Government ITIs, Government Arts and Science Colleges, and Government Polytechnics, are eligible to avail the Free Bus Pass facility. These passes are issued for travel between the student's residence and their respective educational institution. The pass allows travel on all days of the month and is valid on Ordinary, Express, and Deluxe services, excluding Night Services and AC buses.

The procedure for obtaining the pass involves school authorities collecting the necessary application forms from the Head Office of the Metropolitan Transport Corporation (MTC). MTC's designated agency visits the schools to take student photographs and issue the bus passes through an online system. After lamination, the passes are distributed to students directly at their schools.The free passes are issued from the 15th of June to the 30th of November each year, and they remain valid from 15th June to 30th April of the following year.

II. SYSTEM MODEL AND ASSUMPTION

The proposed **Bus Pass Management System** is a web-based application developed to automate and simplify the process of managing student transportation within a college environment. It is built using Python with Flask for the backend, MySQL for the database, and Bootstrap for the frontend, all deployed locally using WAMP Server during development. The system is designed with a multi-role structure consisting of College Admin, Students, and Bus Operators. Each role has dedicated access to specific modules based on their responsibilities. The platform allows students to apply for or renew bus passes, make online payments, and receive e-passes instantly. At the same time, the College Admin oversees the entire transportation system — managing routes, buses, operators, applications, and generating analytical reports. Bus Operators can view assigned buses, validate passes, and track student travel.

The system assumes that all users — students, admins, and operators — have access to internet-enabled devices such as smartphones or computers with modern web browsers. It is also assumed that College Admins are responsible for creating and managing valid user accounts, ensuring that each student has only one active bus pass at any given time. All routes and fare tariffs are pre-configured by the admin, and students must select their preferred route while applying. The system depends on secure payment gateway integration to facilitate hassle-free fee transactions. Notifications regarding application status, renewal reminders, and pass expiry alerts are sent via email or WhatsApp, assuming users have these services enabled. Additionally, all actions such as pass approval, generation, or renewal are subject to admin verification to ensure proper authorization. It is also expected that the system may undergo periodic maintenance during non-peak hours, with prior notice given to users. Overall, the model promotes centralized

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management, role-based access, and a paperless workflow, ensuring transparency and efficiency across the entire transport management process.

III. PROPOSED METHODOLOGY

The proposed system introduces an intelligent online Bus Pass Management platform that streamlines and automates student transportation processes using modern web technologies. Admins can easily manage student applications, routes, buses, and operators through a clean and user-friendly dashboard. The platform allows real-time updates, application tracking, and sends automated notifications via email or WhatsApp to inform students about their pass status, expiry, or renewal reminders.

Smart automation ensures that the system functions smoothly with minimal manual intervention. The system uses rule-based logic to verify eligibility, track renewal timelines, and assign students to buses based on selected routes. This digital transformation reduces paperwork, eliminates human errors, and improves efficiency. By offering features like digital pass download, secure login, and real-time reports, the system provides a personalized and reliable transport experience for both students and college authorities.

IV. SCOPE OF THE PROJECT

The scope of the Bus Pass Management System defines the functional boundaries and objectives of the software, detailing what features are included in the system and how they support the college's transportation management. This system is developed to digitalize and simplify the entire bus pass process—from application to pass generation and renewal—ensuring a smooth experience for students, administrators, and bus operators.

Bus Pass Application and Management: The system allows students to apply for new bus passes, renew existing ones, and upload necessary documents. Students can choose preferred routes, view bus details, and track the status of their application in real-time.

User Management: Multiple user roles are supported, including College Admin, Bus Operators, and Students. Each user has role-based access to modules and features tailored to their responsibilities within the system.

Route and Bus Management: Admins can create, update, and assign routes and buses. The system supports mapping students to specific routes based on selection and capacity constraints, improving route planning and efficiency.

Application Review and Approval: Admins can review applications, approve or reject them, and monitor the list of active and expired passes. The system enforces validation checks to ensure only eligible students receive passes.

Digital Pass Generation: Once approved, a digital e-pass is generated containing student details, route, and validity. Students can download or share the pass directly from the portal.

Notification System: The platform includes a notification module to send alerts regarding application status, pass expiry, renewal reminders, and system updates. Notifications are sent via email or WhatsApp, and students can manage their preferences.

Participation and Feedback: Students can submit queries or feedback regarding bus services, and admins can respond, creating a two-way communication channel for service improvement.

Admin Dashboard and Reporting Tools: The College Admin is provided with a powerful dashboard to manage all users, monitor system performance, track renewals, and generate reports. These reports include data on application counts, payments, route usage, and pass expiration analytics.

V. RESULT AND DISCUSSION

The Bus Pass Management System effectively streamlines the student transportation process by enabling online applications, digital pass generation, and automated approvals. It reduces manual workload for the admin and offers a

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smooth experience for students. Real-time notifications keep users informed about application status, expiry, and renewals. The use of clustering algorithms like OPTICS helps optimize bus route planning based on student location data. Overall, the system enhances transparency, saves time, and ensures efficient resource utilization. It provides a scalable solution that can be adapted by other institutions for better transport management.

Figure1. Home Page.

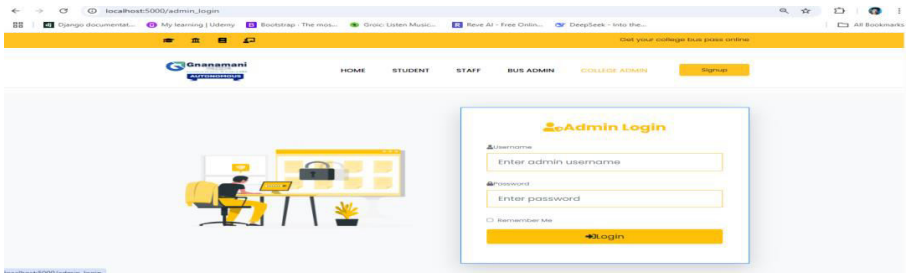

Figure2. College Admin Login Page

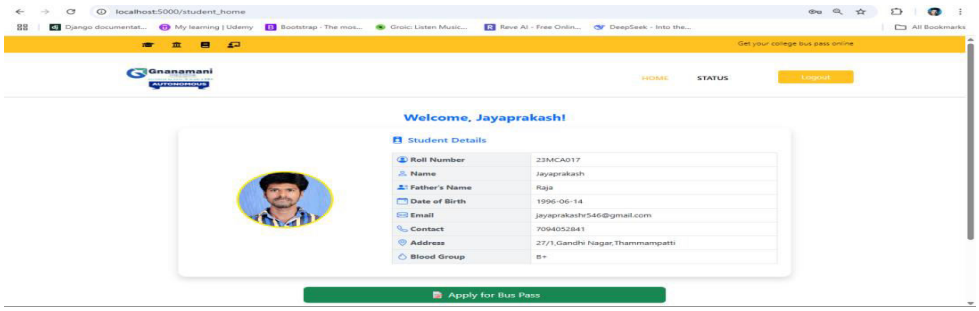

Figure3. Student Dashboard

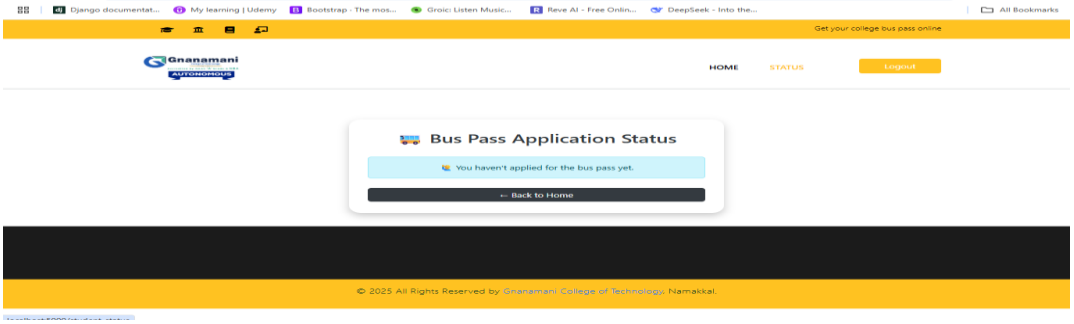

Figure4. Bus Pass Status Check.

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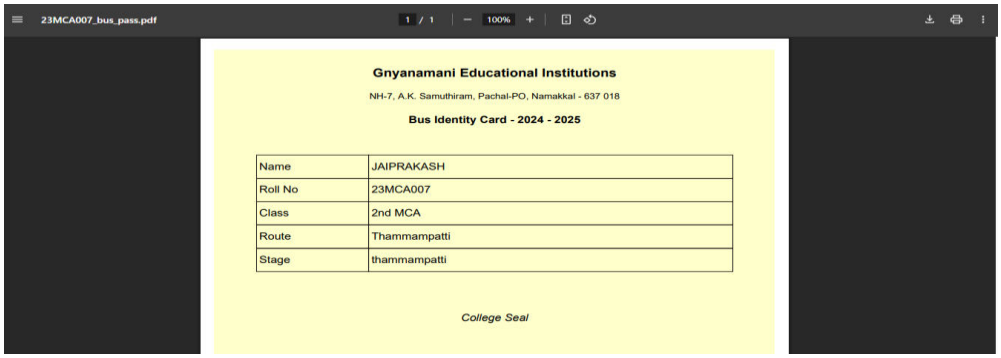

Figure5. Bus Pass Download.

VI. CONCLUSION

In conclusion, this project provides an effective and digital solution for managing college bus pass applications. It replaces the manual, time-consuming process with an automated system that enhances accessibility, accuracy, and operational efficiency. By integrating user-friendly interfaces for students, administrators, and bus operators, the system ensures smooth communication and real-time updates. Features like e-pass generation, expiry alerts, and renewal options contribute to a hassle-free experience, making the overall transportation management more streamlined and reliable for educational institutions.

REFERENCES

1. M. Furkhan and H. R. Divakar, “Smart Bus Pass System Using Android ”, IJRESM, vol. 5, no. 7, pp. 71–74, Jul. 2022.
2. S. Famitha, G, “Online Bus pass Generation System using Web Application “2019.
3. Prof. N. V. Chaudhari, Komal Malewar, Komal Sukhadeve, Jayashri Uke. Arti Panpate, “Android Application for Issuing Bus Pass ” Dr. Babasaheb Ambedkar College of Engineering and Research Nagpur, India, 2020.
4. Patel, Bhumik, and Parthvi Pandey. “RFID Based Bus Ticketing system.”, International journal of scientific research and engineering trends. Volume 4 issue 2, mar-apr (2018).
5. Hu, N., Wei, G., Jihui, M., Design and Implementation of Bus Monitoring System Based on GPS for Beijing Olympics International Journal of Engineering Trends, Vol 7, No 4, pp. 540–544, 2017.
6. Sridevi. K 1, Jeevitha. A 2, Kavitha. K 3, Narmadha. K, Sathya. K., Smart Bus Tracking and Management System using IOT, International journal of advanced engineering technology, vol 5, pp. 453–458, 2017.
7. Android Application for Issuing Bus Pass Prof. N. V. Chaudhari1, Komal Malewar2, Komal Sukhadeve3, Jayashri Uke4, Arti Panpate5 Dr. Babasaheb Ambedkar College of Engineering and Research Nagpur, India.
8. INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH TECHNOLOGY DIGITAL BUS PASS FOR LOCAL BUSES Snehal Banale*, Prajakta Dudhade, Rajshree Pal, Sayali Patil Department of Computer Engineering, APCOER, India12345 Prof. Sneha Jagtap, Department of Computer Engineering, APCOER, India5.
9. Nilesh, A. Dhokrat, et al. “Qr code based student bus pass system.” Matoshri College of Engineering and Research Center (2019).
10. Shelke, Jivan, et al. “Bus Pass Mobile Application Using QR Code.” (2018).

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