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An Android-based Smart Bus Pass application

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Abstract: The current manual process of registering and renewing bus passes is problematic for passengers, but a real-time effort called PTC Registration and Renewal will help. In addition to extending the validity duration, it sends passengers regular SMS warnings before their validity period expires. Payment for registration or renewal can be made online using a credit card. Members of the administrative team can also log in to the app and use it to communicate with passengers in a certain way. Rather than waiting in line at counters for hours, riders may simply renew their bus cards online using this convenient application. At the outset, travellers need to sign up for the app by providing their name, address, phone number, and any other necessary information. Passengers are required to enter a mobile number and passcode in order to log in after their details have been verified. The next step is for riders to choose their route and purchase their bus ticket. Credit cards and other wire transfer options are also available for renewal. Traveling passengers can pay via a QR code that is displayed next to the bus driver. The smartphone app is the sole means of implementing this system.

Keywords: *: Smart Bus Pass Application, Android, QR code, Safe Services For Passengers, Banking Application*

Introduction

Our idea was developed with the intention of offering travellers services that are safe, comfortable, and efficient. The current system has its flaws, so we came up with the idea of making the bus pass online so that passengers may have greater assistance [6]. While the previous method required students to manually complete each step, our project streamlines the process for passengers, making their work easier and faster. Using the smartphone app, students can enroll for the bus pass online [7-13]. Passengers can also save time by using this approach. Students can use a banking app to pay for bus passes [14]. Passengers are not obligated to perform any task upon visiting the desk.

Objective

- The method for registering and renewing bus passes online was developed by us.
- You can renew your bus pass online with our app without having to register again.
- Bus passes are available for purchase online on a monthly, annual, and half-yearly basis.

Scope of the Project

Since technology is advancing at a rapid pace, it is imperative that we adapt to keep up [15]. Buying a bus ticket is a laborious and time-consuming ordeal as it is. Our idea was developed with the intention of offering travellers services that are safe, comfortable, and efficient [16-22]. As a result of problems with the previous system, we developed the online bus pass system, which is convenient for riders and makes their lives easier. No more waiting in long lines for people to register and pay; everything can be done online [23-27].

Motivation for Doing This Project

Paperless environments will be created through the usage of QR codes, which will help save forests. It saves time because less space is needed to save the record [28-32]. Participants can use their mobile devices to participate, eliminating the need to lug about large amounts of cash or other smartcards.

Literature Survey

The purpose of this project is to provide a database system that effectively manages bus pass information. There are two logins in the system: one for the user and one for the admin. A web programme that enables individuals to obtain online bus passes is known as the online bus pass generation system. The initial goal of this system was to create an app that could access basic authentication data and issue bus passes to specific users without making them wait in line. It would be nice to have an online system that can generate bus passes; this would cut down on paperwork and make receiving bus passes easier. At any time before a pass expires, the user has the option to top off their account and prolong its validity. Through login, the administrator has access to all user details and balances. People in any part of Karnataka can use the system to obtain bus passes; additionally, there is no need to renew the pass [1].

Students who are having trouble with the existing manual process of registering for and renewing their bus passes can benefit from online bus pass generation. Online registration is required of the students. The student's email will be notified of an OTP code once registration is complete. After reviewing the student's information, the administrator will either approve or reject the bus permit. The student's mail will be the recipient of the produced pass. After entering their college ID and password, students can renew their accounts online. Various details regarding the buses, qualifying requirements, prices, and schedules are offered. We will receive information on the bus schedule, fare, and pass reservation system. An online application form did not exist in the past. Manual execution of the process is required. So, it takes additional time [2].

The goal of this project is to explore and construct a web portal for an online bus ticketing system that both customers and bus operators can use to buy and sell bus tickets online and helps bus operators run their business more efficiently. The fast growth of e-commerce has changed the way people buy bus tickets, which used to be done at the counters in bus terminals. So, this research investigates the reasons behind the evolution of current e-ticketing systems and critically assesses them before building the system. Customers and bus operators alike will find solutions to common issues with this project, including, but not limited to, unhealthy working conditions, lengthy ticket purchasing lines, and unlawful bus operators. The study examines several implementation concerns and provides recommendations for the successful deployment of the web portal for the Online Bus Ticketing System. This study suggests a star rating system that takes into account monthly sales, popularity of bus operators, and traffic offences as measured by the law. In order to fulfil the needs of the client, this study also suggests a decision support system that gives the client trustworthy options from which to choose. One aspect of this research is the creation of a model for purchasing bus tickets online. A web platform that will help achieve the research goal. This online hub will facilitate the growth and maintenance of an integrated system that connects bus companies with one another, with consumers, with other transportation providers, with businesses, and with government entities [3].

The purpose of this project is to provide a database system that effectively manages bus pass information. There are two logins in the system: one for the user and one for the admin. In order to save time and avoid long lines, commuters could benefit from an online system that generates bus permits. The goal of this system is to facilitate tasks such as issuing bus passes to commuters without causing them to wait in long lines and accessing basic authentication information. It would be easy for the bus official to check the pass's legitimacy [4].

The primary objective of this programme is to provide a reliable online bus pass system. Additionally, it keeps track of traveller data in a database. There are two logins in this system: one for the user and one for the admin. The project offers systems for creating and renewing bus passes [33-35]. A bus permit can be obtained with this real-time software. It streamlines the procedure and saves time by reducing paperwork, which is a major plus. When a user's pass is about to expire, they have the option to renew it and add more time to its validity. The goal of this system is to create an app that can access authentication data and provide passes to certain users. Therefore, customers will not have to wait in line for too long. People can benefit from this system in order to receive a pass. Passes can be obtained at any time and at any location [36-41]. The inclusion of photos and unique IDs makes this project beneficial because it prevents pass reusing. A notification will be sent out prior to the end of each month. Everyone on board will be able to obtain a pass without delay because of this. Daily, monthly, and annual bus passes are the goals of this system [42-49].

System Analysis

A concise analysis task is to be created by the System Analysis, which also seeks to establish comprehensive information regarding the concept, behaviour, and other limitations, including performance metrics and optimization of the system. The goal of system analysis is to clear up any confusion by providing a detailed description of the technical aspects of the central idea [50-55].

Existing System

The proposed project is about fixing problems with the current manual renewal process for bus passes for riders of the general public transport service. Travelers are required to stand for a minimum of one hour in order to purchase their tickets.

Proposed System:

In this paper, we present an alternative approach to online generation of the Bus pass-through. Our system's mobile app provides the passenger with all the necessary details. After that, you can use your online banking to pay. A SMS alert or notification will be provided to the traveller in the event that the pass expires. The process of obtaining a bus pass becomes more easier and faster with less paperwork. Avoiding the bus station is possible because all the necessary information for the bus pass may be found online [56-61]. Passengers will be able to purchase bus passes online using this software system, doing away with the requirement to collect tickets for each travel or stand in line. Travelers have the convenience of making online payments and can utilise the QR code at any time.

System Study

Among the many goals of a System Requirements Definition is the creation of an analysis job specification that includes exhaustive details of the need, behaviour, and any other limitations, like functional performance, that may be in place. A software product's technical requirements should be defined in detail and without room for interpretation in the Software Requirement Specification.

System Implementation

Systems implementation specifies the requirements for the information system's construction, guarantees the system's usability and operating status, and checks that it satisfies quality standards. The principles, components, and parts that make up an architecture can be visually represented in an architecture diagram (Figure 1).

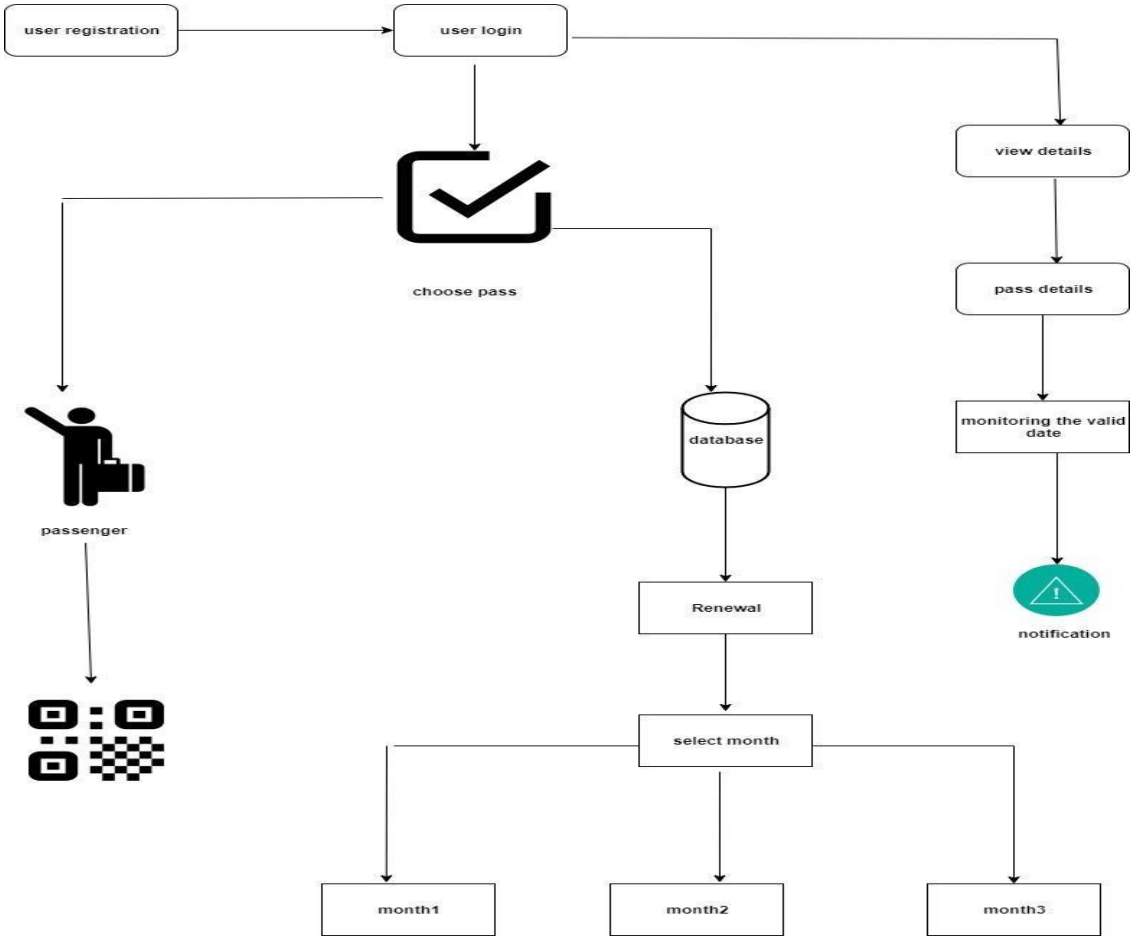

Figure 1: Architecture Diagram Module

Separately titled and addressable parts of software, known as modules, are combined to meet the needs of a problem. The ability to make software more easily manageable on an intellectual level is known as modularity.

Module 6: Notification alert

It gives you a popup notification after the pass validation period is over.

System Testing

There is a certain amount of structure and predictability to the testing process. Consequently, it is important to establish a software testing template for the software development life cycle. This template should consist of a series of processes that may be used to incorporate various test case design approaches and testing methodologies. Among software engineering tasks, testing typically takes the most time and energy. In a disorganised manner, it leads to squandered time, extra work, and worst of all, mistakes that go unnoticed. Consequently, it seems sense to create a methodical plan for software testing [62-71].

Unit testing's basic objective is to extract the smallest tested component of an application, separate it from the rest of the code, and check that it functions exactly as expected [72].

Before integrating them into modules, we test each unit independently to ensure that their interfaces are robust. Countless bugs have been found thanks to unit testing, proving its worth

[73-81] . Passwords and usernames with no length are required in both the company and seeker registration forms. The duplicate username has also been provided and verified.

Only once the client-side validations have been executed will the button transmit data to the server in the task and question entry. The dates were input and verified incorrectly. Both the email address and the URL (Universal Resource Locator) for the website are incorrect [82-89].

Each module undergoes testing as part of the integration process. Once each module has passed its own set of tests, they are combined to form the final system. This system is then tested using a set of carefully crafted test data to ensure its successful operation in every possible scenario [90].

System testing provides a chance to demonstrate the system's functionality to the user while simultaneously confirming that everything is in order.

The last phase is validation testing, which checks if the programme does what the user said it would. Instead of the system developer doing this test, the end user typically does it as part of a process known as "Alpha and Beta were testing" to detect bugs that only the end user can find [91-95]. If the final consumers are happy, then the project can be considered complete. Several methods of validation testing are employed throughout the project. Please note that the question entry form will only accept the right answer. Only the four options provided will be considered.

A number of approaches to software testing have been put out there in the academic literature. In common, they all serve as a testing framework for programmers and have the following traits:

In order to test the full computer-based system, testing starts with individual components and moves "outward" to integrate them.

At various stages, various testing procedures are more suitable. Both the software developer and, in the case of larger projects, an outside testing team are responsible for testing [96-98].

Contrast this with white-box testing, which is essentially the inverse of black-box testing. During testing, they pay no attention to the internal variables. You can see exactly what's happening when the system is running thanks to this. The locations where the issue manifests were identified and eliminated.

In black box testing, we manipulate the system's inputs to see how it responds. At this point in time, I will not be visiting the system's internal files to observe any modifications made to them in order to get the desired result.

To ensure that sub-modules can communicate with one another and integrate with the controller module in a recursive fashion, interface testing is conducted.

The term "module testing" refers to the practise of checking each individual module of a system. All of the inputs, as well as the outputs and their accuracy, are part of it. By putting this approach through its paces, we can identify any errors with pinpoint accuracy.

Feasibility Study

The optimal solution that satisfies performance requirements is chosen after a feasibility analysis. Finding out whether developing the product is technically and financially feasible is the primary goal of the feasibility study activity. In order to conduct a feasibility study, one must first analyse the problem and gather all pertinent product information, including the data items that would be input into the system, the processing that needs to be done on these data, the data that needs to be output by the system, and any constraints that the system may have on its behaviour.

Technical Feasibility: This part deals with the details of the software and hardware needed to meet the needs of the user. The system's technical requirements could range widely, however they could include The ability to generate outputs within a certain timeframe. Time required to respond in specific scenarios. Skill in swiftly handling a specific number of transactions. The ability to transmit data to other places. System configuration, rather than hardware manufacturer, is the primary metric used to evaluate technological feasibility. An accurate depiction of the system's needs should be provided by the configuration: In order for everything to run well and interact with one another, how many workstations are needed and how are they linked? Additionally, for what print quality levels are optimal input and output speeds to be reached.

The most common method for determining if a system is feasible from an economic perspective is to do an economic analysis. A cost-benefit analysis, or CBA, is a method for calculating the potential savings and advantages of a system proposal and comparing them to the associated expenses. It is decided to build and implement the system if the advantages are greater than the costs. If the suggested system is to be considered for approval, additional reasons or alternatives will need to be presented. All parts of the system life cycle benefit from this outgoing effort's enhanced accuracy.

A select team of individuals well-versed in information system methodologies and adept at system analysis and design procedures conduct this feasibility study. In order for proposed projects to be useful, they must be transformed into information systems that fulfil the operational needs of the organisation. If the system will function properly once built and put into place, then this test has succeeded. One methodical approach to building the structure of a software is integration testing.

Conclusion

Users who are frustrated with the current system for registering and renewing bus passes will find it helpful. Within our system, we were putting this into action in a manner that was entirely centred on the mobile application. In the event that the passenger travels at times, they are able to utilise the QR code to pay for the bus fare. Additionally, if the user wishes to add some new requirements, it is simple to do so. In this way, the passengers experience less time and effort as a result of this system. Additionally, the traveller will receive an immediate notification on the renewal of the pass, which will make it simpler for them to proceed with the renewal process. For the purpose of future upgrades, the model may be utilised as an application for a rapid bus pass.

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