

House Rental Application System

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Abstract –An e-rental application is a web and mobile-based solution that enables landlords and renters to manage and access rental properties or equipment. The application, accessible via web browsers and as a mobile application on Android, provides a convenient and efficient way for both parties to conduct rental transactions.

Its web application allows landlords to easily create and manage their listings, set prices, respond to inquiries, and automate tasks such as sending reminders for rent payments and handling lease renewals. Renters can browse through listings, submit applications online, make rent payments, request maintenance, and even renew their leases. Moreover, its mobile application for Android devices provides an added level of convenience for landlords and renters. Landlords can manage their properties on the go, and renters can search for properties, communicate with landlords, and make payments while moving. The mobile application also allows renters to take virtual tours of properties and view images and videos before deciding.

This e-rental application can increase the visibility of a landlord's properties by listing them online, reaching a wider audience of potential renters. Additionally, the application provides landlords with valuable analytics, such as information on which listings receive the most views or inquiries, which can help landlords make informed decisions on pricing, property upgrades, and marketing strategies. As well as improve the communication between landlords and renters by providing a platform for both parties to communicate. It also includes sending messages, sharing documents, and scheduling appointments. It also improves security for landlords and renters by providing a secure way to collect rent payments and manage tenant information. Renters can securely submit sensitive information, such as personal data and passwords, of the rental property.

I. INTRODUCTION

The rapid development of technology has greatly influenced how we go about our everyday lives and work. In recent years, e-rental applications have emerged as a popular and efficient solution for managing rental properties and equipment. These applications provide a convenient platform for landlords and renters to conduct transactions and communicate with each other. However, as technology advances, it is critical to investigate ways to develop and strengthen these e-rental applications. This research paper explores the potential benefits and challenges of adding new features, such as G.P.S. and in-app messaging, to existing e-rental applications. This research aims to examine how these

features can improve the overall user experience and enhance the functionality of e-rental applications.

The rental industry has always been a vital part of the economy, providing housing and equipment for individuals and businesses. However, the traditional rental process can take time and effort, involving much paperwork and face-to-face interactions. With the advent of e-rental applications, the rental process has become more streamlined and efficient. These applications provide a convenient platform for landlords and renters to conduct transactions and communicate with each other.

However, exploring ways to enhance and improve these e-rental applications is essential as technology evolves. One way to do this is by adding new features such as G.P.S. and in-app messaging. G.P.S. technology can provide location-based services, such as helping renters find properties in a specific area or providing landlords with information on the location of their rental properties. In-app messaging can improve communication between landlords and renters, making it easier for them to discuss rental details and schedule appointments.

Implementing these new features can bring several benefits to the e-rental application. For renters, adding G.P.S. technology can make finding properties in a specific area easier, while in-app messaging can improve communication with landlords. For landlords, G.P.S. technology can provide valuable insights into the location of their rental properties, while in-app messaging can streamline the communication process with renters.

However, the implementation of these new features also brings specific challenges. One major challenge is implementing these features, as it can be costly for developers to integrate them into existing e-rental applications. There is also a risk that these features may not be used or used effectively, resulting in a waste of resources.

II. LITERATURE REVIEW

The primary purpose of this research and development is to abridge the gap between the existing system and its capability to which extent it can be enhanced. Moreover, it has a broader scope, covering multiple aspects such as tenant search and selection, lease management, maintenance and repair, and communication and feedback.

In 2017 "Development of Online Based Smart House Renting Web Application", this paper by diptavoumick and

Prince, Khan presents the user-centric design approach in developing a web-based house rental application system which meets the requirements of both tenants and owners.

Since 2014 "nobroker.com" has dominated the house rental systems field, offering a platform to promote the assets for renting and selling and allowing tenants to find their desired shelter. As a result, nobroker.com is one of India's largest online real estate portals.

"House Rental Application System Based on Blockchain Technology" by QingshuiXue, ZongyangHou – This proposes a house rental system using blockchain technology to find the housing leasing alliance chain.

III. MODULES DESCRIPTION

There are several modules in this application which are:

- A. Sign in and sign up.
- B. Post ads
- C. Favourites
- D. Search Property
- E. Chat

A. Sign in and Sign up

This module allows the user to create an account if there is no one. Moreover, it helps in signing in if there exists an account. Furthermore, all the data will be in a non-relational or NoSQL database, a MongoDB. Even storing the data was entirely different where the actual data, such as password, was, encrypted and stored in the database. While retrieving the data, the password entered by the user will be encrypted with the same secret key used previously to store the data will be used here and will check whether both cypher texts match or not. Likewise, user authentication will happen.

Along with this, the user also has the option to sign in with google, which makes the Sign in and Signup process much more manageable. This reduces the burden of creating a new account by entering all the details, such as mail I.D., username, and phone number. By google sign-in functionality, google itself manages the user data. Here to achieve this feature, we used the firebase cloud fire store.

B. Post ad

This module is mainly for property owners interested in posting property details in that system. Like it enables posting ads regarding their property, even the data entered here will be stored in the MongoDB database. This posting ad module requires an owner to post all the necessary details, such as the type of property, the exact location, and the pictures related to that property. For instance, if an owner wants to post an ad regarding the car parking property. Firstly, the owner needs to be logged in to access the post-adoption. Then the owner must select the type of property as car parking and fill in all the details related to that, along with the pictures of that particular property and the pricing.

Generally, in other house rental systems, this is a tedious task. Nevertheless, we simplified the process, making things easier to access.

C. Favourites

This module is mainly for tenants who are looking forward to rentals. This gives the capability for users to be able to create their wish lists based on their choice. Moreover, all those favourites will be organized in one place, the favourites section.

D. Search Property

It is a module that helps the users/tenants find the desired property based on price, location, and surroundings. In this module, the user can filter the search results. Based on several things such as property type, property location, and price range that the user wants to afford. This makes the search much more straightforward. And it even has an option to search based on the location too.

E. Chat

A chat feature is available in our system, allowing us to contact the property owners. This even allows the Tenant to request more details and even provides the chance to ask for more photos of that property that particular owner posted, which needed to be added to the existing system.

IV. EXISTING SYSTEM

For the past 5-10 years, the House rental system kept improving, which turned from paper-based to digitalized. The existing system has various functions, such as mobile and web-based systems. Along with that, it provides good support too. It enhances the process of buying and selling properties such as Flats and houses, apartments, villas, and independent houses. Furthermore, it even provides personalized recommendations.

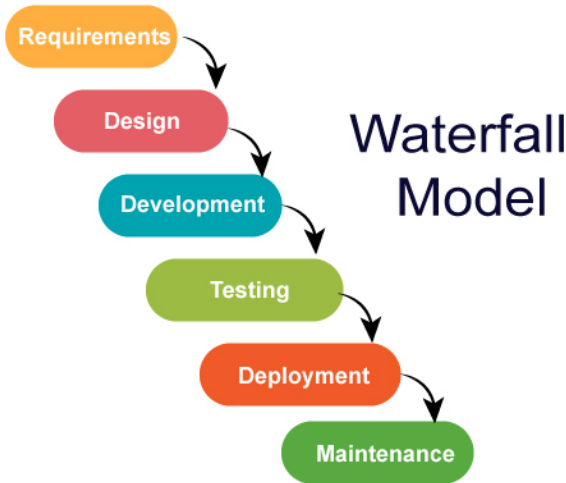
A. Disadvantages of existing system:

1. G.P.S. Integration: The existing module needed to have the feature of G.P.S. integration, making it difficult for renters to locate properties and landlords to manage their listings effectively.
2. Performance Issues: The existing module faced several performance issues, including slow load times, frequent crashes, and extended response times. These issues made it difficult for users to navigate the system and complete tasks efficiently.
3. Security Issues: The existing module had several security vulnerabilities, which put user data at risk. No proper authentication or encryption mechanisms were in place, making it easy for hackers to gain access to user data.
4. Limited Communication options: The existing module had limited options for communication between landlords and renters, which made it difficult for them to communicate effectively and share important information.
5. Inefficient Maintenance Management: The existing module needed an efficient maintenance management system, which made it difficult for renters to request maintenance and landlords to schedule and manage maintenance tasks.
6. It does not have any options for car parking.

V. METHODOLOGY

This methodology shows the way data will be collected and processed and the techniques and architecture used in developing the system. Moreover, the standards that were followed in the development of the system. Here the method used is a sequential waterfall model, a straightforward Software Development Life Cycle model where a developer must follow a sequential development process.

A. Waterfall Model



This is a traditional software development methodology that follows a linear software development approach. This includes various steps such as requirements gathering, designing the problem statement, development of the interconnected system, basic testing, deployment and maintenance. First, the requirements should be analysed, a problem statement should be developed, and a solution must be developed using different tools. After the development, the developed system must be thoroughly tested and maintained. Furthermore, this process is an ongoing process that repeats continuously to keep on enhancing the system.

B. Technical Tools

In this system, we used several tools such as Flutter, NodeJS, MongoDB, Firebase, and React.

(1) Flutter

Flutter is a mobile application development framework used to develop a mobile version of this system, which uses the dart language internally. Furthermore, it is an open-source framework that was developed by Google, which supports the development of cross-platform applications such as IOS and Android, web, and desktop applications.

(2) NodeJS

NodeJS is a backend framework based on JavaScript language, an open-source program that runs on top of chrome's V8 engine, which is used as a compiler for the chrome browser. This framework is used to write the backend code much more accessible. Furthermore, it allows us to write asynchronous JavaScript code.

(3) MongoDB

MongoDB is a non-relational and NoSQL database management system. Furthermore, it is based on key-value

pairs, which is much more secure when compared to traditional SQL databases and also provides some resistance against SQL injection.

(4) Firebase

Firebase is a set of hosting services for various types of applications such as IOS, Android, Java, NodeJS, and Unity. Alongside this also provides real-time NoSQL database hosting.

(5) React

React is a Javascript-based U.I. library that Facebook developed. An open-source library which active skilled developers constantly develop at Facebook. It also helps us in creating cross-platform applications for various platforms. We use React to develop a web interface for this house rental system.

(6) AWS S3 Cloud Instance

Amazon Web Services S3(Simple Storage Service) is a cloud-based storage service provided by Amazon. It is designed for providing a durable and scalable cloud solution with highly available file storage. And in this project it is used for storing all the images related to the property which were uploaded by the owner and generating the links for those images to show those on User Interface.

VI. SYSTEM ARCHITECTURE

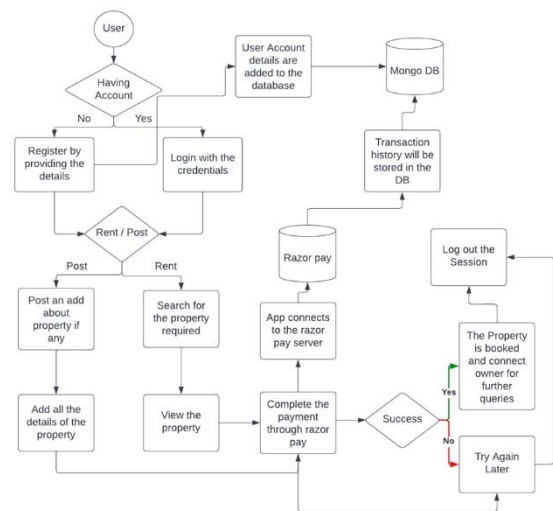


Fig. 1. Flow of Rental house system

In this system, the user needs to enter the system by logging in or signing up. If the user does not have an account, then the user needs to one by signing up. Moreover, the details will be stored in the database. Then, the user needs to log in to the system using those details. Where the system verifies the credentials with the database, the user will be forwarded to the dashboard page, which shows the available properties at that location. Furthermore, the user needs to purchase a monthly or yearly subscription to view all the available properties. This allows him to view the premium properties and even has more options like add to favourite and transaction history options. Furthermore, that particular user has the option to post the property also.

Moreover, the Tenant can chat with the property owner and even request a few more photos regarding the property.

VII. PROPOSED SYSTEM

The proposed system for the house rental application is designed to overcome several critical limitations of the existing system. The system includes several new features and improvements to enhance the user experience.

A. G.P.S. Integration

The proposed system includes a G.P.S. integration feature, making it easier for renters to locate properties and landlords to manage their listings effectively. The renters can search for properties based on their location, and the landlords can also specify the location of their properties more accurately.

B. Performance

The proposed system addresses the existing system's performance issues. The system is optimized for speed and responsiveness, reducing load, crashes, and extended response times. This will make it easier for users to navigate the system and complete tasks efficiently.

C. Security

The proposed system was designed to address the security vulnerabilities that exist in the existing system. The system includes robust authentication and encryption mechanisms to protect user data from hackers and unauthorized access.

D. Payment

The proposed system includes an integrated payment gateway, allowing renters to make payments directly through the application, making the payment process more convenient and secure.

E. In-App Messaging

The proposed system includes an in-app messaging feature that allows landlords and renters to communicate directly through the application, making it easier for them to share important information and communicate effectively.

(1) Proposed System advantages

- a. It is much more secure as we used a trusted payment gateway
- b. Fast loading
- c. Beginner-friendly UI
- d. It has an option for searching for car parking spaces also.
- e. Eliminate paper-based work.

VIII. CONCLUSION

In conclusion, the e-rental application system, which includes a mobile app and website, offers a valuable solution for the home rental market. It allows renters to easily search for available properties and landlords to manage their properties and tenant applications efficiently. The system also improves transparency and accountability in the rental process through features such as online

payments and automated lease agreements. Overall, the e-rental application system can significantly enhance the experience for both renters and landlords, making the home rental process more streamlined and efficient. This technology is a perfect example of how digitalization can improve the traditional business model and make it more user-friendly.

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