
PGForYou: A Framework for Facilitating Paying Guest Search Method

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Abstract

Every individual who wants to relocate from their city or house just wants to get a place where he feels at home. If a student is relocating for studies or an employee is relocating for his job, then they need a living place near their school/college or office. Paying guests (PG) is a perfect and affordable option for such an individual as they do not need to care about security, food, or cleaning, and also it feels like home when it gets compared with a Hostel room or rented flat. Available solution is primarily focused on buying and selling property and renting commercial and residential property. PG is a secondary option. This paper suggests a dedicated web application for PG searching facilities in their nearby location. PGs are ranked with the help of a keyword extraction mechanism. Application is developed with Android framework, Angular JS, Express JS, Msg91, Mapbox and Cloudinary. The proposed application will solve the accommodation problem of the user in an efficient and optimized way.

Keywords. Paying Guest, Web applications, Android, rating

1. INTRODUCTION

Metro cities of India are the foremost centre of education, businesses and jobs. People are migrating from rural areas to urban areas or metro cities for better education and employment. These people are mainly facing issues related to accommodation. Each and everyone expects a neat, clean, stable and low-cost accommodation. There may be various options of accommodation such as hostel, rented house, rented flat and Paying Guest (PG). PG is one of the best choices among all other available options due to its benefit, as shown in figure 1. [1]. A PG is a better option than a flat or hotel room as you don't have to worry about food, security, etc. Consider a scenario where a first-year student belongs to a different state or locality. Being a stranger in the city will be hectic and take lots of time and energy as a student, and their parents visit PG by themselves and ask for pricing, security, etc. He needs accommodation around his nearby Institute which can save transport costs, provide good food facility, low-cost maintenance, and a homely environment. If all these problems are solved by browsing a particular application, a user's life will turn out to be very easy and accessible. This problem is the same for the employee relocating from their city to work. So, in this paper, we are trying to overcome all such problems with our android based framework. The user can search the PG in their nearby location.

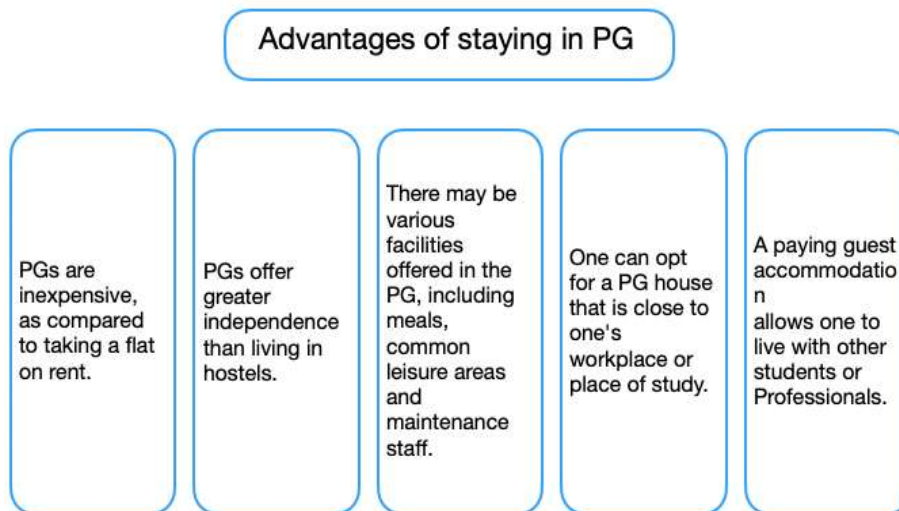


Figure 1. Advantages of PG

PGs are rated on the basis of user feedback utilizing the concept of natural language processing (NLP). This application will be useful to anyone searching for an efficient place to stay.

This paper is organized into subsequent sections. Section 2 represents a brief related work. Section 3 represents the proposed methodology. Section 4 represents the result and discussion. Finally, section 5 concludes the work.

2. RELATED WORK

India has the world's largest population of 5-24 years, which provides a great opportunity for the education sector [2] and observes a rapid growth in the number of educational institutions [3]. Many Android-based apps are proposed and used to connect students and college[4-6]. PGs and Hostels are also an integrated part of education and seeking attention. PG is a place where users/students can stay for three or four years in a very convenient manner that too very low cost. We have researched multiple sites related to PG search and came across they were primarily focused on buying and selling property, Residential and Commercial places for rent, etc. PG is a secondary option. Reference [7] proposed online accommodation, but we would like to focus only on PG. The user wants to search PG for accommodation; he only needs information like pricing, distance from college/office, food, security, the experience of other users, photos, and price comparison. Existing available solutions have their broad view, while students are only looking for their own perspective. However, students can also select a hostel and a flat, but PG is a combination of both and hence becomes a key solution for accommodation [8]. There is always a need for specific solutions that can only be dedicated to students or trainees. During Covid-19, small houses in the metro city are one of the main reasons to spread of this infectious disease among their

family member. PG can also play a pivotal role in mitigating the spread of infection [9]. Keyphrase extraction is extensively used in many fields, particularly website ranking [10], and provides recommendations of any product or brand based on customer feedback [11]. Further, the rank of PG will also assist the user in searching the PG in less time. AI and Machine Learning techniques with Natural language processing (NLP) extract the most important keywords from text [12] for PG recommendation.

This motivates us to propose a key solution that can primarily focus on students' requirements. Apart from the user side, we can also give PG owner a separate window where he provides description, pricing, availability of PG, etc., on the website. PG on site will rate/rank according to NLP based on positive or negative comments of the user. So overall, our objective behind this paper is to provide a single platform for paying guest solutions to users that is very easy to understand by him, saves time and energy, and also on which he can trust.

3. PROPOSED METHODOLOGY

Our objective is to propose an online application to book a paying guest that is available nearer to colleges/offices. In this application, there is a separate module for the user and a PG owner. There are various websites and applications working in the current framework, but they are discrete and arbitrary. Now we are trying to convert it into one particular website. Our application helps users take a virtual tour of PGs via photos and videos; by this, they don't need to visit the different PGs physically.

3.1. *Technology Used:*

This application mostly utilized free and open-source software (FOSS) to build the front end and backend. FOSS is offered active tools that can be quickly employed in corporate, research and academia [13]. The following tools are used to build the proposed work:

- **Bootstrap:** An open-source framework, i.e., Bootstrap, is used to build a proposed web application where HTML is used for front-end design, CSS beautify the web page, and Java Script offers the facility of validations. Bootstrap contains different design templates for forms, buttons, navigation, and other components. Bootstrap support all browser and offers lightweighted and customizable.
- **Node.js** provides a runtime javascript environment that implements javascript outside a web browser with the help of the V8 engine.
- **Express.js** is the backend web framework for Node js.
- **MongoDB** is a NoSQL, document-oriented database in which data is in the JSON format. This is used to store all kinds of information related to PG. It also provides technical support for the cloud environment.
- **Msg91** provides API's for SMS, Email, Whatsapp, Voice, and Authentication. This is used for mobile phone OTP. Verification of a user in the proposed application.

- **Cloudinary:** It provides cloud-based Image management services. This is used for managing and storing all PG's Images.
- **Mapbox:** It is a custom online map provider. This is used to locate PG on a map. Mapbox can quickly deal with heavy traffic websites with simple coding.

3.2. System Design

After identifying of problem, tools and technologies required for the system, the next step is to design the framework or system. How the system entity interacts with the proposed system and how the data flow from one process to another process or entity during login and registration of a user represented by a login and registration Data Flow Diagram (DFD), as shown in figure 2 and how user and PG owner entity interacts with the system and how the data is flowing from process to another process shown in Figure 3. and Figure 4 respectively. OTP mechanism is used to verify and validate the user.

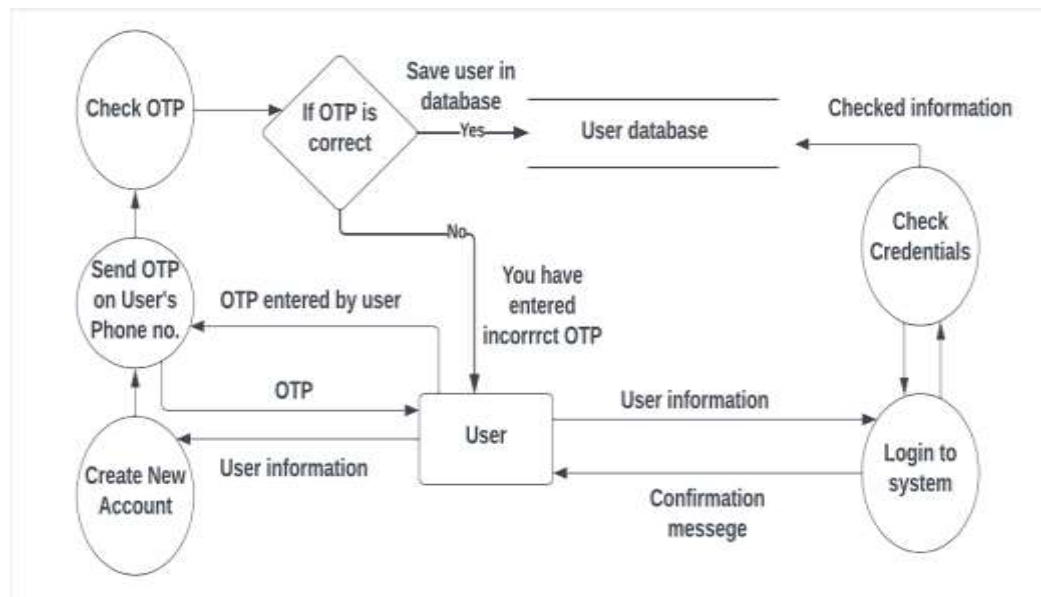


Figure 2. Login and Registration DFD

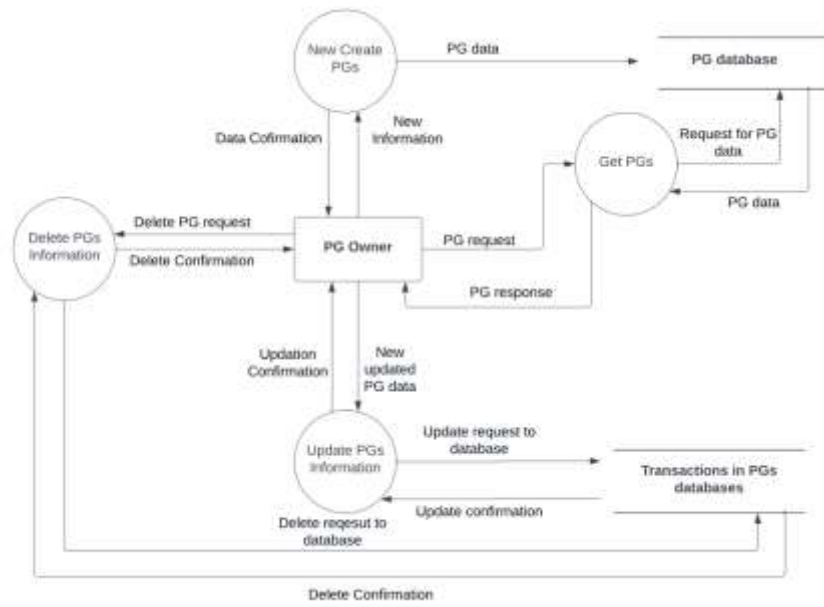


Figure 3. PG owner DFD

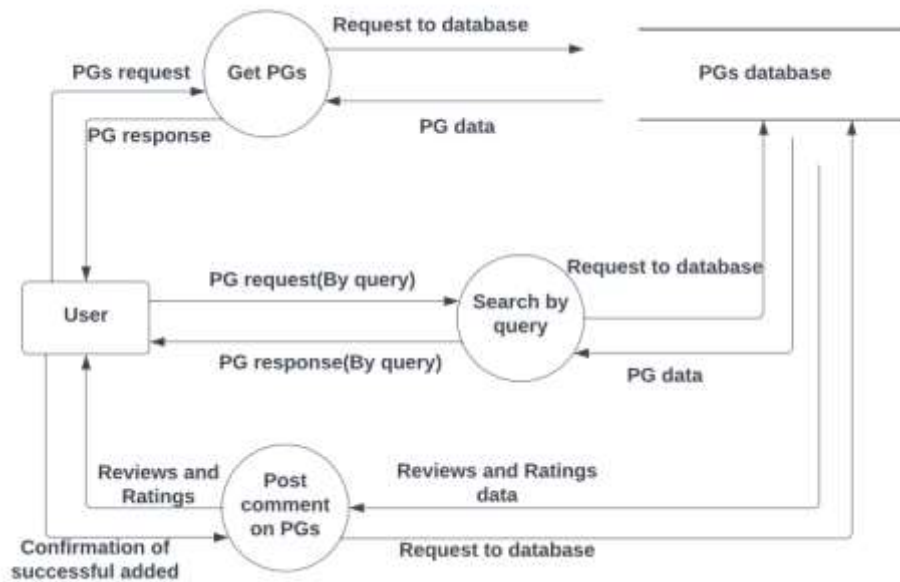


Figure 4. User DFD

An interesting feature of this proposed android based framework is its ability to rate/rank PG. According to figure 3.3, the system collects comments or feedback from the user who has been admitted in PG. User feedback/comments are keywords such as 'good' or 'bad', and their synonyms are extracted from the feedback text and utilized for the rating of PG. The concept of NLP has been taken into consideration to extract keywords from the posted comment of the authenticated users. Here, authenticated user means whoever has taken admission/exit in a specific PG. Not all users' comments who have just visited the site will be counted for rating purposes.

3.3. *Module Description:*

The proposed android-based framework consists of four main modules.

Admin Module: Manages all the data and corresponding access rights of PG owner and user. This module can View/Edit the details of the PG owner and user.

PG Owner Module: The PG Owner can start the process with login after signup with a phone number. PG owners can quick add/delete/update the PG room details with images and videos. Images can store in the cloud and hence optimize the storage capacity. Figure 3.2 represents work flow of PG owner.

User Module: The user will also register with the signup process and connect with the user ID and password. Users can search for location-wise PG, room details, and price and can take a virtual tour of PG via photos and videos. Mapbox will help the user to find PG on the map. User can view list of top ten PGs, which is rated on the basis of the authenticated user.

Rating of PG: Generally, users wish to search for a top ten PG in their respective location. How to rate the PG is a challenging task. The proposed framework solves this problem. The system automatically rate the PG according to the feedback of users in particular PG. Positive keywords such as 'good', 'best', 'ok' and other synonyms are extracted from the feedback and rate according to maximum number of positive keywords for a particular PGs.

4. **RESULT AND DISCUSSION**

The proposed framework named as "PGForYou" offers online PG searching services to users. Application is developed by using HTML, CSS and ReactJS. Screenshots of developed applications are represented in figures 5, 6,7, and 8. On the website, the location of PG is also viewed on the map by which a user gets satisfaction with the exact location of PG. If a user selects a PG for booking, then he is required to SignUp with his phone number via OTP verification. Then a user is allowed to talk with the PG owner directly if he wants.

The image shows two side-by-side screenshots of the PGForYou application interface. Both screenshots feature the PGForYou logo at the top, which consists of a mobile phone icon and the text 'PGForYou' with the tagline 'Make PG searching easier...'.
 The left screenshot is titled 'Sign up' and contains the following elements:
 - A 'Phone number' input field with the value '9808170148'.
 - An 'Enter your OTP' input field.
 - A green button labeled 'Verify your OTP'.
 The right screenshot is titled 'Enter your details' and contains the following elements:
 - A 'Username' input field.
 - An 'Address' input field.
 - A 'Password' input field.
 - A 'Select your role' dropdown menu.
 - A green button labeled 'Register'.

Figure 5. Sign up and login page

In case, If requested PG and rooms are not available currently, then the user can add his request in his wishlist.

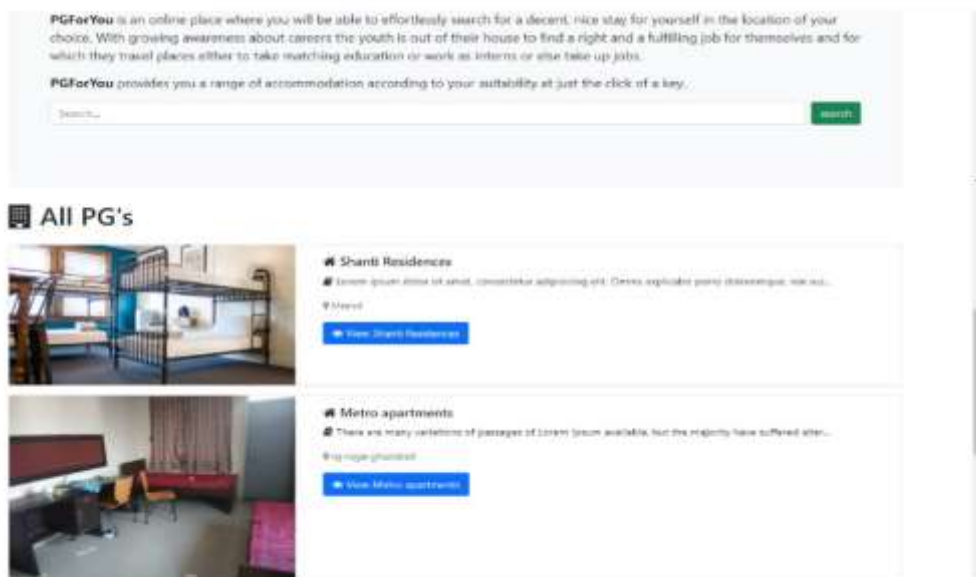


Figure 6. Home Page of PGForYou Application

✎ Edit existing PG details

Title
Metro apartments

Location
rj nagar,ghazipur


Add Images No file chosen

Description
There are many variations of passages of Lorem Ipsum available, but the majority have suffered alteration in some form, by injected humour, or randomised words

Shared Room Price:

Single Room Price:

Delete Images you don't want:


 Delete?


 Delete?



 Delete?

Figure 7. Edit of Existing PG Details

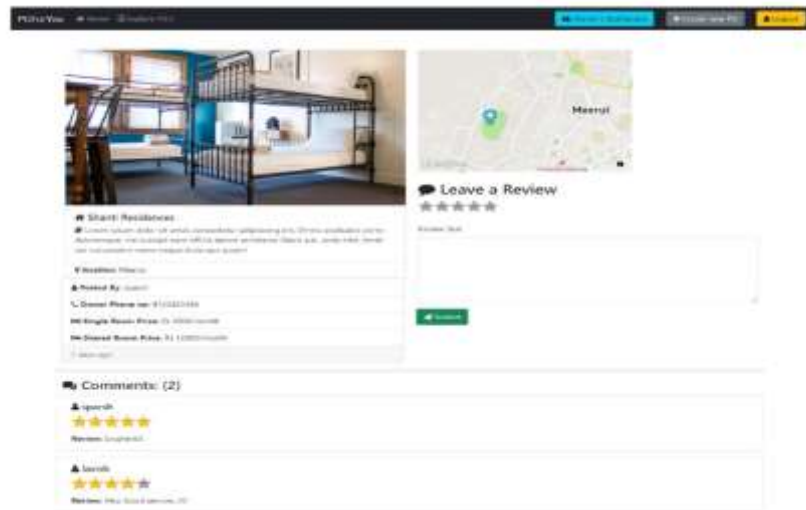


Figure 8. Glimpse of PGForYou

We want to extend this work with the advanced technology of flask and flutter [14]. Rating of PG may be implemented by the page rank algorithm [15]. AI and Cloud-based technology

may make PG finding activity smart and intelligent [16]. With the help of ratings provided by different authenticated PG users, a new user will be able to choose the best PG from the available options. With the help of a page ranking algorithm, a user will automatically suggest the best PG according to their requirements and budget.

5. CONCLUSION

'PGForYou' is a user-friendly android based framework that enables the user to search PG with respect to location. The application utilized node.js, express.js, Msg91, Mapbox and Cloudinary. Mapbox provides PG on map, and Cloudinary offers cloud storage to image data. The application helps the user to search best PG in their nearby location. The rating of PG is based on feedback to make the search easy. NLP is used to extract keywords from feedback and rate them according to the maximum number of positive keywords.

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Biographies



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Dr. Pushpa Singh is an Associate Professor of CSIT Department at the KIET Group of Institutions, Delhi-NCR, Ghaziabad, India. She has more than 18+ years of experience teaching B.Tech and MCA students. Dr. Singh has acquired MCA, M.Tech (CSE), and Ph.D. (CSE) in Wireless Networks from AKTU Lucknow. Her current areas of research include performance evaluation of heterogeneous wireless networks, machine learning, blockchain and cryptography. She has published 50 research publications in reputed international journals, conference and edited book. She has published four books and contributed six book chapters in international publication. She is one of active reviewers of IGI, Springer, and other conference proceedings and journals. She has been invited to serve on various technical program committees