SMART INDIA HACKATHON-2018

Ministry Category : **Ministry of Railways**

Problem code : **#MOR4**

Problem Statement : **Management of Railway Rest Houses & Holiday Homes**

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Idea Brief

1. **Major Goal** :

   To tackle the problem of allocation of accommodation in railway Rest houses and holiday homes by making a website for the same. (Also creation of an app in the future after the completion of the website whose working principles will be nearly same as that of the website)

2. **Idea** :

   The idea is to create a website which would handle all the requests of accomodation, verify if the accommodation is possible, send a verification code/ verification email and book the room.

3. **Policy** :

   The policy we used while building plans for the system :

   http://www.secr.indianrailways.gov.in/uploads/files/1504176335649-rh_cer.pdf

   If the current policies demand any changes, all those changes will be included. The framework of our system will be such that including the new policies will require bare minimum changes into the code.

   Refer to Appendix-1,2 for complete detailed solution of the system and policy

4. **Technology Stack** :

   a. Back End Stack : Server → Linux → Apache → MySql → Php / Python
   b. Front End :
      i. For Browser : Browser → HTML → CSS → Javascript
      ii. For Android (If time permits): Native Android Application

5. **Pre-Requisites** :

   Access to the Employee No. (Unique id) and the contact info such as email or phone linked to it of all railway employees which is given to them by the Government

6. **Approach (Client-End)** :

      The Following are the main basic pages and how the user will see it working. All pages would be a interactive and adaptive designed for all devices (These pages will be created by the front end stack as described above). For much more detailed analysis or if anything is not clear please look at Appendix-1,2 where the procedure is described in much detail-

- a. Login page :
  - i. Asks username and password
  - ii. Registration page if not already registered
  - iii. Link to Guest house Login page
- b. Registration page :
  - i. Asks basic info such as name, Contact no.,etc
  - ii. Asks for the User's Unique id (UID) which is provided by the Railway Dept.
    1. Treats the user as a Guest/Non Railway Employee if no UID provided
    2. Else treats the user as a Railway Employee if UID given
  - iii. Registration of Guest house account will be done by the Railway Department and this page will not be open to the public.

- c. User types/ Account types :
  - i. Railway Employee :
    1. Can book rest-houses on or off duty.
  - ii. Guests / Non Railway Employee :
    1. Can book rest-houses following the current policy for booking (or the one provided in the link)
    2. Will be the first in priority to be asked to vacate if rooms are not available during any emergency
  - iii. Rest house account:
    1. A basic Guest house account which will only contain the details of the rest houses. Only the resthouse manager will have the access to this account.
    2. The work on this account will be limited to verifying the info given online about their rest-house is in sync with the current situation. If not they can edit their parameters (e.g. no. of empty rooms, no. of people staying, etc).

- d. Main Page :

  - i. The Contents of this page will include :
    1. A link to the booking page
    2. Updates from Dept. of Railways

ii. A link to view his profile and update his basic info

e. Booking-Page - 1:
  i. Will ask for the city/town name the user wants to visit.
  ii. After the above step the page will update to display all the Rest houses near the area and their status like no. of vacant rooms, no. of Occupied rooms, etc.
  iii. On clicking on any of the Rest house it will redirect to Booking-Page -2
  iv. If the user is railway employee then priority level of stay will also be asked namely - On duty / Off Duty / Emergency

f. Booking-Page -2 :
  i. This booking page will contain all the details of the resthouse the user has click in Booking-Page-1.
  ii. Will also contain a form that user has to fill which will include
     1. Start Date
     2. End Date
     3. Purpose of visit (for records)
     4. No. of people who are staying with him
     5. (Other items contained in the policy which you can see in the appendix)
  iii. Will also contain a confirm booking button which will redirect the user to payment page

g. Payment Page :
  i. Payment will be done as per current prices.
  ii. This payment will be paid into the account no. of the rest house i.e. the one which was entered during the creation of the rest house account by railways.
  iii. Payment can be made via all major banking portals - SBI,ICICI,PNB,etc.
  iv. If payment successful the booking parameters will be updated on the Resthouses's account

h. After vacating a mail will be sent to the person which will redirect him/her to the page where he/she can give ratings and reviews to the Guest house they stayed in. These ratings will be stored and displayed in the Guest house account and in future will help the users to plan on booking a room in the rest house, and will also help the government to improve their stay.

i. Points to note on :
  i. The Policy demands various checks for Guest/ Railway employee while booking the rest-houses. All those are included and will be checked while booking. (Refer to Appendix-2 for more details)

      ii.   Email will be sent to the respective account holders to confirm their booking.

      iii.   E.g In case of "Guest of a certain railway employee" email will be sent to that employee to confirm the booking of his guest. (a particular case of Non-Railway employee booking a rest-house)

      iv.   Booking system will be like the railway waiting list system, i.e. a person can book even though all rooms are full, but he will be in the waiting list. If someone vacates the room due to an emergency the room will then be alloted to the one higher in the waiting list/Priority list.

      v.   Railway Employee will get more priority than a non railway employee and hence their booking will float on top of the priority list.

      vi.   Money will be refunded if booking doesn't gets confirmed.

7. Approach (Server-End) :

a. Server End code would be in Php/Python
b. The model would be session based. A session would terminate after a decided amount of time or when the user logs out.
c. All the details and preferences of a user account will be stored in mysql database in the server. The password will be stored in hashes to increase security.
d. When a user logs on his session will be activated and all the details of his session/(all his session variables) will be taken from the sql database.
e. Similarly when the user logs out his session variables will be stored back in the database.
f. Each webpage which is sent to the user will be his own personalized web page which will be built in the server using the user's preference.
g. For Each Rest house there will be a stack called priority list where each booking will be stored.
h. Bookings with higher priority (see Appendix 1,2) will float to the top of the stack and the ones with lower priority will sink down.
i. Rooms will be given to those on the top of the stack

8. Further Improvements :

We can modify this website to work for any government organisation such as Income tax,etc i.e. all those govt organisations which are dealing with the same problem. We are open for any suggestion or ideas.

9. **Resources :**

Below mentioned are the resources which we used while planning. (Apart from these resources a lot of help was given by the parents of two of our members who are in Indian Railways and they gave many feedback about how the system works and what are the difficulties they face when booking rooms.)

    a. http://www.indianrailways.gov.in/railwayboard/view_section.jsp?lang=0&id=0,1,304,366,390,412,1158

    b. http://www.secr.indianrailways.gov.in/uploads/files/1504176335649-rh_cer.pdf

    c. http://www.indianrailways.gov.in/railwayboard/uploads/codesmanual/EngCode/chapter-xix.htm#1953

APPENDIX - 1 : Semi-Detailed Analysis of the whole System

This Appendix is a General idea of how are the things going to work. Some of these information have already been included in the *Approach* Section above. Note that the ideas which we are including in this because of

- There will be 3 types of account
  - Railway :
    - Railway Employees will be identified by their unique Employee no. provided by the Government
    - Hence all users under this account will have to provide their employee no.
  - Guest :
    - These accounts are of Non railway employees i.e. those users who won't provide a employee no.
  - Rest house :
    - These accounts will be created by Ministry of Railways and will be given to each rest house in India. These rest houses will manage this account.
- On booking a confirmation email will be sent to user. (This ensures that even though if password of any user is leaked no 3rd party can use any accounts to book rooms for their purposes without the authorisation of the railway employee)
- On booking an email will also be sent to the manager of the Rest house where it was booked telling him about the details of the employee, so they can better manage the rooms, cleaning, food and all before they arrive.
- The Duration of stay will have to be provided during time of booking. The payment is to be done only for these days.
- When the stay is over the Rest house account has to confirm the vacation. If this confirmation of vacation is not done by rest house, the extension period of the employee will start immediately (if and only if there are no pending bookings for that room.). Once this period starts an email will be sent to the employee stating that his extension period has started.
- Once in the extension period new charges will be put (as per the current circular) on the no. of days the employee stays.
- Like before the Rest house account is responsible for the termination of extension period. I.e. the extension period will continue until the rest house confirms that the employee has vacated. Once this is done a bill will be prepared automatically for the extension period for which the employee stayed and he/she will have to pay at the rest house itself.

- Extension won't be granted if all rooms are booked and a new booking is pending for the room. In such cases the employee has to vacate and failing to do so will allow the rest house to take legal action.
- While booking a railway employee will have to choose if he is On-duty/ Off-duty/ in an Emergency. This option won't appear while a guest is booking.
- The booking procedure will be waiting list based. The one on top of the list will be given the room for accommodation. The priority list will constantly keep on changing even while the room is occupied. If due to any reason the top of the priority list changes the person will have to vacate.
- Bookings of Railway employee will always float above guest. On-duty bookings will float above Off-duty bookings. Emergency Bookings will always float above all other bookings. (Hence in an emergency the top of the priority list will change and the one currently residing will have to vacate to give the room to the one in emergency)
- Whenever the priority list changes an email will be sent to those who are visible affected by the change notifying them of the changes.

APPENDIX - 2 : Implementation of the policies given (going into deep details)

This Appendix is about how are we going to follow the policy which is given under policy tab. Hence all the following are in reference to the circular No. 2005/LMB/3/34.

- Occupation of Railway Guest Houses By Non-Railway officers :
  - Railway Employees will be identified by their unique Employee no. provided by the Government
  - Hence those users who doesn't have this no. will be treated as Non- railway/ Guest accounts and will come under this section
  - Max Stay duration is subjected to 4 days under this account
  - While booking they can book their **starting date** from 7th day from today upto 23rd day from that day (i.e. only these dates will be shown on booking calendar) corresponding to the points (A)-2,3,4 of the circular.
  - Their **Ending Date** will be restricted to 4 days from the **starting date**. If there are no further bookings and they are still at the top of 'priority list' (see Appendix-1) they can extend their stay until they lose their position from the top of the list or until they decide to vacate. This extension vacating procedure will be same as that described in Appendix-1 (i.e. room will be considered occupied until the Rest House account confirms the vacation of the room)

- - Extra charges of damages will have to be taken by the Guest House itself and wont be included in the scope of this project.

- **Occupation of Guest of Railway Officials :**
  - While booking Guest account can provide the employee no. of railway officials. If this is provided this booking will be treated as Guests of Railway officials/ Family of railway Officials.
  - In such cases 2 emails will be sent. One to the guest and one to the email whose Employee no. this guest has given. The booking will only be confirmed when both of these emails will confirm it.
  - If this booking is not confirmed within a certain time it will be cancelled.
- **Occupation of Special - Guests (those mentioned in point - (E),(H),(K),(M)):**
  - There are two ways to handle these -
    - The Gov can give unique ids similar to the ones the railway employee have. We can then identify these members from their id whenever they book and their charge would be as according to the circular.
    - We can use the unique id of their own dept. (if Member of parliament , Staff of CRIS, etc have such a thing). We can incorporate these ids into our database with the prices specified in the policy so that whenever they book rooms they can be charged exactly as mentioned in policy.
  - They can log in as railway officials using the ids given to them, and as mentioned earlier the rates which they will have to pay will be taken from the database.
  - Retired railway officials can use their old employee ids, whose rates in database will be modified to the retirement rates.

There are many more implementation on the policies. And this can be much more improved with help of more ideas. We will encourage anyone who has any idea to add to this. Together we can create this self sustaining system which will take out most of the problems and difficulty in the field of Management of rest houses and Holiday Homes.

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