

Housing Society Management, Authentication and Security App

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Abstract— The standard of living in urban areas such as towns and cities has increased so much that most of the people are living in a housing society. When a person moves into a new housing society he is unaware of the various facilities provided by the society and his surroundings. Also a person who is already a resident of the society may have issues concerning whom to contact for various repair works, report his grievances, security issues etc. There is no proper platform for the resident to communicate with the admin. Housing Society Management, Security and Authentication app provides the solution by offering a platform to share issues between residents and the society managers which leads to rapid issue resolution and fewer misunderstandings. In the current scenario there is no proper alert mechanism to inform residents in case of emergencies such as gas leakage. Keeping track of people visiting the housing society is also a herculean task. Our project resolves these issues by making use of gas sensors and RFID technology.

Keywords—Authentication, Gas Sensor, Maps, RFID, Security,

Squared way Chicago which has already been designed is a tenant/landlord web app which was made to support both the tenant and landlord and it can

- Communicate repair issues
- Collect data and inform about the trends in rental housing market
- Limitations of existing system
- It cannot send push notifications to the user.
- The admin and the resident can communicate only through email.

INTRODUCTION

This app enables the admin to login to the app and then the resident's login details will be created by the admin after which the resident can login to the app with the details provided. The residents can then access the maps for navigation around the society and find the necessary facilities like schools, hospitals, supermarkets, shopping centers nearby. They can also report their grievances regarding various issues faced using the app and also make suggestions for improvements. The admin can then view the grievances and update the status of the action taken towards resolving the issue under consideration. For providing authentication and security we will be using RFID technology. Here we make use of a RFID reader module which scans the RFID tags provided to the visitors and sends the tag id to the Arduino which is further sent to the web server through esp8266 wifi module.

The admin can then keep track of all the visitors by viewing their details such as the entry time, date and the apartment visited. Our project ensures safety in case of gas leakage and this is done by using the mq2 gas sensor which senses the gas in case of leakage and sends the notification to the user through esp8266 wifi module.

EXISTING SYSTEM

PROPOSED SYSTEM

The features of the proposed app are as follows:

1. Allows admin to register with the app, residents login details will be created by the admin and the resident can login to the app with the details provided.
2. The residents can then access the maps for navigation within the society and find the necessary facilities like schools, hospitals, supermarkets, shopping centres nearby.
3. Residents can also report their grievances regarding various issues faced using the app and also make suggestions for improvements. The admin can then view the grievances and update the status of the action taken towards resolving the issue under consideration.

4. For providing authentication and security we will be using RFID technology. Here we make use of a RFID reader module which scans the RFID tags provided to the visitors and sends the tag id to the arduino which is further sent to the to the web server through esp8266 wifi module. The admin can then keep track all the visitors by viewing details such as the entry time, date and the apartment visited.
5. Ensures safety in case of gas leakage and this is done by using the mq2 gas sensor which senses the gas in case of leakage and sends the notification to the user through esp8266 wifi module.

DESIGN

The below figure shows the system architecture which illustrates the way the communication happens between the admin and residents. The users access the app and they are navigated to their respective screens based on their login information. The data exchange between admin and resident is achieved through database and the application is stored on wamp server. The wamp server acts as an intermediate for the interaction between the resident and admin.



Figure 1: System Architecture

1. SERVER

The server used in our project is the Wampserver. In this stack, Microsoft Windows is the operating system (OS), Apache is the Web server, MySQL handles the database components, while PHP, Python, or PERL represents the dynamic scripting languages.

2. APACHE

Apache Web Server is a web server used by most operating systems.

3. MYSQL DATABASE

MySQL database is a central component of the WAMP open-source web application software stack (and other "AMP" stacks). WAMP is an acronym for "Windows, Apache, MySQL, Perl/PHP/Python". Applications that use the MySQL database include: WordPress and Drupal. In our project we create and use the following databases:

- resinfo: To add, delete and view the details of the residents.
- complaint: To report and resolve issues.

4. ARDUINO BOARD

Arduino board consists of microprocessors and controllers. The Arduino board has many digital and analog input and output pins which may be interfaced to various components and circuits. Our project uses the Arduino board to connect the hardware components such as Rfid and the gas sensors and sends the notification to the application through the wifi module ESP8266.

5. RFID

A radio-frequency identification makes use of a mechanism in which tags are attached to the objects to be detected. The RFID tag receives the message and then responds with its identification and other information. This can be a unique tag number, or product-related information such as a stock number, lot or batch number, production date, or other specific information.

6. GAS LEAKAGE DETECTION:

The MQ-2 Gas Sensor module is useful for gas leakage detection in homes and industries. The MQ series of gas sensors use a small heater inside with an electro-chemical sensor. The analog output signal can be read with an analog input of the Arduino. It can detect LPG, I-butane, propane, methane, alcohol, hydrogen and smoke.

7. ESP8266

The ESP8266 is a low-cost Wi-Fi chip with full TCP/IP stack and MCU (microcontroller unit) capability. This small module allows microcontrollers to connect to a Wi-Fi network.

8. ARDUINO IDE

The Arduino project provides the Arduino integrated development environment (IDE). It is an application written in Java programming language. Arduino IDE has a Serial Monitor to view the results such as tag number.

INTERPRETATION OF RESULTS

The first major step is to register with the app. The users access the app and they are navigated to their respective screens based on their login information.



Figure 2: Login Page

In the beginning the user provides his detail which is further saved in the application. Based on the login information they are redirected to the admin/resident's page. In the users page there are various options such as Home, About Us, Resident Details, Report Issue, Security, Gallery, Map.



Figure 3:Home Page

1. **HOME:** This option brings us back to the home page
2. **ABOUT US:** This option gives a glimpse of the housing society.
3. **SECURITY:** To provide security to the residents we will be using the RFID technology and gas leakage detection.



Figure 4:Security Page

4. RFID TECHNOLOGY:

A radio-frequency identification system makes use of a mechanism where it can detect objects which are given unique tags.

Working :

- To provide authentication to the residents of the housing society our app uses a mechanism in which the residents are given the RFID tags.
- The tags are scanned using the RFID reader module EM-18 and sent to the Arduino board for further processing. This tag id is sent to the server through the wifi module ESP8266 which then updates the database along with the details such as entry time ,exit time and his personal details such as name, email id, phone number etc.

- The admin can also get the information about who is passing the RFID checkpoint at any particular time. In this way the admin can keep track of the residents moving within the housing society.

5. GAS LEAKAGE DETECTION:

The MQ-2 Gas Sensor module is useful for gas leakage detection in homes and industries.

Working :

- The MQ2 gas sensor is connected to the Arduino UNO board .On leakage of gas, the sensor sends an analog input to the arduino board.
- The arduino processes this signal and if the level of gas is greater than the threshold value then notifications are sent to the admin and the resident .
- In this way security of the residents is ensured.

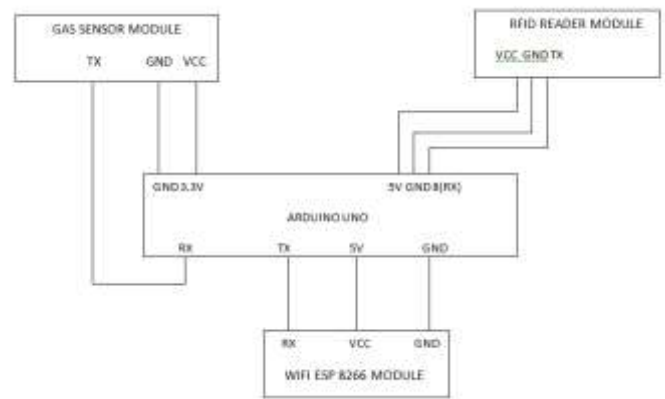


Figure 5:Hardware Connections

6. RESIDENT DETAILS: This enlists the residents of the housing society with their respective apartment number and block number. There is an option to add a resident in which the admin gets to keep track of the residents by adding their details to the database. There is also an option to delete a resident in which the admin can keep track of the apartments that are vacated.



Figure 6:Resident Details Page

7. **RESOLVE ISSUE:** This helps the residents and the admin to communicate. The residents can report issues to the admin and the admin can update the status of the issue.

- Initially, the resident reports his grievances/issues related to water, electricity, garbage etc.
- The admin then views the issues and tries to resolve them. He intimates the residents about the progress of the work done by displaying messages such as DONE or IN PROGRESS.
- The residents can keep track of issues by viewing the updated status.



Figure 7:Resolve Issue Page

8. **MAPS AND GALLERY:** To access google maps and to view the images of various activities conducted in the society respectively.

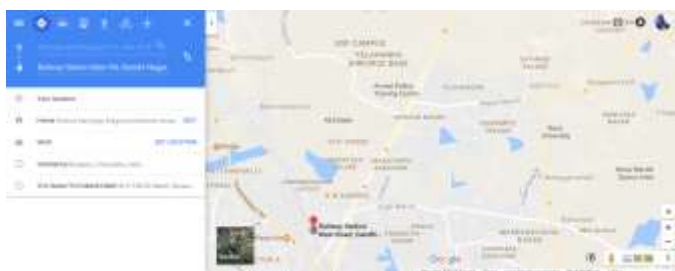


Figure 8:Map



Figure 9:Gallery Page

CONCLUSION

It is very important for a housing society to provide safety and security for its residents. Housing Society Management, Authentication and Security App is a one stop solution to all the issues faced by people residing in a Housing Society. The app provides the solution by offering a platform to share issues between residents and the society managers which leads to rapid issue resolution and proper communication. It has a mechanism to inform the users in case of emergencies such as gas leakage. Keeping track of people visiting the housing society is a herculean task. Our project resolves these issues by making use of gas sensors and RFID technology. Thus it provides complete protection by ensuring Security and Safety.

FUTURE WORK

In the future this app:

- Can be extended to android and iOS Platform.
- Several apartments Database can be included.
- Provide a platform for garden maintenance.
- Alarm in case of fire.

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