Mobile Application for Home Appliance Services

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***Abstract*—In our day-to-day life, many people come across malfunctioning of Appliances and Machineries. Some of us would not think of repairing it whereas some of us do not get the proper service and tend to abandon them which in turn increases the E-Waste. Increasing product lifespan is one of the most effective environmental strategies and therefore repairing machinery is a part of the circular economy approach that aims to keep products and materials longer in use. A surprisingly high share of repairs was conducted by consumers themselves. The main barrier is the consistently low price of new products, and often of poor quality, which contributes to low profitability in repair work for businesses and low motivation from consumers. Furthermore, Access to competent personnel is a major challenge for the repair industry, a need which is expected to increase in the coming years. Many Electricians and Technicians are unemployed in every locality and hence we come with a solution for multiple problems by hiring a network of electricians and technicians, training them and providing home service to the customers at their convenient timings through online service bookings at a regional scale.**

***Index Terms*—mobile application, e-service, review and feedback system.**

I. INTRODUCTION

A. Objective

The increasing electronic waste and unemployment led to the creation of an app that provides repair services to home appliances. This solution reduces e-waste by avoiding disposal and creates job opportunities in the repair industry. To reduce the generation of electronic waste (e-waste) in the country, it is important to adopt sustainable practices such as repairing and reusing electronic products, promoting responsible disposal of e-waste, encouraging manufacturers to produce more durable and repairable products, and increasing public awareness about the environmental and health hazards of e-waste.

B. Motivation

E-waste produced daily on a global scale is of a very alarming size. This is very harmful to our environment. This project is an initiative to bring forth a motivation to reduce electrical and electronic waste. To reduce unemployment, it is important to create job opportunities by promoting entrepreneurship and innovation, investing in education and training programs to enhance the skills and employability of the workforce, providing incentives to businesses to hire more workers, and enting policies to stimulate economic growth and job creation.

C. Relevance of the project

Service-oriented architecture: A software design approach that structures an application as a collection of loosely coupled and reusable services, allowing different components to communicate and interact with each other through standardized interfaces.

Multi-agent technology: A computational system that consists of multiple autonomous agents capable of interacting, communicating, and collaborating with each other to solve complex problems or achieve a common goal.

P2P interaction model: A decentralized communication model where peers (individual nodes or devices) interact directly with each other in a peer-to-peer network, enabling direct sharing of resources, data, or services without the need for centralized servers or intermediaries.

OSGi platforms: A modular framework for developing and deploying Java-based applications that provides a dynamic and flexible environment. OSGi (Open Service Gateway Initiative) platforms allow applications to be composed of independently deployable and updatable modules, known as bundles, which can be dynamically installed, started, stopped,

and updated without requiring a full restart of the system.

Feedback and review system: A mechanism or platform that allows users to provide their opinions, assessments, or evaluations on a product, service, or experience. It enables individuals to share their feedback, ratings, comments, or reviews, which can be used for improving the quality, performance, or user satisfaction of the subject being reviewed. The feedback and review system often includes features such as rating scales, comment sections, and moderation tools to facilitate the collection and management of user feedback.

D. Design Methodology

ADMIN MODULE:

The admin module in the app provides full control over the server and database management. The admin can assign technicians to customers based on regional requirements, generate server reports, handle server-related bugs, and maintain overall server functionality.

CUSTOMER MODULE:

The customer module allows users to log in using their email or phone number. They can book a service request by selecting the appliance and describing the issue. Customers can choose between regular or premium technicians, schedule a convenient date and time for service, make online payments, and provide feedback on the service received.

TECHNICIAN MODULE:

The technician module enables service providers to log in and view service requests in their respective expertise regions. Technicians can select a customer request, access customer details, and provide on-site service. If additional hardware materials are required, technicians can order them through the app from partnered vendors. They are responsible for ensuring customer payment completion and receiving feedback.

VENDOR MODULE:

The vendor module allows vendors to log in and manage hardware and equipment distribution. Vendors receive orders from technicians for required materials and ensure timely delivery to the technicians located nearby. Their responsibility lies in maintaining a smooth supply chain of hardware and equipment for technicians.

E. Abridgement

The app's interconnected modules work together harmoniously to provide a streamlined service experience. The admin module serves as the central control hub, managing the server, database, and addressing any technical issues. Customers utilize the app to book service requests for their electrical appliances, specifying the issue and selecting their preferred technician. Technicians, in turn, access these service requests and visit customers' locations to provide the required services. If additional hardware materials are needed, technicians can order them through the app from partnered vendors. Vendors ensure timely delivery of the necessary hardware and equipment. This cohesive collaboration among the modules ensures efficient service delivery, customer satisfaction, and smooth operation of the overall system.

II. RELATED WORKS

Anakha K Aji[1] the idea of getting a home maintenance technician easily, by linking the user to the provider required smoothly by hiring them and make them reserved. Besides, those people who are in need of items required for their services may not be able to get it at that particular moment. Therefore, we present a feature that will enable the user to purchase that product immediately.

Noorfaizalfarid Mohd Noor[2] Mobile home service recommender application offers smart and efficient interaction to unify digitally the multi background residents in the community to delineate their in house issues such as to get handyman for home service. The current process of getting home service needs data that can be considered and matched according to the issue. Using embedded recommender logic inside the mobile application, it can match the resident’s profile and problem preferences by analyzing the behavior of each item and finally generate personalized home service recommendation solutions. This paper conducted a preliminary study in digitizing home service using recommender approach.It aims to investigate the current behavior of people on getting home service and their readiness to use a tailored mobile home service searching application. It collects data from 339 respondents using social media platforms. The result from the survey shows that mobile applications are common in people's lives. It also reveals that residents are commonly facing issues on piping, home appliances, furniture, gas cooking, baby care, grass

and home maid. To get a solution, people are very dependent on home service.

Laith T. Khrais[3] Most retailers are integrating their practices with modern technologies to enhance the effectiveness of their operations. The adoption of technology aims to enable businesses to accurately meet customer needs and expectations. This study focused on examining the role of mobile application (app) acceptance in shaping customer electronic experience. A mixed method was adopted, in which qualitative data were collected using interviews, and quantitative data were gathered using the questionnaires. The results indicate that mobile app acceptance contributes to a positive customer experience while purchasing products and services from online retailers. Mobile apps are associated with benefits, such as convenience, ease of use, and the ability to access various products and services. With the rapid development in technology, e-commerce retailers should leverage such innovations to meet customer needs.

Wen-Jyi Hwang [4] A novel quality of service (QoS) provisioning algorithm for home networks is presented in this paper. The algorithm carries out the QoS-aware bandwidth allocation using the general regression neural networks (GRNNs). Among all the allocations predicted to receive positive service responses, the algorithm finds the allocation with minimum total bandwidth for the current service. The service response prediction is based on the GRNN with the training set containing the bandwidth allocations and their service responses for past transmissions. The new service responses will then be used to update the training set for the subsequent transmissions. To attain accurate tracking of diversified service requirements, flexible specification of service response levels and QoS levels are provided.

III. EXISTING AND PROPOSED SYSTEM

A. Existing system:

Home appliance services have gained significant popularity in recent times due to their convenience for people. Customers can easily request service from specific providers whenever they require assistance with their appliances. The service providers, in turn, deliver the requested services and generate bills based on the provided services. Various payment options are available to facilitate smooth transactions. Furthermore, customers have the opportunity to review and provide feedback on the services received. One prominent example of a home service provider is Urban Company (previously known as Urban Clap), an Indian gig marketplace that offers a wide range of services, including home repairs, maintenance, as well as beauty and wellness services for customers in the comfort of their homes. Urban Company aims to connect customers with skilled professionals to ensure high-quality service delivery and customer satisfaction.

B. Proposed System:

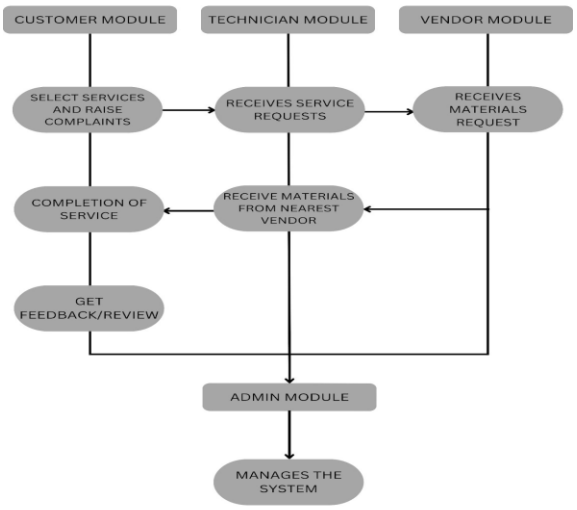

Fig. System Architecture

Request Collection

Request collection is a process of collecting the service request from the customers.The request information such as what service needed to be provided and when to provide will be collected and it will be intimated to the technicians based on the higher experience and the availability.

Allocating Technicians

In this process, once the customer requested for the service it will be intimated to the technicians and the technicians will accept the request and based on the request information the technicians will provide the service with the required tools and machines.

Algorithms Used

1. Sort Algorithms Sorting is the most common and majorly used algorithm in mobile app development.

The basic idea is to arrange the data or items in a definite pattern. Depending upon your requirement, you may want to use any of these.

- Bubble sort
- Insertion Sort
- Merge Sort
- Quick Sort
- Bucket Sort
- Heap Sort

It is essential to know when and where which one is to be used. Few instances of sorting algorithm: Sorting on the basis of technicians's rating and availability.It is very helpful in allocating the technicians to the customer when they need a service and it helps in reducing the time taken for a customer to book a technician.

2. Search Algorithms

Binary Search is used on a sorted dataset. In binary search, the first comparison is made with the mid-position element of the list. If at this stage the value gets matched, then we return the value.

If not and the value is less than the middle element, then it would be present in the lower end of the array and if it's greater than the element would be found in the other upper half of the dataset. This procedure is useful where there are large numbers of elements in an array.

Applications of this algorithm are:

• When you are searching for a service in a sorted list of services, it applies a binary search algorithm and string-matching to quickly deliver the results.

3. Hashing Algorithms

The hash algorithm is the most widely used method to find suitable data by key or ID. We get data by its index. The data format is called Hash-Map or Hash-Table which maps keys to values, easily. You can do value search using these keys. The idea is to use a suitable hash function that performs key-value mapping. Choosing a good hash function depends on the situation.

For example:

- Input Number

10,987

- Hashing Algorithm

Input# x 123

- Hash Value 1,351,401

Developers generally use complex algorithms and quite big hash values for encrypting, like 128-bit numbers. A 128-bit number has a possible 3128, or 4,302,724,769,309,484,634,533,846,174,200,000,000 ,000,000,000,000,000,000, 000,000,000,000 different combinations – this would be like trying to find one particular fish in a vast endless ocean.

The hash function is widely used in encrypting critical data such as passwords and keys.

4. Language Detection Algorithm

As the name suggests, this algorithm takes the text as input and judges in which human language the text input is written in. This algorithm is widely used among those mobile applications, which are designed to perform translations for multiple languages. It is also used in speech recognition software based on the lines of mobile apps such as Google Talk, Siri, Cortana, etc. Spam detecting apps also use Language Detection Algorithms to determine multiple languages and identify in which language emails, comments and the rest of the input is written before spam filtering algorithms kick in. Without such tracking, content coming from different geographical regions which are suspected of spreading spam cannot be adequately eliminated across various platforms.

5. Dijkstra Dijkstra's algorithm has multiple variants, but one of the most commonly used is this one which is used to find the shortest paths from the source vertex to all other vertices in the graph. For instance, a particular area as a geographical map and take this geographical map as a GRAPH. Now the locations on the map are our VERTICES in the algorithm. And the roads between locations are our EDGES. So, the WEIGHTS OF EDGES here are the distance between those two locations. Through this, we can find out the shortest way between the two locations. It used to know the shortest path between two cities,towns,municipalities on a map and is used in many applications such as Google maps. Though It uses more complex and efficient algorithms. But Dijkstra is the basics. It's also used in finding the shortest communication path between two nodes connected to a network. This algorithm is used to find the location of the customer and the allocated technicians and it also used to track the technicians once they accept the service order

IV. CONCLUSION

An Android Application is developed which provides almost all the basic household services. This android application provides a user- friendly and safe

environment and interface for booking the basic services. It is secure as it generates the QR code which is unique for customer and service provider. It will provide regular and timely notifications, so that the user gets updated always. So, this app is very useful to all people and in all aspects. It provides all the basic household services at a reasonable and affordable cost and with much ease.

V. FUTURE ENHANCEMENT

The following features can make this app very effective -- In future, the main focus is to provide a better interface for the app. It will also provide the satellite view of the service providers and the customers, as it is provided in Google Maps. The online database storage will be made large in size so that it can be used in a better way. It will also provide monthly statistical reports of the users and customers as well in the form of graphs and charts, which shows how much they used the app, i.e., active time and their activities in the past months. Map navigation can make the app better. It will help the service providers to find the location of user and vice-versa. It will spot the location of both the users and service providers similar to Google maps.

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