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COMPARATIVE ANALYSIS AND HANDYMAN SERVICES APPLICATION DEVELOPMENT

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ABSTRACT

Android Handyman Application provides users with a fast and reliable means to contact the best odd- jobbers around them. In Pakistan, for a domestic job, the selection of blue-collar workers has always been a challenging task. The main focus of this survey is to create our mobile-based android application, where people can contact handymen. A handyman is a term used to describe technicians, including Carpenter, AC Mechanics, Plumbers, Car Mechanic, Electricians, and Painters. The application was developed using Android Studio, code is written using Java and Android SDK, and to store data of oddjobbers, SQLite was used. The research was conducted based on similar work in the form of literature review and related websites. The inspiration behind this was the difficulties one had to face in finding a skilled person to solve his/her household issues. In Pakistan, there is no such Android-based application available to provide ease to smartphone users.

As the scope of the android application is concerned, statistics indicate that the trend of surfing the internet on smart devices has seen a steep increase during the past few years. This trend is likely to continue due to a drop in the cost and availability of smart devices. Pakistan, being a developing country has huge potential in the field of the mobile software industry, and the rise

in Smartphone usage is mostlikely to be a perpetual entity. These sorts of uses can increase business open doors for jacks of all tradesdivision which is far deserted from the general public, where mechanical headways are advancing stepby step and individuals will in general rely more upon innovation to meet their necessity than any timein recent memory.

INTRODUCTION

As Android Handyman Application gives clients a quick and solid intend to contact best odd-middlemen around them. In Pakistan, for residential occupation, the determination of hands-on laborers has continuously been a difficult errand. The principle focal point of this study is to make our own versatile based android application where individuals can contact jacks of all trades. Jack of all trades is a term used to portray professionals, including a Carpenter, AC Mechanics, Plumbers, Car Mechanic,Electricians, and Painters. The application was created utilizing Android Studio, code is composed utilizing Java and Android SDK, and to store information of odd jobbers SQLite was utilized.Exploration was directed on the premise of comparative work as writing audit and related sites.

The abstract level of the application contains followings assignments from a user perspective and will be handled accordingly:

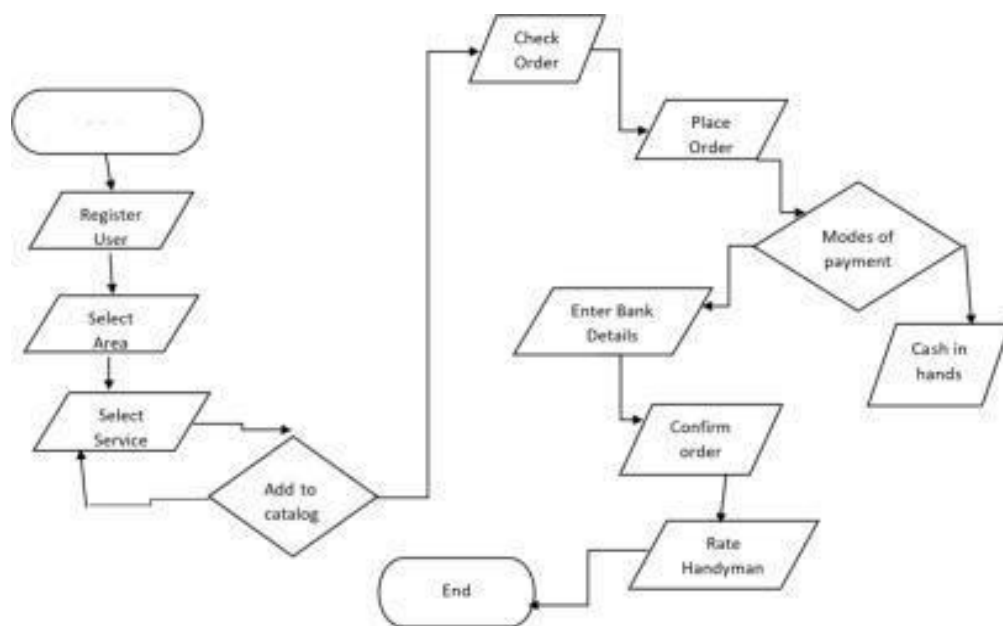


Figure 1: Flow of Application

According to the admin perspective, the tasks are to be handled in the following direction:

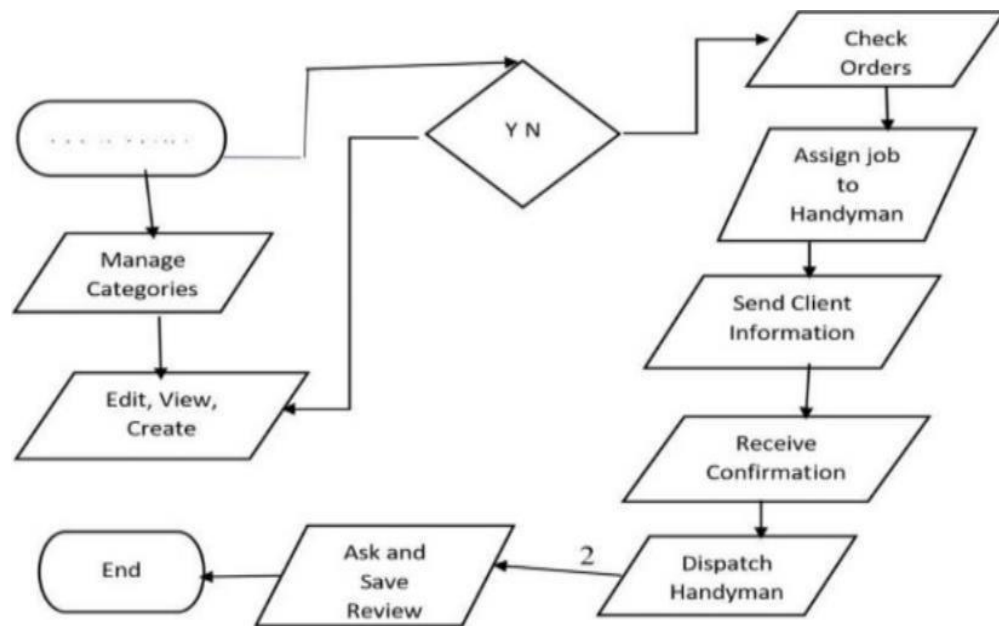


Figure 2: Admin panel of Application

Development of Handy Mobile Application

This exploration paperwork to choose the best specialist for various groups. This assessment paper has been done by taking gatherings to a bunch of people and particular experts. The tools utilized as a part of this venture were Eclipse Application Development Tool (ADT), Ionic Software Development Kit (ISDK), HTML was utilized for IONIC SDK and SQLITE was utilized as a database to store information of different workers. They save the transport expenses of users to find the worker, they overcome the mental pressure of users for their work, and they save the time of the user.[1]

App advancement in android is difficult. Because the improvement stage has diverse conditions at various levels. The development stage includes the arrangement of API's that give entrance to cell phones and system functionalities that utilize the application to work on a particular cell phone. The creator must think about the client's necessity and improvement stage. Plan Application for PC and versatile both are distinctive things. As Mobile applications are the greatest and quickly developing business sector, According to One Research has been made, this market will develop \$17.5bn in the following two years and download would rise from 7bn every year before 50bn by 2012.

Why to choose Android

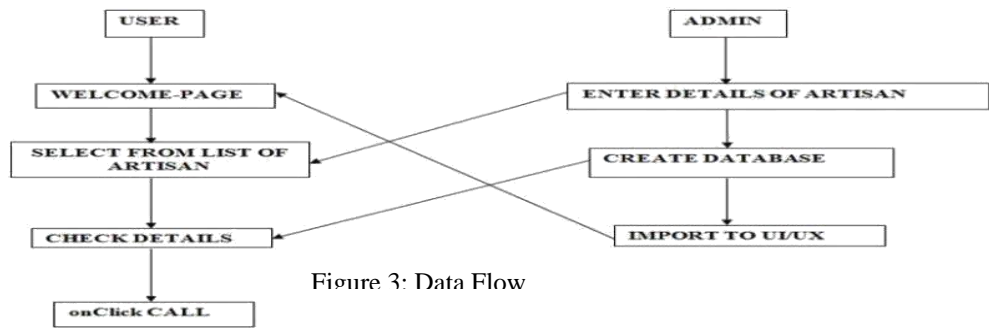


Figure 3: Data Flow

Due to its application, widgets, android market, and multitasking. There is no organized strategy defined for execution assessment in this space which can give data to the product engineer.

We will use Android Studio as a development tool, as it is the ever tool to design the android applications and SQLite as the database. We can improve execution which isn't dealt with in this paper by taking a set number of requests in a day, and remaining requests will be taken following 24 hours. We will graph the handyman feedback and kick off the person who has low feedback consistently. They use just 4 artisans for their work which might not be enough for this project; we will appoint a minimum of 20 workers.

In this architecture, the user cannot see the worker's feedback, and they are not specifying how to call the workers either calling him on their phone number to place order or both. A new worker cannot contact the web directly for work, we will make a signup form for workers who want to work, and they shall submit their skills which will reduce unemployment. Also, there is no bonus functionality for a regular user.

Examination on the Development of new shop application utilizing Android

This paper was about the Mobile Shopping application which is delivered primarily by using Eclipse IDE with Android Development Tool (ADT) module. This framework must be introduced with the Java Development Kit. Android Emulator is utilized to configure, troubleshoot, and test the application in a genuine Android run-time condition for application improvement. [3] The design of the system is:

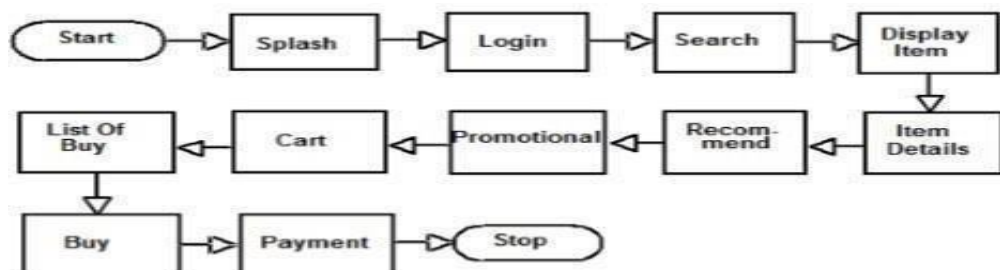


Figure 4: Flowchart of Shop Application

Local Android Application for Home Services

This paper was about Local Android Application for Home Services that is incorporated based on a portable application for android clients that unites the customer and specialist co-ops and interfaces them utilizing the GPS. As indicated by their examination Clients ask for the home administrations and in light of the area by bringing the scope and longitude of the customer, the closest specialist organization is appointed to serve the customer needs. Also, make this application convenient. Tools that were used in this project are Android SDK, Eclipse, Java, MySQL for the database.[3]

"Facility Kart" is a momentum running application which is doing likewise work that it is in this examination. This application gives administrations like home cleaning, Laundry Services, Driver on Demand Services, Carpet Cleaning Services, Sofa Cleaning Services, Pest Control Services, Electrical Services, Plumbing Services, AC Services, Carpentry Services, Car Spa, PC and PC Repair, Refrigerator/Microwave/Washing Machine Services, and Home Painting.

It includes administrator Module, Services Module, User Module, Feedback Module. This application doesn't utilize the GPS (Global Positioning System) which is accessible on all android gadgets for recognizing the area of the client, who could be on versatility now and again and may require home administrations at various areas if an enrolled client changes his area and necessities benefit, he needs to Enlist and determine his new area. The disadvantages in the current framework have been overwhelmed by executing GPS (Global Positioning System) administration.

The algorithm used in this solution:

```

Step 1: =
if(idGpsEnabled)
{
    locationManager.GPS_PROVIDER
}
else
{
    No Location Data Available
}
Step 2:
LocationListener listener = new UserLocationListener();
if(current_location != null)
{
    latitude=current_location.getLatitude();
    longitude=current_location.getLongitude();
    sendData(logged_user, (latitude), (longitude));
}
else
{
    No Stored Location Available
}

```

Figure 5: Algorithm to fetch latitude and longitude

The calculation to think about scope and longitude of User and Service Provider

1. Fetch the scope and longitude of the client Step
2. Store it on the server database Step
3. Compare the scope and longitude of the client and the specialist organization by utilizing the good ways from () technique

4. Allot a specialist organization dependent on the correlation made

We overcome these flaws by using these strategies, here user does not know the exact time how much time will be required to work to come, and we can integrate the map with the current location of a worker. Users cannot see the profile of workers and their previous records. We will prefer to use Android studio as a development tool and SQLite as database storage. The major drawback of this application is that it does not send the confirmation email to the user that their request has been successfully registered and they will get back as soon as possible. We will send a confirmation email to the user. No thank you screen or message will be displayed in this project. We will make the Thank you message after order. No special bonus for the regular customer shall be provided; we will make the bonus for the user who utilizes our services 20 times in a week.

E-commerce Smartphone Application

This paper gives another perspective on such usages that can be availed. It portrays and examines gadget prerequisites, gives a writing survey of essential parts of cell phones that can utilize such applications and the necessities of sites intended for M business. The outline and security parts of cell phones are likewise explored. As another option to existing m-business applications, this paper also explores the qualities and capabilities of the Phone Gap cross versatile stage application. [4]

This review researches the open entryways made through mobile phone access to the Internet. Speedier remote frameworks organization principles grant remote contraptions to use more internet business applications, and thus, allow progressively broad access to compact exchange (m-business) [5]. M-trade has been characterized as "an extraordinary branch of web-based business, in which cell phones furthermore, their framework affiliation medium is used to buy, offer, and advance items, administrations, and information.

This paper will likewise examine the necessities of internet business applications and why ordinary sites are not reasonable for cell phones. Particularly this paper will investigate the qualities required for sites with the goal that they work appropriately on cell phones. At last, the paper plays a role to give answers for portable application improvement and make proposals for future headings.

The following diagram indicates how the application engineering utilizes the Spree web server and a local versatile application utilizing Phone Gap which permits a similar application to keep running in various portable working

frameworks. This compares with the webserver which utilizes web administrations to acquire information.

The architecture Diagram of the mentioned application is given below:

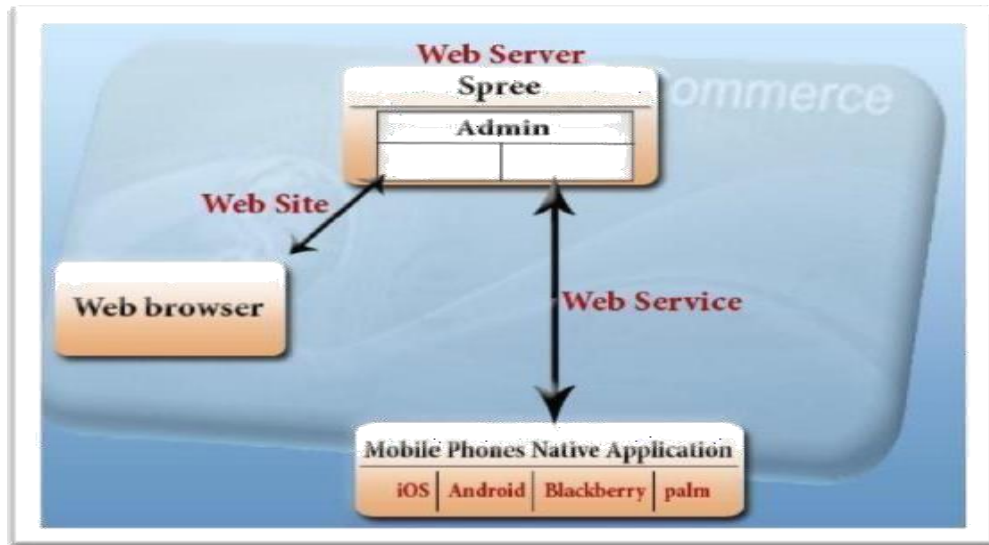


Figure 6: Application Architecture

Research and android Application Development in Android Platform

In recent years as the rise of advanced cell phones has revolutionized the technological industry. The telephone is no longer only a specialized instrument, but also a basic model for the general population's correspondence and everyday life. Various applications incorporate unfathomable redirection for people's lives. The destiny of the framework will be the compact terminal.

Now the Android platform in the electronics market is becoming more and more popular, especially in the Smartphone market. Because it is open-source, some of the development tools are free, so it has plenty of applications. This fact greatly inspired people to use the android system. As smartphones and the android system are getting well known, the activities like tuning in to music, watching recordings, tweeting, and some others can be moved from the PC to a telephone now.[6] Android Architecture includes the Android system which is a Linux based system and shown in Figure.

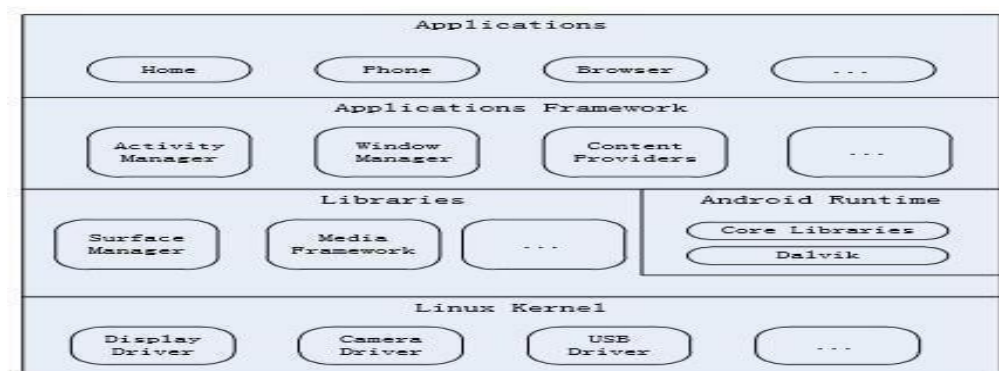


Figure 7: Architecture of Shop Application

It contains layers. ADT and Eclipse are adopted as development tools.

The Gender division of labor

This article is about women's work moving into the paid market on the general sexual orientation isolation of work and consequently on the changing idea of sex imbalance. The section of a more noteworthy number of ladies into the work power happened as family unit administrations, items, and innovation diminished ladies' housework commitments and expanded the interest for female workers in the market.[7]

Virtual Handyman

VIRTUAL HANDYMAN exhibits how arranged detecting, remote systems, and the Web forums benefit together to help in making another class of administrations, i.e., smaller-scale benefits on tap, through in the nick of time individual communications. In particular, it has outdated sensors like remote cameras to empower the remote specialist co-op to specifically observe the setting in which the client is completing a task. Thus, the client doesn't have to invest much energy in portraying the circumstance. Organizations are found dynamically by using the Web organizations establishment (for example UDDI) and are passed on this over the Internet. In doing such, the framework offers the buyer more accommodation, lower cost, strengthening, and better general involvement. Meanwhile, it gives associations, for instance, retailers another decision to brace relationship with their customers, and improve their essential worries through additional salary streams: [8]

Virtual handyman concentrates on home change assignments, the approach can be summed up to other administration regions like cooking, form, individual security, travel, shopping, etc., where individual collaborations between a beginner and a specialist are required.

Take individual design, for instance. With a keen look at your room, whenever you require counsel on what to wear, your closet can, continuously, find and interface you to a live design consultant, who may help you select the best outfit for your particular event. Since the design guide can perceive what you're wearing through the implicit camera, and what you have in the closet through the inserted RFID, you don't have to squander whenever clarifying or portraying them. The administration is quick, individual, and can be called upon at whatever time you feel suitable.

Table 1: indicating names and main features

		Features		
Sr.#	Name	Desktop	IOS	Android
1.	Development of Handy Mobile Application			
2.	Development of new shop application	x	x	
3.	Domestic Android Application for home services	x	x	
4.	E-Commerce Application			
5.	Research and android application development using android platform	x	x	
6.	Gender Division of labor	x	x	x
7.	Virtual Handyman		x	x

Details

RECOMMENDATIONS FOR WEB AND MOBILE APPLICATIONS

The details of related websites are given below

Sukoon

It is a web-based application that allows the user to resolve the household queries online. This website gives a special discount if the request is based upon some other member recommendation. Currently, this website is providing household services like Electrician, Carpenter, Plumber, Ac Repairman, Mason, and Painter.

Prices of sukoon.pk are way much too high. Payment is given to the handyman after the job is done instead of paying online. It is a web-based application; they don't have any android application. Most of the time the website is under maintenance and users are unable to place their order. This website currently operating in Karachi only. The website does not show the number of employed workers available in a specific period. Do not have any android application, for the ease of people having smartphones.[8]

Mazdoor Online

This website provides a solution to the users who have queries regarding household issues. This website allows users to contact them directly through mobile number instead of making an account. It is simple and easy to use. Users of this website are provided with services like Carpenter, Electrician, Plumber, Painter, Construction, and Interior/Office.

This website does not have online ordering functionality; the user needs to make a call on a specific Mobile number shown on the website. If the user wants to take information, by making the call they are spending their money before the order. This website is currently operating in Karachi only. It does not provide the rating system by which we cannot evaluate the performance of handyman. Also, it does not have an android application, for the ease of people using smartphones. [9]

Frienso

It provides a shopping cart facility to place multiple orders. Moreover, the categories are subdivided into multiple subcategories. The prices are automatically discounted as order quantity increases. Provide verified/certified handymen for services. Online orders are cross verified using OTP on a mobile phone. The website is currently developing and is not completed yet. It looks like it is developed by one or two persons hence not reliable. In case of any query, there is no such proper organization to register complaints. Design is based on a Single Page Application (SPA). Prices are way too high now they are just requesting the email, while no further reactions are conveyed or even told by email. They do not have any android application, for the ease of people using smartphones. [10]

Bolee

This website is a classified ads website. Different ads related to Motors, Property, Education, Services, and Jobs are available on their website. Users can access and get benefits from this website all over in Pakistan.

Too many categories require too much information hence there is ambiguity for users. Along with that, there is no feedback is available. The domain name is also not related to the services they are providing to the customers. There is too much backlinking on their website. They do not have any android application, for the ease of people using smartphones. [11]

The Handyman

They claim to have professional and trained technicians. They can do both commercial and household services. A tool-free helpline number is available in case of any query. It is the private limited company providing such services. This website is currently working in Islamabad only. Do not have any android application, for the ease of people using smartphones. [12]

Mr. Handyman

Mr. Handyman provides Professional Handyman Services with trust. Their motto is “We arrive on time in uniform and a marked van with the tools to complete the job right”. They provide residential services as well as commercial services to their clients. Some of their services include Assembly, Repair, Carpentry, Drywall Installation, Tile Exterior, Painting, and Maintenance. Also, for commercial jobs feedback is available of workers

Android app does not exist for this website and the employee registration is also not available. There are too many things on the front page hence layman has more difficulty requesting any services. [13]

Thumbtack

This website provides the functions to their users like Assembly, Repair, Carpentry, Drywall, Installation,

Tile, Exterior, Painting, Maintenance, and Commercial.

Feedback is not available for workers. Also, the android application does not exist. This website is taking too much information from the user in his first visit to the site. There is no special bonus is available. [14]

Kivi Movers

They specialize in finding solutions to problems in an affordable, efficient manner. They are trusted by many reputable organizations. To get the free estimate the customers have to call them at 020 8877 9682. They claim that the customer can still get a friendly and reliable service depending upon the budget of the customer. Kivi Movers provides its users with services like Property maintenance, Removal assistance, Furniture assembly, and dismantling along with painting and decorating.

As critical analysis is concerned, we have a big issue using this website that it does not have Android application for the ease of user having smartphones. And the Feedback is not available for new users.

Services of this website are available in London only. You cannot take information about your required work until you cannot call them. [15]

Hitches Glitches

They provide their clients with Reliable, Trusted, and Professional Handyman Services. They have plenty of services that cover a wide range of repairs and home maintenance and trends to provide a one-call solution to their clients. Hitches glitches provide the services which include repair/ replacement services including that of a door, window, and any appliance installation. They also hire handyman online and provide painting services also to their clients. Hitches glitches users can entertain with their front end because it's simple and easy to use. Android does not exist, it has limited functionality and it does not contain

any feedback system, and the major flaw of this web is that many ads on it which are very irritating for most of the user. And it does not give a special bonus to anyone. [16]

Home Maintenance Company

Home Maintenance Company is one of the successful start-ups in India with a complete home maintenance solution for everything which a person needs in a house under one roof. They claim to have the most reliable and trusted handyman at an affordable price. HMC is responsible for providing their customer with household services which include all kinds of repair like washing machines, refrigerators, and AC repair services. They also provide people with Electricians, plumbers, and carpenters to solve their household problems. This service is only for Indian and Pakistani cannot entertain from this service. Feedback is not available of workers Reference option does not exist. Moreover, special offer on occasion does not exist. And they do not have any android application. [17] **Table 2:** Comparison of the table with different websites

Details		Websites Features									
Sr. #	Name	Price Estimate	Shopping Cart	Review of job	Online Payment	Advance Booking	CSR chat	Integrated shop for tools	Easy Interface	Rate handyman	Android App
1.	Sukoon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
2.	Mazdoor Online		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
3.	Frienso			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>
4.	Bolee	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	The Handyman		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
6.	Mr.	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>

	Handyman										
7.	Thumbtack	<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	Kiwi Movers	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
9.	Hitches Gitches	<input type="checkbox"/>				<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	Home Maintenance Company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Above table demonstrate and compare related work happened in different ways with some limitations so by aboveStats, we implemented android application as one whole solution by considering with the addition above Mentioned limitations

HANDYMAN SERVICES WEBSITE

Handyman Services website is developed using ASP.NET and Microsoft SQL Server. The system is basedon the layered architecture where a total of four layers (Models, Data Access Layer i.e. DAL, Services, Handyman Project) communicate with each other. The medium of database which is responsible for insertion, deletion, updating, and viewing data is done using stored procedures, functions, and triggers. While considering the overall functionality of the project, the followings are the users that may affect theresulting output of the system from their perspective.

Table 3: User perspective

Users	Level of Computer Knowledge		Level of Business Knowledge	Frequency of usage
Admins	Extensive	knowledge of Website management.	The understanding flow ofbusiness Management system.	Order Processing for every New order.
	Have used		They could use the help in theform of instructions provided by Admin	
Customer	Applications before.	window based		Depends upon the when Want to do the job done.

Database	Database handling skills for	The understanding flow of business	Frequently
Administrator	Microsoft SQL Server.	Management system.	

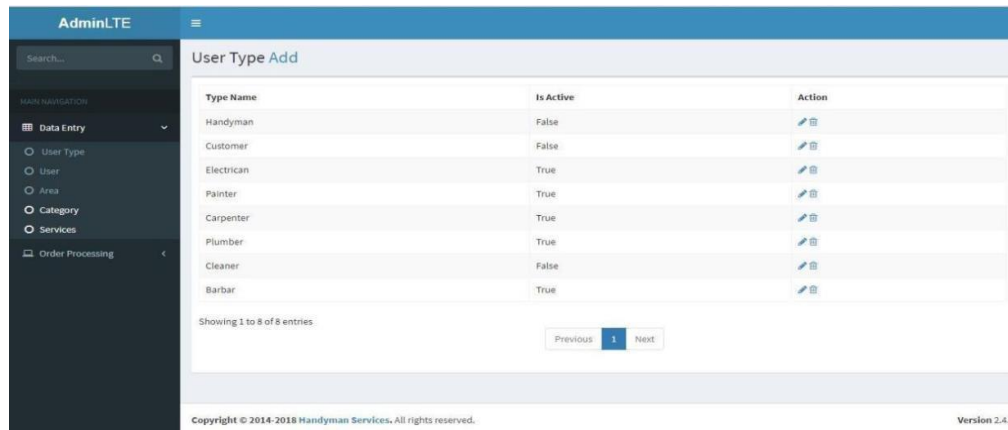
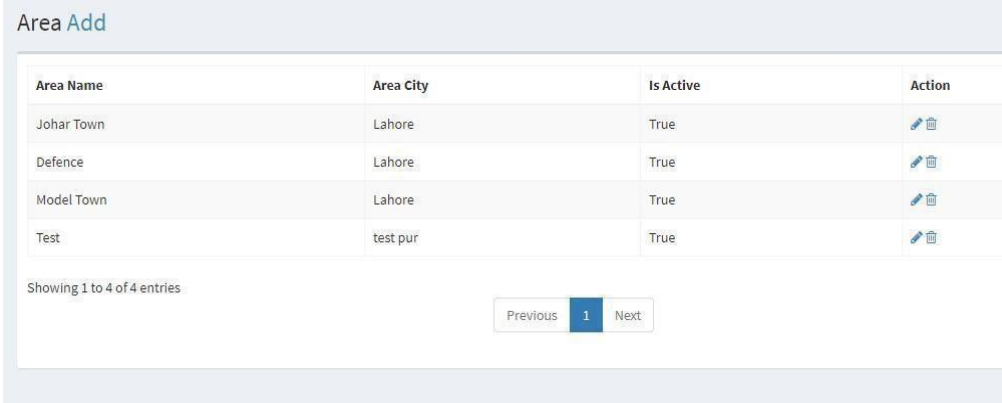










Figure 1: Admin adding handyman type

Similarly, the admin can add categories and then add services concerning those categories based on the same criteria mentioned above. The system enables the admin to add the handyman type to identify whether he is electrician, plumber, painter, carpenter, cleaner, etc. The system makes the admin select a checkbox or not while adding a new handyman. This selection will allow us to track whether the handyman is currently serving or not. Handyman Admin panel allows the admin to just enable and disable the handyman type without deleting from the database. Handyman Admin panel allows the admin to just enable and disable the handyman type without deleting from the database. Admin has the capability for editing the type name if there are any typing errors. Admin should easily edit the status of the handyman type already available in the database either it is enabled or disabled. Handyman Services do not allow the admin to delete the handyman type he added or those which already exist in the database. When admin clicks the cancel button, the system redirects admin to the search page where all the records for handyman type will be displayed in tabular form. To reduce the application size and response time, both edit and add operations are done on the same page. Handyman services admin panel displays the records of handyman type with the pagination so that the record display, maintenance will be neat and easy.

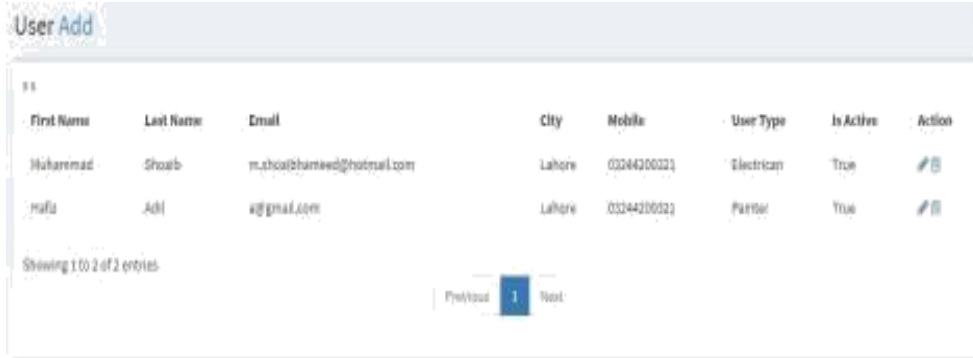


The screenshot shows a web interface titled "Area Add". It contains a table with the following data:





Area Name	Area City	Is Active	Action
Johar Town	Lahore	True	 
Defence	Lahore	True	 
Model Town	Lahore	True	 
Test	test pur	True	 

Below the table, it says "Showing 1 to 4 of 4 entries". At the bottom, there are navigation buttons: "Previous", "1" (highlighted), and "Next".

Figure 2: Handyman adding to system



The screenshot shows a web interface titled "User Add". It contains a table with the following data:

First Name	Last Name	Email	City	Mobile	User Type	Is Active	Action
Muhammad	Shoab	m.shoab@hameed@hotmail.com	Lahore	0324420021	Electrician	True	 
Yasir	Adil	yadil@gmail.com	Lahore	0324420021	Painter	True	 

Below the table, it says "Showing 1 to 2 of 2 entries". At the bottom, there are navigation buttons: "Previous", "1" (highlighted), and "Next".

Figure 3: Area where services will be provided

ANDROID HANDYMAN APPLICATION

Keeping in view all the problems and omission faced in research and development work we decided to overcome these issues by developing an android application that will facilitate in handyman services. This application provides the interface to customer hiring, Electrician, Plumber, Carpenter, Cleaner, Painter. It contains two boards, Customer or Client board that is on the android stage, while another board that is an executive board that is on Web Technology. Parts of Android panel contains, searching the area, selection of specific service, calculation of the amount, authentication system through REST API's that is in PHP Language, Recovery of password if forgotten, sign in through Social media (Face book), splash Screen, Intro Slider, Multi-Language System, etc.

We use Android Studio 2.2.3 for the development of android handyman Application, MySQL Server for data communication, SQL Lite database for storing Suggestion of area names.

USE CASE MODEL

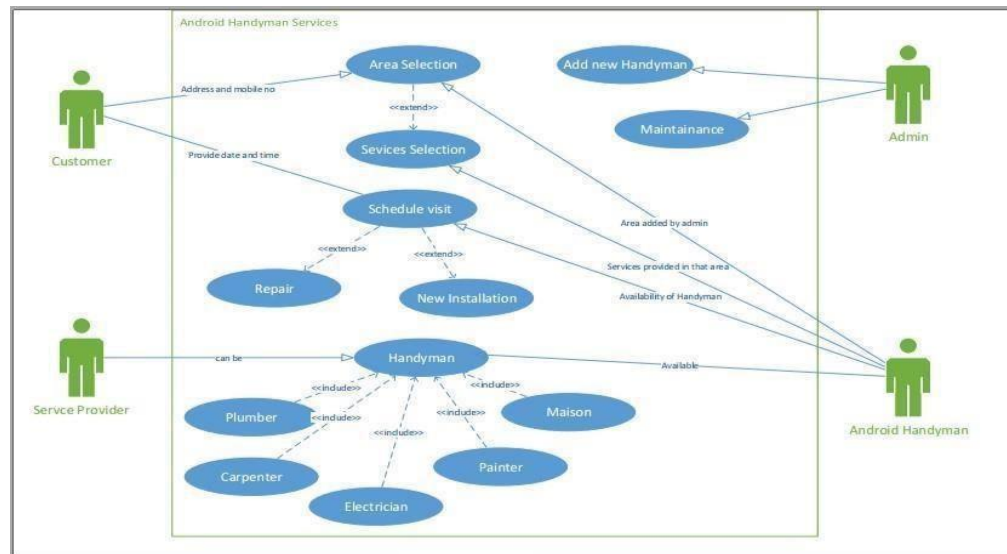


Figure 11: Use Case Models

This use case diagram tells the how android handyman application are working, we have four actors in it, Customer, Service Provider, Admin, Android handyman, and the role of them are mentioned above. We are providing services in specific areas for now. Also, giving the interface to the client to look through their territory where they need assistance when they type, the proposal will be stacked from MySQL utilizing REST APIs.

The User Interface of android Application is given below.

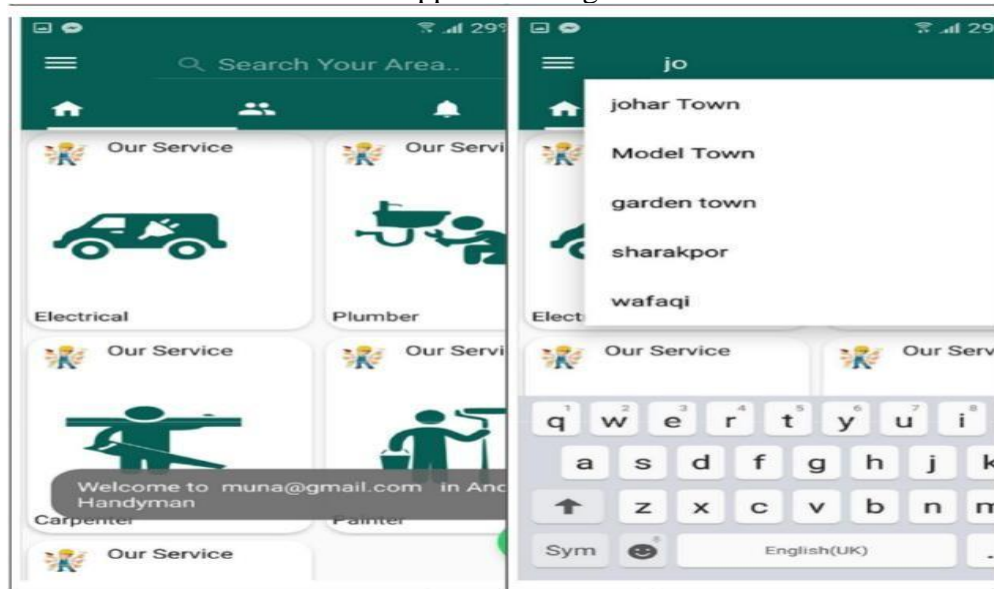


Figure 12: Customer panel of application

So, it's a location-based search for Services. For Instance, In Johor Town Lahore Pakistan, we are providing two services, Electrician and Plumber, so you can see that in the images. After putting a request, the client will get a message

from Administrator your request has been handling, it implies the client gets a warning, your question has been submitted and inside 15 min a service provider contacts you and fulfill your service. As we discussed above, we have overcome the issue of Multilanguage's which is a big problem in the currently running applications. A layman doesn't know about English and they are facing a big problem to place order and usage of the application. So here are attached images of our application As images describe how an android handyman application overcome the issue of languages. Here we need to go to the navigation drawer and click on settings-> select one language at a time, then refresh it by sliding the finger top to bottom and all app converted into the desired language

CONCLUSION

This can be extended as the future work in many dimensions, including since this system can make a business so we can expand this system by incorporating eCommerce i.e. integrated shops. Also, a prioritized listing of handymen can be shown upon user search which may have a nominal fee. CRM (customer relationship management) can be integrated within the application for better client interaction and issue management. Moreover, as the user base grows paid advertisements can be placed upon several sections for monetization purposes. In terms of user collaboration and discussion platforms, blogs and forums can be integrated. Finally, since the data itself is valuable, we can use collected data to elicit statistics to target our marketing campaigns to achieve better result

REFERENCE

- A. Oluwatoyin, S. Adeshina and R. Akingbade, [Online] Available: "Development of a Handyman Mobile," International Journal of Computer Science Engineering (IJCSE), vol. Vol. 4 No.06 Nov 2015, no. 2319-7323, pp. 6-7
- S. Samal and S. P. Jena, "Research on the Development of a New Shop Application Using Android," International Journal of Advanced Computer Research, Vols. Volume-4 Number-1 Issue-14 March- 2014, no. 2277-7970, pp. 12-15.
- S. Bandekar and A. D'Silva, "Domestic Android Application for Home Services," International Journal of Computer Applications (0975 – 8887), Vols. Volume 148 – No.6, August 2016, pp. 13-15.
- A.S.Alqahtani and R.Goodwin, "E-commerce Smartphone Application," (IJACSA) International Journal of Advanced Computer Science and Applications, Vols. Vol. 3, No.8, 2012, pp. 12-17.
- L. Ma, L. Gui and J. Wang, "Research and Development of Mobile Application," International Journal of Multimedia and Ubiquitous Engineering, Vols. Vol.9, No.4(2014), pp. 187-198.
- Weinberg, K. E. (2015). How women experience gender when working with men in a female-concentrated occupation (Doctoral dissertation, Fielding Graduate University).
- Wan, D. VIRTUAL HANDYMAN: Supporting Micro Services on Tap through Situated Sensing & Web Services. In Supplemental Proceedings of ACM 2002 Conference on Computer Supported Cooperative Work CSCW (Vol. 2, pp. 16-20).
- F. Khan "Services delivered at home," sakoon.com

- <https://tribune.com.pk/story/879434/services-delivered-at-home-blue-collared-jobs-now-go-online> [Accessed 04 03 2017].
- “Online plumbers in Pakistan,” <http://mazdooronline.pk/> [Accessed 11 03 2017].
- “Frienso,” [Online]. Available: <http://frienso.pk/>. [Accessed 04 03 2017].
- “Plumber-Electrician Pakistan,” [Online]. Available: <http://bolee.com/plumbers-electricians-nid-259>. [Accessed 04 03 2017].
- “Electricians, Plumbers, AC Technicians,” [Online]. Available: <http://www.thehandyman.com.pk/>. [Accessed 04 03 2017].
- “Mr. Handyman,” [Online]. Available: <https://www.mrhandyman.com/>. [Accessed 06 03 2017].
- “Thumbtack,” [Online] Available: <https://www.thumbtack.com/>. [Accessed 06 03 2017].
- “Kiwi Movers,” [Online]. Available: <https://www.kiwimovers.co.uk/>. [Accessed 06 03 2017].
- “Hitches & Glitches,” [Online]. Available: <http://www.hitchesglitches.com/>. [Accessed 06 03 2017].