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MyHome-An Android Application for Managing Home construction

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Abstract: An own house is a dream of many people. But when it comes to planning and construction of a house or building the challenges and troubles that we need to encounter are many. Which includes lack of trustworthy contractors, unavailability of laborers, unavailability of affordable and experienced architects or engineers, etc. If the owner is abroad or out of state the problem even worsens. Most of the people abroad normally assigned a contractor for the whole construction. But whether the contractors are trustworthy or not, we don't know! Many contractors quote very high and compromise the quality of raw materials. The construction of a home is a complex process. And that is where this application has come into the picture. This application includes everything for the construction of a building. From planning to flooring and painting, everything for the construction and accomplishment of a building is included. The customer can handle everything online. If the customer is abroad or out of state they can take part in each step of the construction like the selection of workers, engineers, materials online. Through this app, we aim to provide trustworthy, affordable, and hardworking employees and also help us to build our home without any complexities and delays. Customers can find all kinds of laborers that are needed for construction in this application. Any individual with some funds and this application can build their home without any complexities and with comfort.

Index Terms **– Android App, Home Construction.**

1.INTRODUCTION

As time goes on, we are in a haunt for an easy and affordable way of living. Most of us are highly dependent on a variety of applications in our daily routine to save our time, energy, and money. In this era, we are very much bonded with technology because it makes everything easier. Technology has made drastic changes in every sector. One of the main contributions of technology is the development of personalized applications. There are thousands of applications out there to make our job easier and perfect. But only a few of them are available in the construction field.

Assigning workers for the construction of buildings is a task that requires a lot of patience. As we all know the availability of certain workers, their wages and all concerns us the most during the construction. So, to overcome all these kinds of difficulties and hardships we designed our application "my Home" which provides all workers and raw materials required for the construction. We are introducing a way to make this easier through an application. Our project is an application that will help us to knit all the difficult processes in the construction of a building. It will bind all the stages together from engineers, contractors, subcontractors, electricians, and even interior designers. We make everything easier and anyone with capital and this app can build their own home without complications and by comfort. This application aims to provide all workers required for the construction of a building. From architects or civil engineers to even interior designers are included in this application. The customers can find any kind of worker from this app. The workers or clients may back off from work after confirming the work. So to prevent this we make sure to sign a contract between the client and worker before the work starts. And after confirming the work if the worker skips the work frequently without any solid reason, the client can report it and we deduct a fine charge from the worker. This application provides a platform for workers to find jobs convenient for them and clients can assign their construction work to trustworthy workers.

2.LITERATURE REVIEW

MyHome is an application for the construction of buildings that will have a lot to do in the current scenario. This application helps individuals to build their homes without any complexities. In this pandemic situation, there is a lot of hindrance for building homes or buildings. Like physical interactions between the clients and workers, monitoring the works, contacting the engineers that clients needed to give the works, etc. The existing method for all these is the traditional way of building a home which needs more effort and money. By implementing an application for construction management can give lots of advantages to our society. For this, we collected a list of workers who are working in the construction field and studied various problems faced by them. The studies regarding the needs of workers and the difficulties faced by the workers are many. The study gives us the idea of how to design our application to make it user-friendly and how to make use of details of workers for selecting them as the workers for the

clients using this application. For this secondary data has been collected. From the workers like Plumbers, Electricians, Carpenters, Interior designers and such workers working in the same field. we also collected data from engineers and clients (who need to build). Data like their names, locations, previous works, Photo (identity proofs) are collected from the workers, and data like basic identity information are collected from the clients. And we studied various needs and behavior of clients. We also made a literature survey that deals with literature that explains the main aspects and causes of delays and obstacles while constructing a building.

Prof.B.V.Birajdar etl[1] introduced the causes of delay in building construction projects. Delay in Building Construction projects is one of the most common problems. Delay can be defined as time overrun or extension of time to complete the project. Delay is a situation when the actual progress of a construction project is slower than the planned schedule or late completion of the projects. Construction industries are a growing industry all over the world. In Nigeria, Time and cost overruns have been identified as the most important factors responsible for abandonment and contractor failure (Elinwa and Uba 2001). Although the Indian industry has gained far more importance in recent because of the opening up of Indian markets and the arrival of megaprojects for infrastructure development, the performance of Indian construction projects. A study conducted by the Infrastructure and Project Monitoring Division of Ministry of Statistics and Programme Implementation (http://www.mospi.nic.in) Reports that out of 646 central sector projects (which are of the order of more than $4.45 million) Costing around $50trillion and average project duration of 6 to 7 years, about 40% are behind schedule and the delay ranges from 1 to 252 months. The schedule overrun in percentage terms as of December 2003 was reported to be 40.23% while the figure for the same as on December 2004 was reported to be 39.9%.(K.C.Iyer and K.N.Jha 2006). Delay gives increase to disturbance of work and loss of productivity, late completion of the project increased time-related costs, and third-party claims and abandonment or termination of the contract.

General management must keep track of progress to reduce the possibility of delay occurrence or identify it at early stages (Saleh Al Hadi Tumi 2009[2]). Delays are insidious often resulting in time overrun, disputes, litigation, and complete abandonment of projects (Sambasivan and Soon,2007[3]). Many projects are such a nature that the client will suffer hardship, expense, or loss of revenue if the work is delayed beyond the time specified in the contract (clough, 1986). Frank D.K.Fugar and Adwoa B.Agyakwah-Baah (2010) [4] studied the "Delays in Building construction projects in Ghana". The study sought the relative importance of the factors that cause delays in building construction projects in Ghana, from that study showed that all the three groups of respondents generally agreed that out of a total of 32 factors the top ten influencing factors in causing delay arranged in deseeding order of importance are:1)Delay in honoring certificates.2) Underestimation of the costs of projects.3) Underestimation of the complexity of the project.4)Difficulty in accessing bank credit.5) Poor supervision.6)underestimation of time for completion of projects by contractors.7)Shortage of materials 8) Poor professional management.9) Fluctuations of prices/rising cost of materials.10) Poor site management.] In this study, 32 factors were categorized into nine major groups and were ranked. The result shows that clients, consultants, and contractors all agreed that the financing group of delay factors was the most influential factor. Material factors were considered the second most important factor causing a delay in construction projects followed by scheduling and controlling factors and suggested some remedies for the delay.

Ghada M Gad and Jennifer Shain [5] introduced a literature review on trust in the construction industry. While the tremendous focus in management research is placed on new construction technologies, the social and human factors through which these technologies are implemented are often neglected. An increasing trend in construction management research is seen in soft management aspects such as trust. This developed from the fact that construction projects involve individuals and their beliefs. Construction projects are based on collaboration among contracting parties to accomplish project goals. Thus, it is crucial to quickly build teams and establish good communications between team members. Trust has been determined by many studies as an excellent determinant to successful projects and crucial to building integrated project teams. This paper aims to present a literature review of research on trust in construction, identify knowledge gaps, and suggest recommendations for future research. More than 50 peer-reviewed publications were reviewed through which six main lines of research were identified. Research in trust in construction seems to primarily focus on four main areas; trust types, factors affecting trust development, trust effect on project success, and relational contracting, yet there still exists a knowledge gap in areas of non-relational agreements, North American construction markets, and project cost, risk, and contracts' relations.

3.IMPLEMENTATION

MyHome is an application for managing home construction. Every interaction between clients and workers can be done through this application because it binds all the complex process included in building the home and make the job more manageable. It acts as a mediator between Clients (The one who need to build their home) and the workers (who works in the construction field like engineers, contractors, etc.) and completes the works without physical interactions between them (clients and workers) and within the time (specified by the clients). For the development of this application, various tools like Android studio, PyCharm, Python 3.7.1, Sqlyog, wamp, MySQL are used. This project is completed as a combination of both Android and web applications. Our project consists of five modules. They are,

- Client
- Admin
- Worker
- Contractor
- Engineer

The client module is an Android application build using Android Studio. And the other four modules are web applications build using PyCharm editor

3.1 WEB APPLICATION

3.1.1. Admin: admin can log in using their credentials. Admin can add and view categories (workers, contractors, engineers). They can select or view engineers, contractors, workers and they can view the appointments between the clients and workers. The view appointment function shows every detail between the user and the worker to the admin. Admin mainly creates the work agreement (agreement between client and worker after accepting the work request) and uploads it for the worker and the worker downloads the agreement. The admin module is build using PyCharm and if the admin wants to clear the database of workers, engineers, and contractors, they can simply delete them from their log-in page.

3.1.2. Contractors: They can sign up using the browser on this page or if they are new, they can sign up by submitting their basic identity details. After logging in they can see their profile and they can update the details if needed. They can also get information about their current work status, pending work requests, and fine details (contractors must pay a fine if they did not complete the work within the specified time).

3.1.3. Workers: The worker can reject or approve a request from the client. After logging in workers can see the status of each request from the clients. Any individual knowing the works related to the construction can register as a worker with their identity proof. Which helps them to find job easier. The fine calculation is done when the worker exceeds the allowed time (The allowed time will be mentioned by the client when sending a request to the workers).

Fine Calculation: Fine is calculated when the workers did not complete the work within the date specified by the client. That is if the workers did not update as completed work on their account before the date specified by the client, then a hundred rupee multiplied with the day exceeded must be paid by the workers as fine. (For example-If the last date to complete the work is 2/2/2021 and the worker completes the work only after five days from the deadline that is on 7/2/2021. Then a fine of 100*5=500/- must be paid by the workers).

3.1.5. Engineers: Engineers can also log in using their credentials and view their profiles. Also, view the requests got from the clients. They can upload or download the agreement which was uploaded by the admin. They can chat and contact the clients to get a clear picture of the client's needs.

3.2 Android Application

3.2.1. Clients (One who needs workers): The client module is build using Android studio. This is a fully database-oriented application. Clients can log in using their credentials after registering with their details. They can see the workers available and can request work. They can also check the status of the request. In addition to local workers, they can see engineers', contractors' details through the application and can request work. They can chat and contact the engineers to share the details about their buildings. Clients can also search for any workers using the search bar available. When the corresponding worker accepts the request from the client then accepted status will be shown on the client's side. After that, the admin uploads an agreement including the date specified by the client, and the workers can download the agreement if they agree to work as per the client's request.

Clients can also view the fine details if any workers failed to complete the work within the specified time. The client can see the workers according to their locations. Every detail that a client needs to know about the workers is shown and can directly give them the work which is the main objective of this application. Irrespective of the engineer's location clients can choose them by looking at their previous works and the price they are normally demanded. In addition to all these features we can add raw materials available through the application (Can be implemented in the future).

3.3 Overall workflow

Before giving access to the clients, several workers, engineers, contractors need to get registered through the browser (web Application). They all can register using their basic details and can wait for the requests from the clients.

3.3.1 Clients to workers

Clients first select the workers from the "view workers" option available on the application after logging in. After giving a request they can view the work requests send from the option (view request status). In the case of work requests to engineers, after request accepting there is an extra option available that helps the clients contact directly with the engineers. Clients can also see whether work is completed or not while examining the work request status.

3.3.2 Workers to clients

After signing in, workers can see the requests from the clients and can accept the request. And complete the work within the specified time by the clients and update as completed. After accepting the request from the clients, they can download the agreement which is uploaded by the admin. Can also view the fine details if any are pending.

4. Results.

4.1 Admin's Login

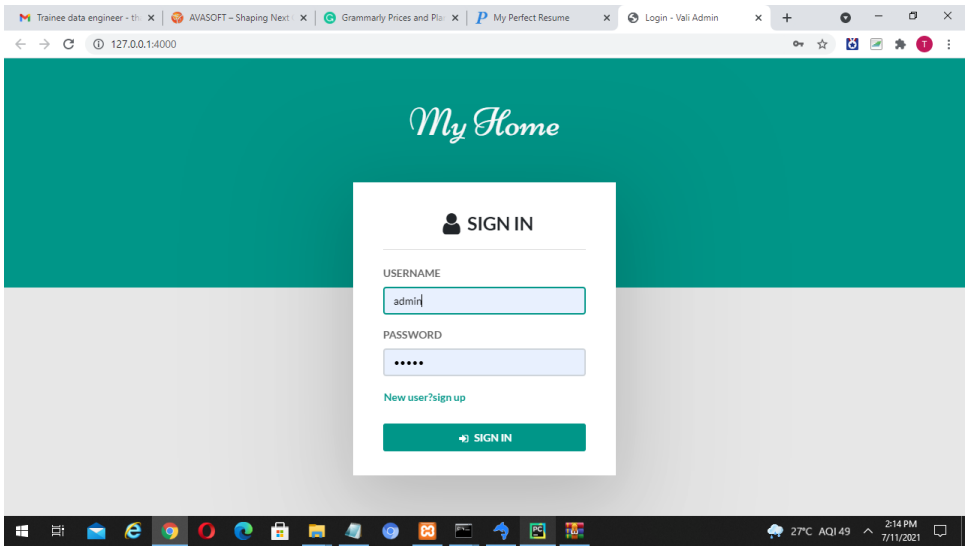

fig:4.1. After running the URL on the browser.Admin's login page.

4.2. workers login page

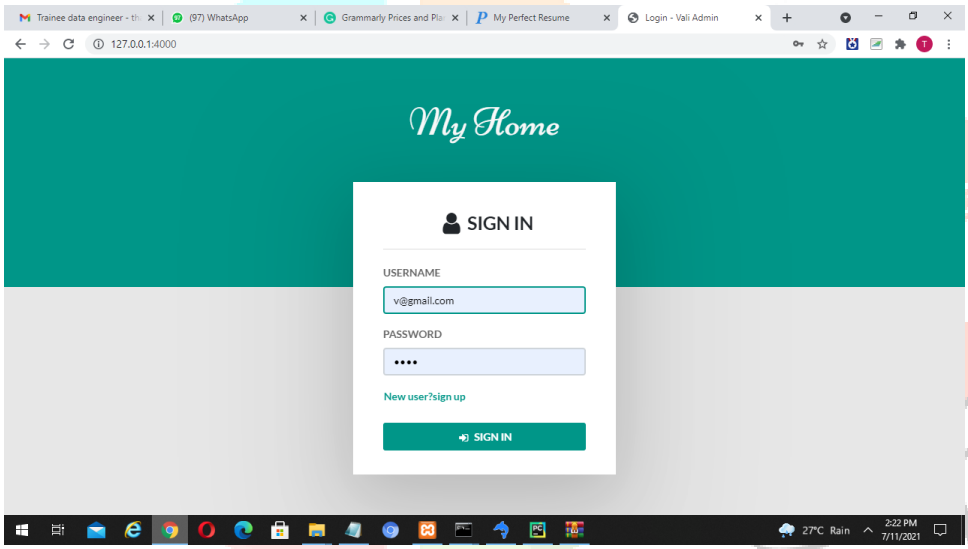

fig:4.2. The same page as admins for logging in as workers.

4.3. Admin's page after logging in

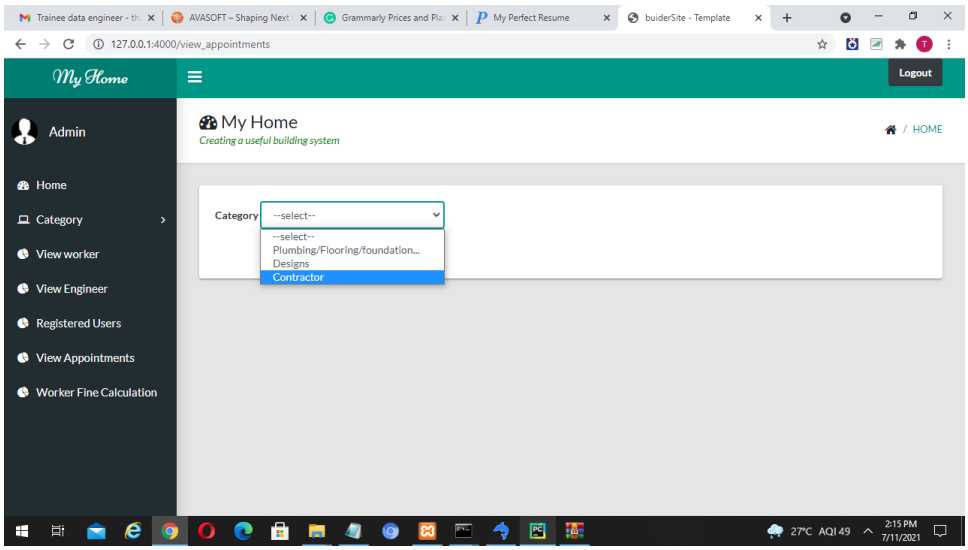

fig.4.3. A page for admin's use.

Figure 4.3 can search the workers from the category options. Other features like view workers, engineers, registered users, and all appointments taking place inside the application and worker's fine calculation can be viewed by the admins.

4.4 Fine calculation (Admin)

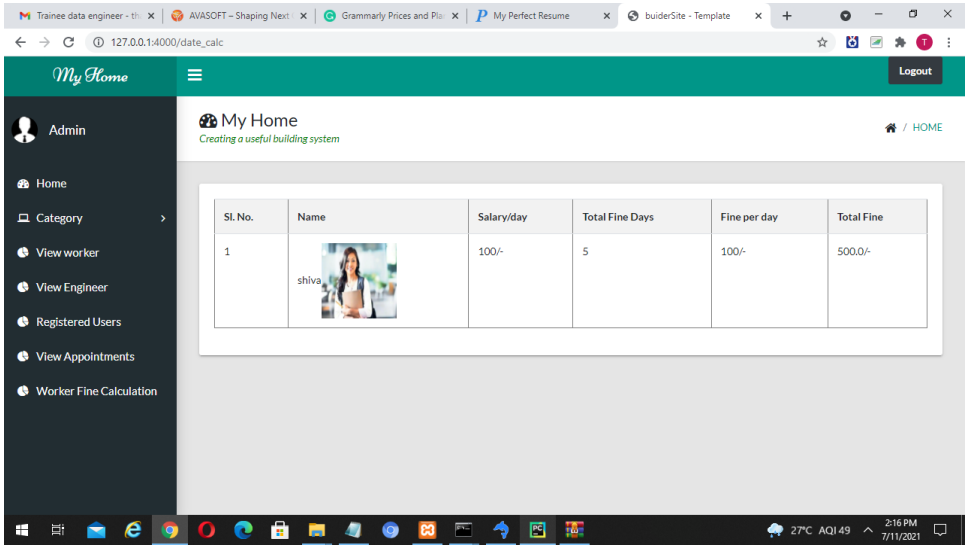

fig.4.4 fine details of a worker

figure 4.4 shows the fine calculation of a worker named Shiva. Here the total number of fine days is five and the fine per day is 100. So in total five hundred rupees only

4.5 Appointment Details

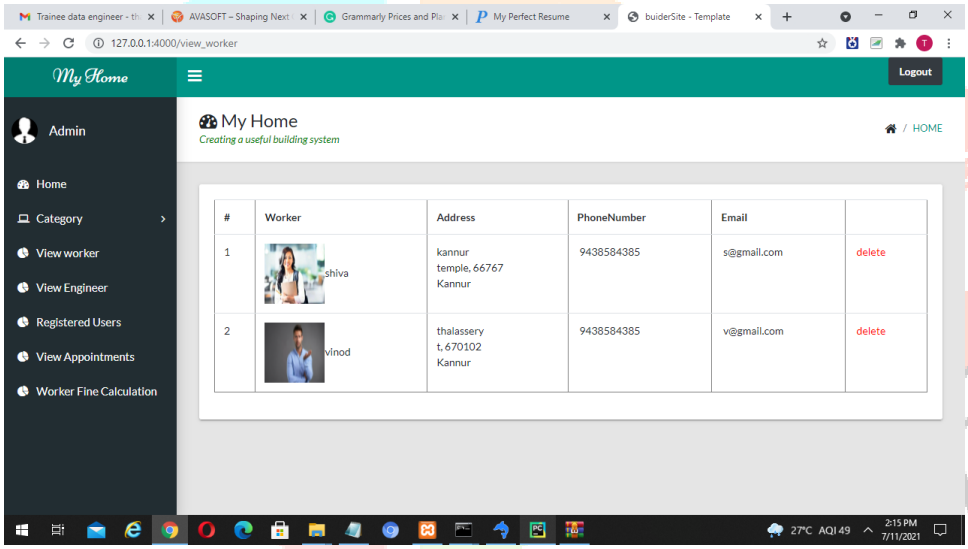

fig 4.5 showing the details of appointments between client and worker

4.6 Workers page (after logging in)

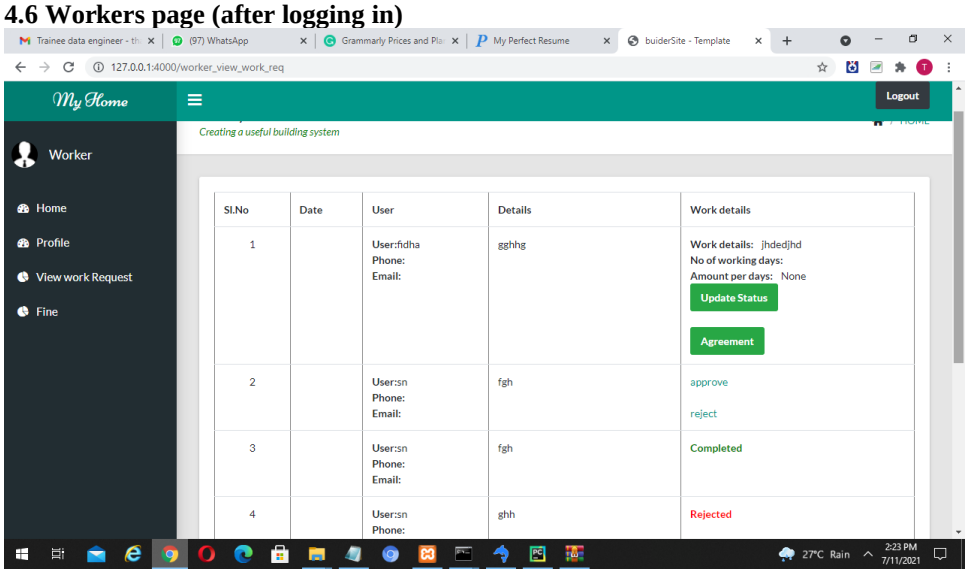

fig 4.6 works logged in details

figure 4.6 shows the page after the workers logged in using their credentials.

4.7 Clients page (After logging in through Android application)

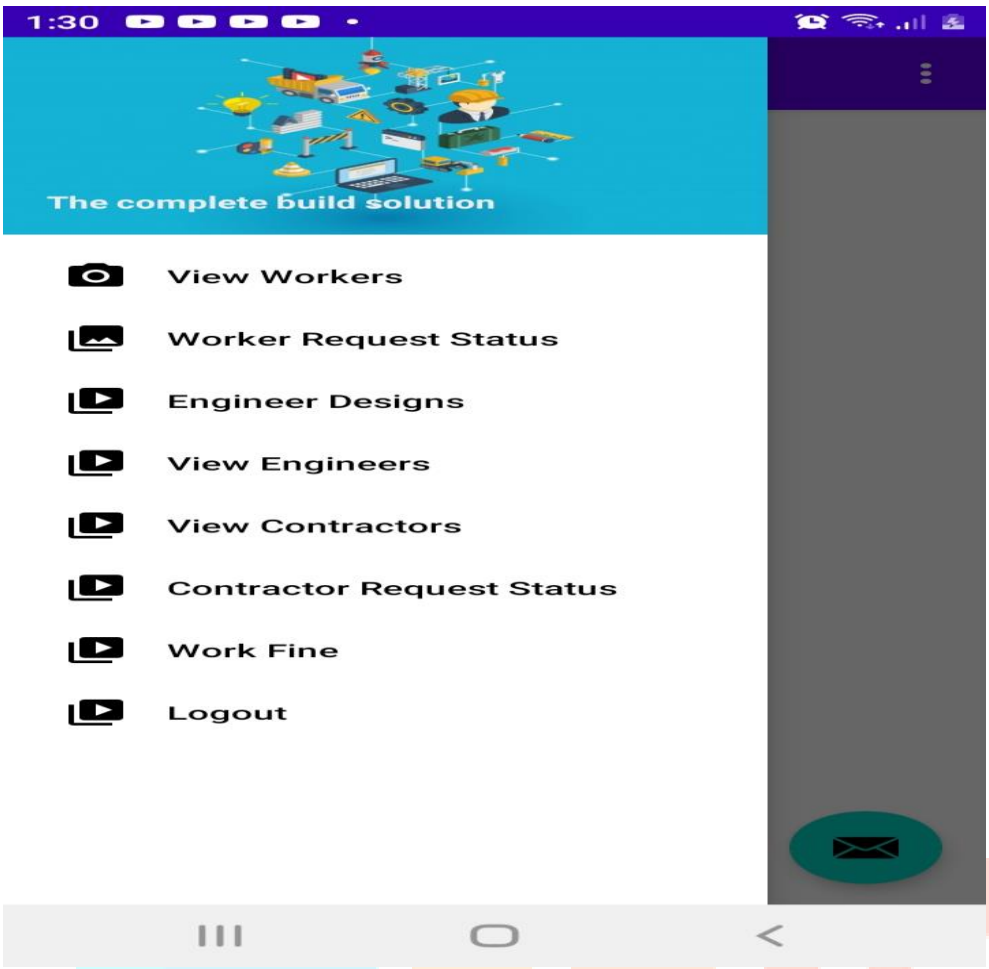

fig.4.7. Showing the clients page after logging in.

figure 4.7 shows the page when the client login inside the Android application. View workers option sown is used to search the workers, engineers, contractors according to client's needs. Worker request status is for looking at whether the worker accepts or rejects the work request. View engineer's functions show the details of available engineers and also have an option of chat if the engineers accept the request from clients. The "View contractors" option is used for viewing the contractor details and for work requests. The "Work fine" option helps to understand which workers need to pay how much amount of the fine.

5.Conclusion

MyHome application has successfully been implemented and it is beneficial in various ways for the people who are suffering from the complex process included in the building construction field. This application helps the clients to choose their workers according to their previous works and also monitor the work. Workers who are facing difficulties to find a job can easily register in this application and can get a job request from the clients. This application will also help for completing the construction on time. It has much scope in such a pandemic condition to reduce physical interaction between the clients and workers.

6. References

[1]Prof.B.V.Birajdar etl, delay in construction projects.A study conducted by the Infrastructure and Project Monitoring Division of Ministry of Statistics and Programme Implementation (http://www.mospi.nic.in).
[2] Saleh Al Hadi Tumi, 2009, progress to reduce the possibility of delay occurrence or identify it at early stages.
[3] Sambasivan and Soon,2007.
[4] Frank D.K.Fugar and Adwoa B.Agyakwah-Baah (2010), Delays in Building construction projects in Ghana.
[5] Ghada M Gad and Jennifer Shain, trust in the construction industry.
"acknowledgment" inAmericaiswithoutan "e" afterthe "g".Avoidthestiltedexpression, "Oneofus(R.B.G.) thanks..." Instead,try"R.B.G.thanks".Putapplicablesponsoracknowledgmentshere;DONOTplacethemonthefirstpageofyourpaperorasafootnote.**[3]** Bhatti, U. and Hanif. M. 2010. Validity of Capital Assets Pricing Model.Evidence from KSE-Pakistan.European Journal of Economics, Finance and Administrative Science, 3 (20).