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TracWork: An On-Field Employee Tracking System

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***Abstract* - The internet has transformed the world into a global village, benefiting our society as a whole and empowering people in a variety of ways. Many mobile applications are becoming a part of people's daily lives and assisting them in their jobs or daily routines, thanks in part to the phenomenal growth of Internet usage over the last 21 years. Previous research has found a scarcity of high-quality apps that cover all bases. This project's primary goals are to combine fragmented market systems into a product capable of performing functions such as tracking an employee's on-field movement using GPS; assisting employees in navigating to their next destination; maintaining and improving productivity levels using indicators such as battery status; current and past location; and so on. We highlight previous work and how we learned to extract a model that harmonises current systems while also improving quality of life in this study. We investigated numerous approaches, methods, and procedures before applying them to the development of the system.**

Keywords— Employee Tracking, Employee Productivity Check, Mobile Application.

I. Introduction

In 1888, William Le Grand Bundy invented a mechanical time recorder that did little more than keep track of the precise moment an employee at his jewelry store signed in for the day. It did not consider whether the employee was using a coworker to punch in on time even if the individual in question was late, nor did it record whether the employee took illegal breaks or engaged in behavior that violated company standards. In the twenty-first century, businesses have access to a plethora of tools that, when used in tandem, have the potential to completely automate the process while also increasing productivity.

Tracking people on the pitch is a difficult issue these days, but it is a critical responsibility for increasing an organization's productivity. Workplace violations and employee misbehavior are common in today's industrialized world, where global corporations and local start-ups alike rely on a strong and adaptable workforce [1]. Even in 2022, finding an Employee Monitoring System other than basic attendance systems that workers can easily manipulate is rare. TracWork's goal is to combine our efforts into a single solution capable of meeting these requirements seamlessly and succeeding where others fail [2].

II. Literature Review

There are a variety of Employee Tracking apps for both Android and iOS that cater to the aforementioned needs to varying degrees:

• Hubstaff [3] pinpoints employee positions at all times using GPS location services and cutting-edge geofencing techniques which also offers the payroll management system within the application. The application is developed in United States and is being used for variety of services like software development, ecommerce, real estate, Agency & Staffing and Recruiting.

• HoursTracker [4] clocks employees in and out of work and allows them to start and end shifts manually. It further classifies entries for ease access and comprehension by day, week, or month. It basically depicts the time employee spent on work in weeks or month.

• TrackQlik, a Lahore-based start-up, provides face, video, and voice authentication for time input to give clients with a more secure, accurate, and comprehensive experience. It also allows for the optimization of delivery routes and distribution strategies [5].

While these programs are feature-rich, they do not consider Pakistan's unique environment and network architecture. With an estimated rural percentage of 63.09% [6] and a ranking of 86th out of 100 surveyed countries in terms of the quality and breadth of available internet infrastructure [7-9] clients would find it unsuitable to be burdened by high costs of 3G/4G data usage, even with comparatively cheaper access to the internet in comparison with other sub continental countries. For now we have targeted the developed cities of Pakistan like Islamabad,

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Karachi and Lahore which comes under Urban Population. The application will be tested in the rural areas once it will be stable and have the availability of all the required features.

III. METHODOLOGY

Figure 1 depicts a basic TracWork process; two mobile applications, Employee App and Manager App, as well as an admin dashboard, will be available. The employee will use the employee app to complete the tasks assigned to him/her; additionally, the app will record their activity with a timestamp. All of this information will be displayed on the manager app, where the manager can assign tasks or receive updates on those that are already in progress [10].

IV. TRACKWORK

The writers of this research developed an employee tracking system with the assistance of similar products on the market. The workings of existing systems are not published, and any algorithms employed by third parties are referred to as proprietary algorithms. The package consists of two mobile applications built with the Flutter Framework for Hybrid Mobile App Development, as well as an admin dashboard and APIs built using ASP.NET. Furthermore, the system's database was MySQL.

Figure 2 shows the Deployment diagram of TracWork which shows a detailed description of all the components, user interfaces with the designs, and the objects and actions on each screen.

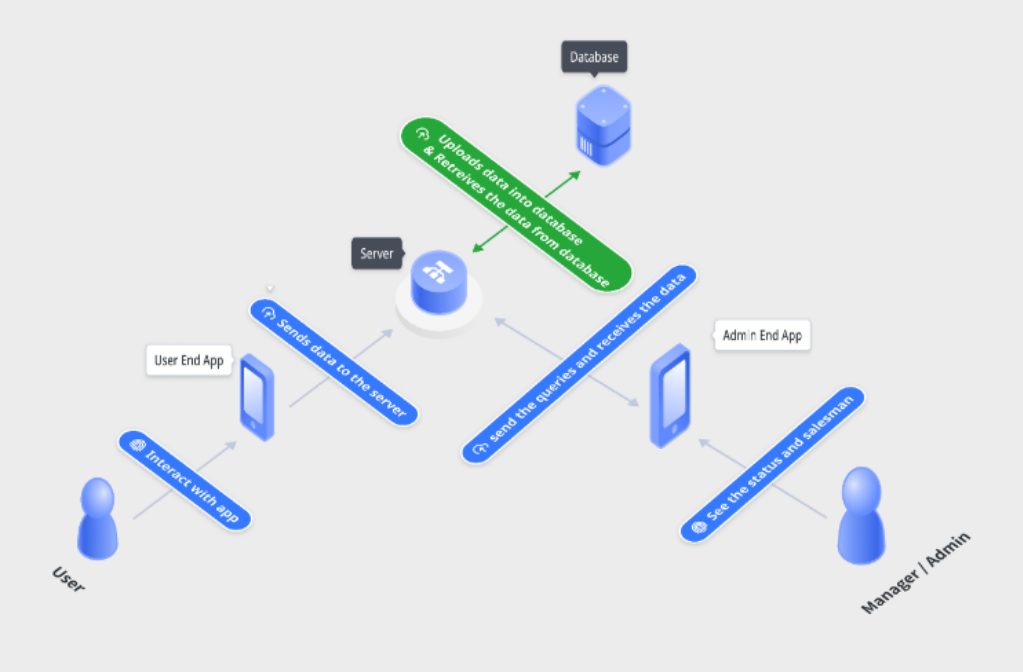


Fig. 1. Proposed Methodology.

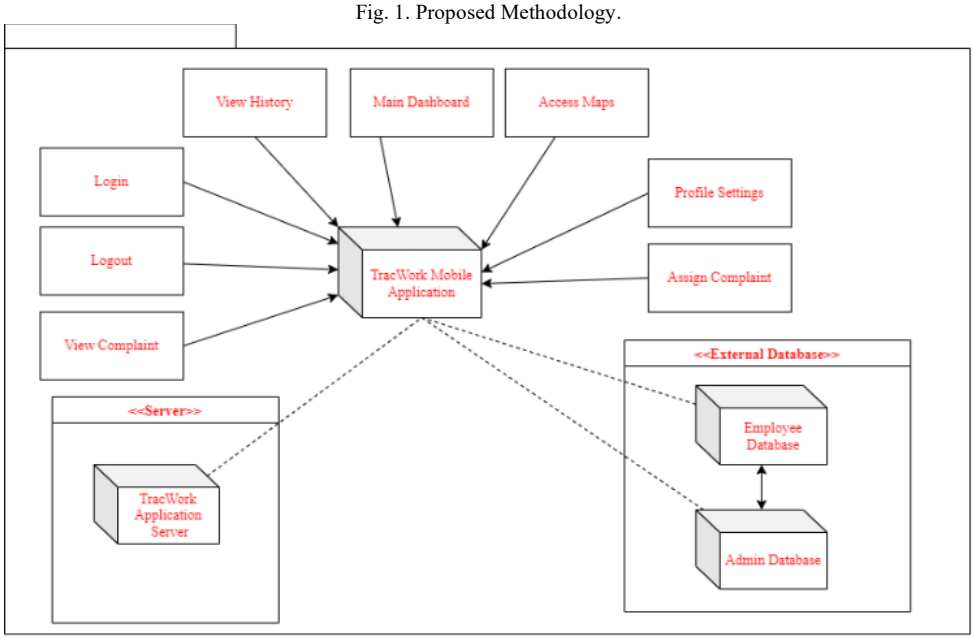


Fig. 2. TracWork Deployment Diagram.

A. System Interface Description

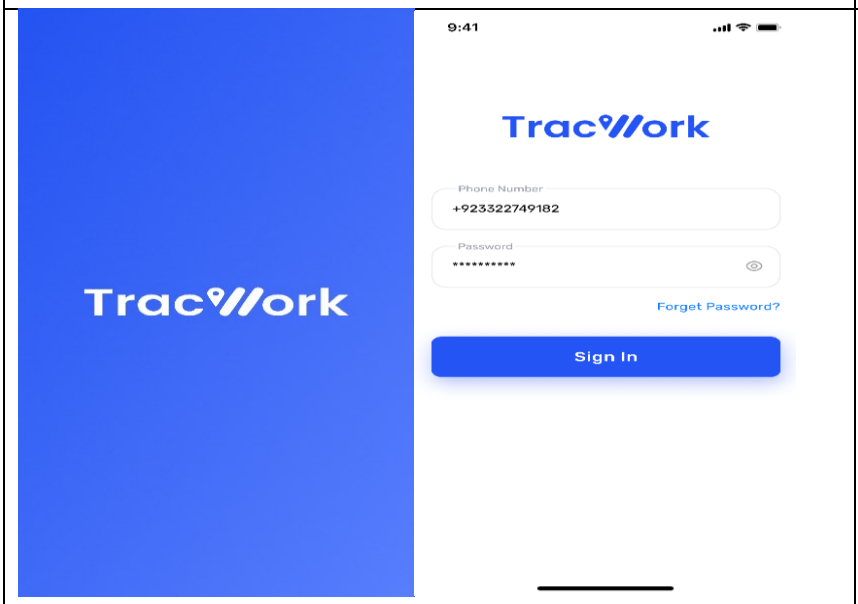
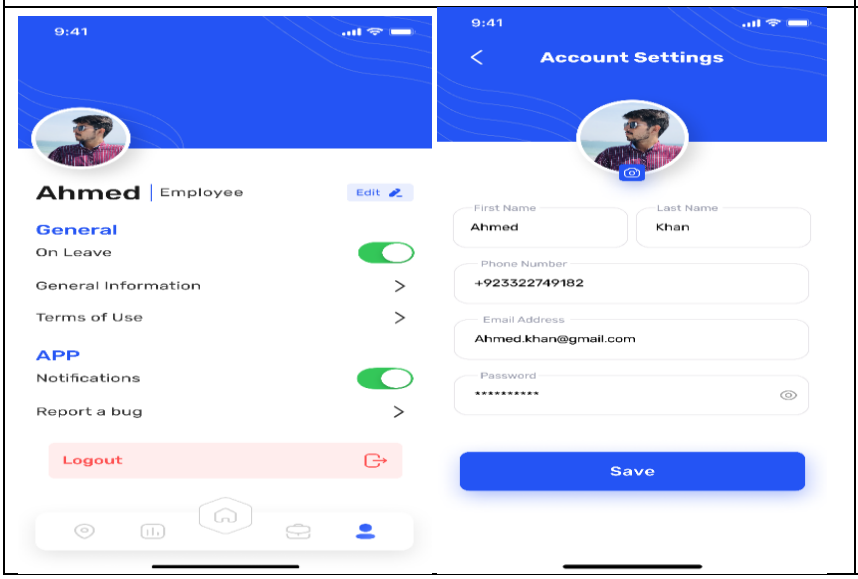
Following interfaces will be responsible for the successful execution of this application:

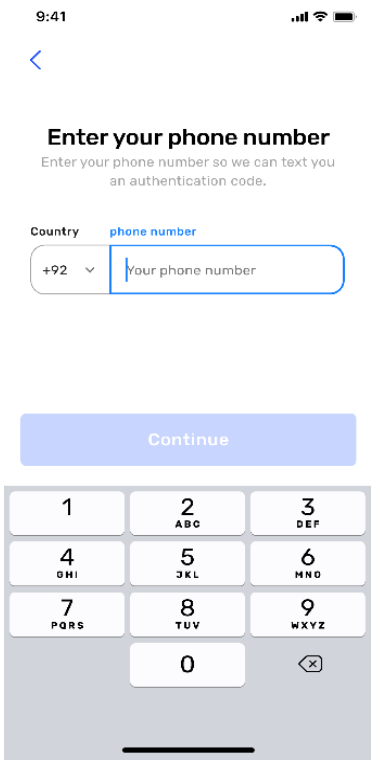
- **Splash Screen/ Login Screen:** Allow users (Employee/ Admin) to log into the application.
- **Profile Settings Screen:** The profile settings screen will list of general and app setting and the users can perform the following actions:
  - Users can view the terms of use, report a bug, and view general information.
  - Users can toggle notifications on/off.
  - Users can set if he/she is on leave or not.
  - Users can edit his/her profile information.
  - Users can logout of the app.
- **Reset Password:** The Admin/ Employee can change password with the help of Phone no.
- **Dashboard Screen (Admin):** Admin can view the status of the Employee.
- **Map Screen:** The following activities can be performed:

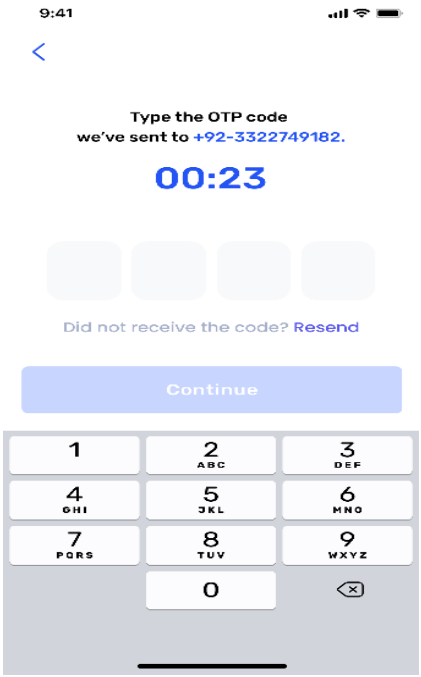
  Shows locations of all employees.

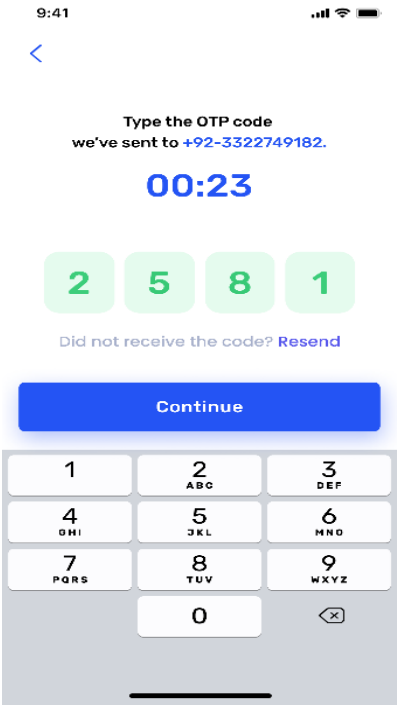
  Admin can assign a task/complaint to any of the employees from the map screen, which will take admin to the assign complaint screen.
- **Assigning Complaints Screen (Admin):** Admin can view the complaints and assign complaints to the active Employees.
- **Employee's list screen & Employee Details Screen:**

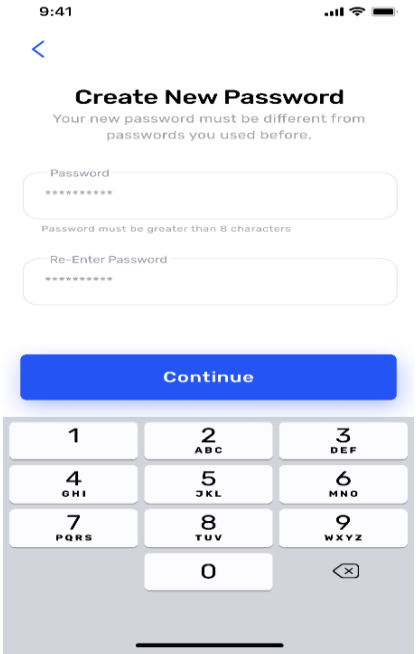
  Shows the list of all employees along with their current status and contact details. Shows detailed information about any specific employee.
- **Dashboard Screen (Employee):** Employee can view its weekly and monthly progress and also change its status (Like Active, Prayer, Lunch etc). This screen will show a detailed report of employee's progress history.
- **Complaints Screen (Employee):** Employees can see the assigned complaints and set their status.

Screen	Description
	**Splash Screen & Login Screen** 1. Splash screen: First screen of app 2. Login screen: a. Admin/Employee will log into the app using his/her phone number and password. b. If the admin/employee doesn't remember the password, he/she can navigate to the forgot password screen.
	**Profile Setting Screen** 1. The main profile settings screen will list of general and app settings. 2. User can view the terms of use, report a bug, and view general information. 3. User can toggle notifications on/off. 4. User can set if he/she is on leave or not. 5. User can edit his/her profile information.



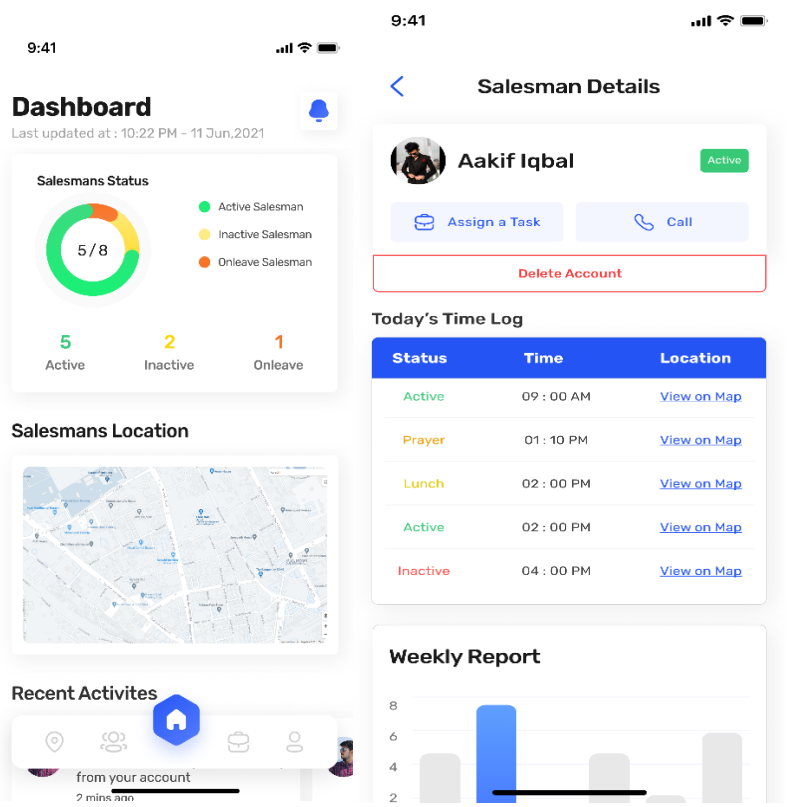


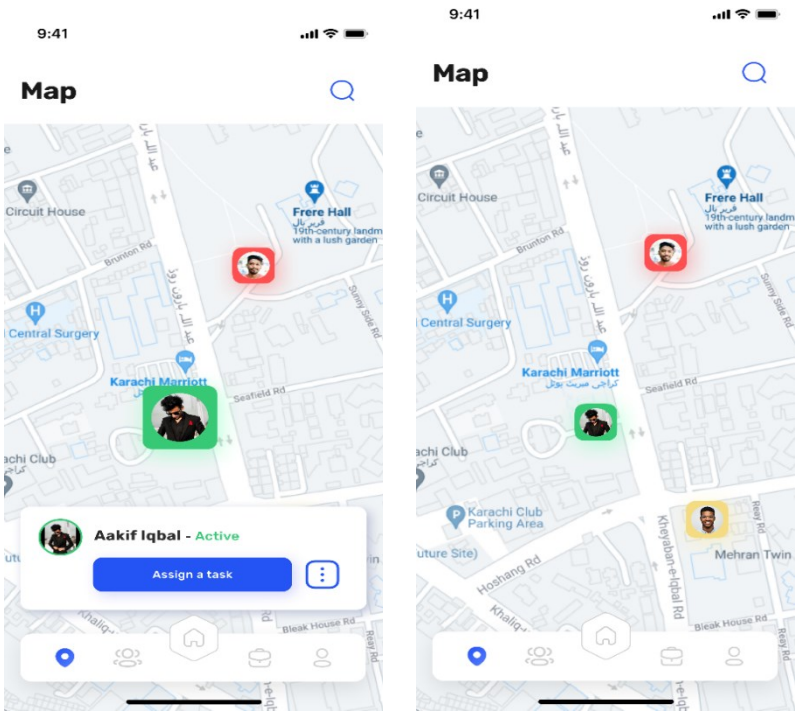




Reset Password Screen

1. The Admin/Employee can change the password if forgot with the help of phone no.
2. The application will generate an OTP which can be entered.
3. After entering OTP a screen for setting new password will appear.
4. The Admin/Employee can now set the new password.
5. After setting and confirmation of new password they can Login to the Application.

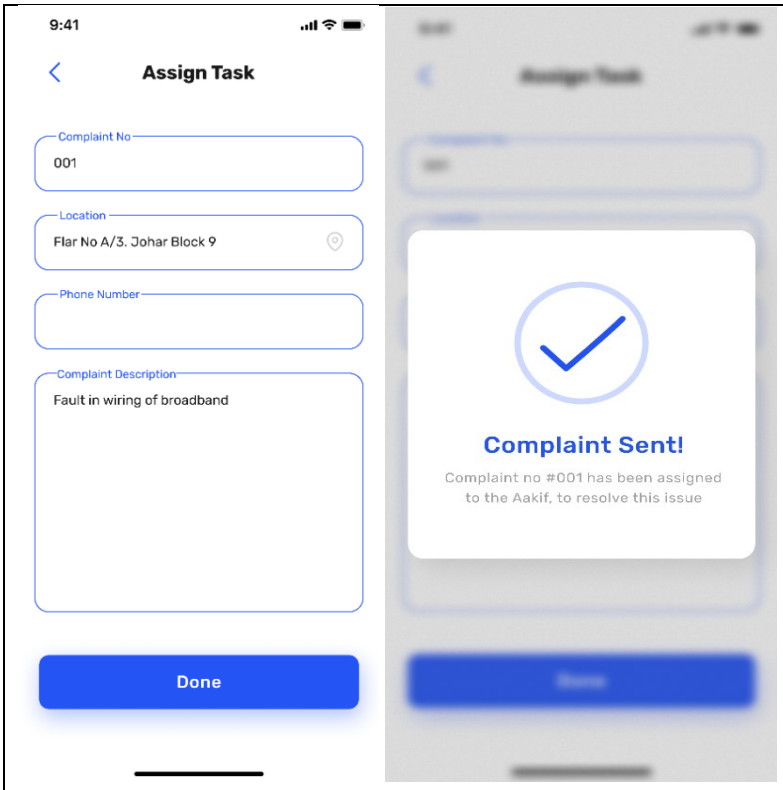




Dashboard Screen (Admin)

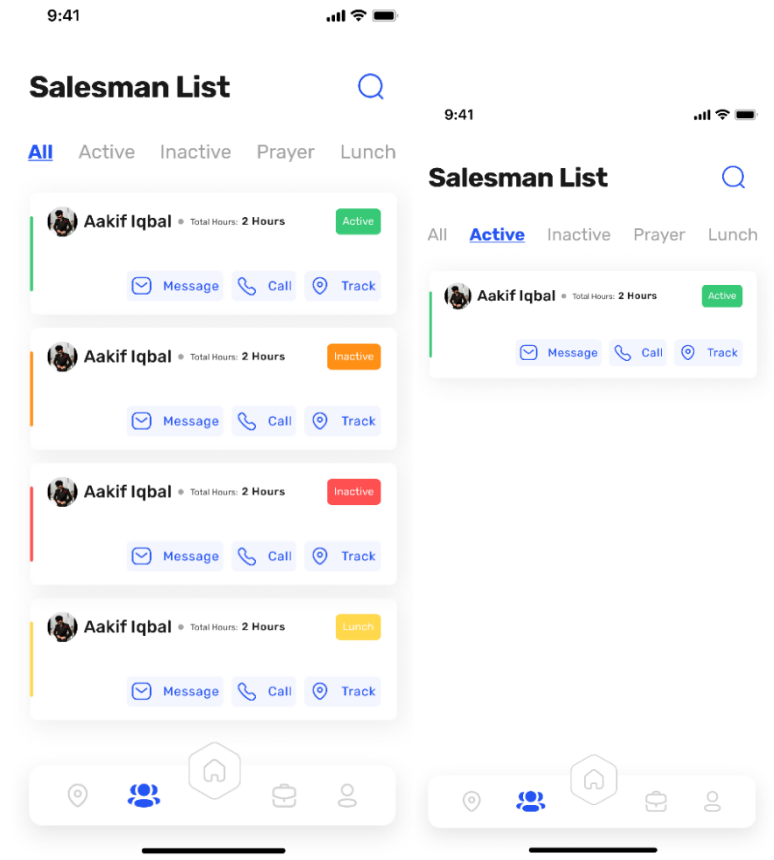
Admin can view the status of employees.

1. Admin can view their recent activities.
2. Admin can view the details of any specific salesman.
3. Admin can view employee's current locations on map.



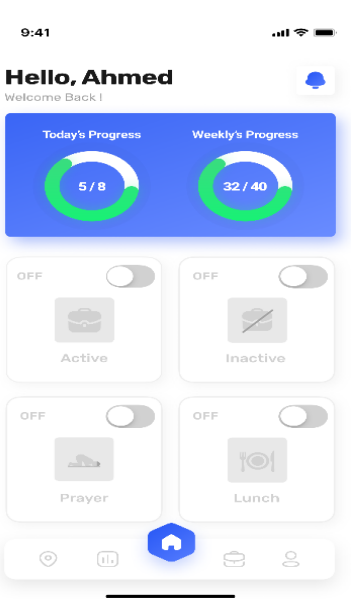
Assigning Complaint Screen (Admin)

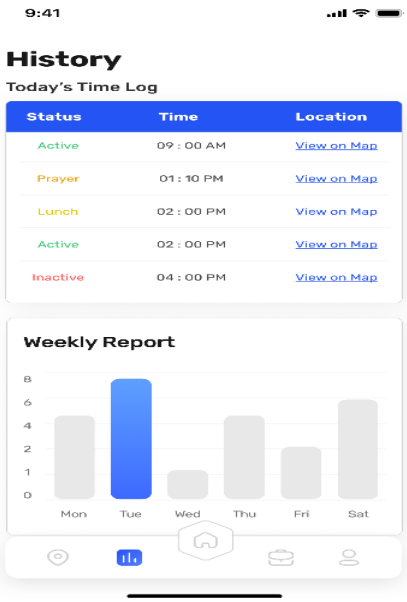
1. Assign complaint screen:
   Admin can assign a complaint to any of the employees.
2. View complaints screen:
   Admin can view all the complaints.



Employee list and Detailed View Screen

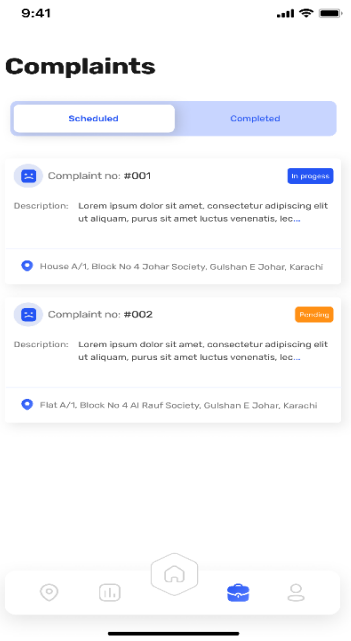
1. Shows the list of all employees along with their current status and contact details.
2. Shows detailed information about any specific employee.

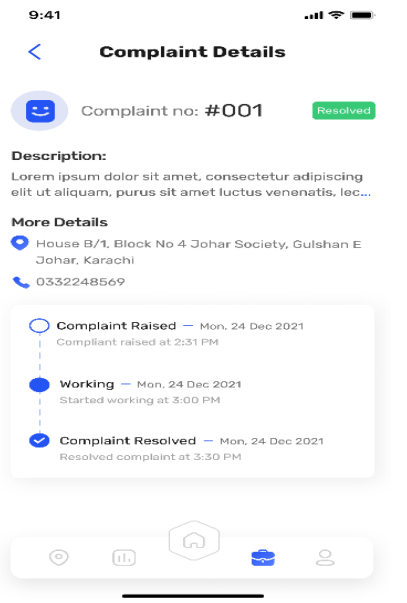




Dashboard Screen (Employee)

1. After logging in, the dashboard screen will be opened.
2. User can view his daily progress and weekly progress.
3. Notifications can be accessed from dashboard
4. Employee can set current status.
5. Employee can navigate to other screens using the bottom navigation.





Complaint Screen (Employee)

1. Complaint screen:
   This screen will list all complaints.
2. Complaint details screen:
   This screen will list details of each complaint.

V. Conclusion

TracWork's mission is to enable employers and managers to quantify and increase the productivity of their on-site workforce. It is a versatile application capable of catering to a wide range of clients with varying requirements, with the primary goal of ensuring efficiency, increasing productivity, and promoting healthy workplace dynamics. Employers can use TracWork to track employee movement and ensure safe travel. They can also mark attendance, monitor break times, and track in real-time as well as in low-power mode. This project will result in an application that, first and foremost, increases productivity levels, which many employers may consider its main selling point.

VI. Futurework

Moving forward, the single most valuable feature yet to be implemented would be task management, where an admin is able to check what task, an employee was performing at a given time and at what location, as well as how much time it took them to complete the task. Additionally, we would like to implement the added functionality to enable employees to automatically take on tasks based on their current location, similar to what Careem or Uber does for its drivers, i.e., they are assigned rides based on their location and the customer nearest to them. Another feature we would like to introduce is to be able to give an estimate of the time it would take an employee to complete a task based on the nature of that task and other factors such as location, weather, age of the employee, terrain etc. This application can also be implemented on international levels by introducing it in other countries. In future this application will also be translated in different languages i.e.: Urdu, French, Spanish, to enhance its usability.

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