SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

System Requirement Specifications for HelpMe Mobile Application

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2 Problem Statement

The SkillsFuture initiative has enabled the Singaporean community to learn a vast variety of skills. There exists a diverse pool of people in the country that has developed skills ranging from house repair to baking but with no platform to provide these services. The current solutions in the market either require users to pay a platform fee or do not have the proper infrastructure to showcase the user's services. On the other hand, people needing these services also do not have a platform to request. Currently, individuals need to source for services online, with companies often not revealing the price of these services. Applications such as Carousell and Facebook do not link service providers to consumers and vice versa.

3 Overview

3.1 Background

According to a 2021 newsletter by the Singapore Department of Statistics, Covid-19 has caused many people in the food and beverage industry, and especially in the catering business, to lose their jobs. That has led to an increased number of job seekers at the current time. With inflation on the rise, as shown in the Singapore Consumer Price Index of July 2022, people who did not need to work before found themselves needing to look for short-term work to support themselves and their families. The app will help to connect such people with potential employers.

3.2 Overall Description

HelpMe is a mobile application that is built to offer and request various types of services from participating user-base. With the help of rating system to offer client a better sense-making decision of choosing its service-provider (eg. Repairs, Baby-Sitting… etc) with more reliable reviews.

Core functionalities of HelpMe includes: Offer Services, Requesting for Services, Looking for Services, and Giving Service contractors rating upon completion of service.

4 Investigation & Analysis Methodology

4.1 Analysis Methodology

4.1.1 Feasibility study and requirements elicitation

Organise a development and implementation team composed of people knowledgeable about the android development and database with which weekly meetings should be held. This can also help to ensure the system is feasible and can be developed within the current time frame. Competitive analysis of the current market is conducted to study similar applications for comparison.(e.g. Carousell, Facebook marketplace) Interviews and surveys will be conducted to study the market, from various profession experts, to a diverse age-range sample group to better understand the key and core features needed to be present for a seamless, reliable user experience. Changes may/will be made to the requirements to make sure a simple yet appropriate application is developed based upon the results of our study.

4.1.2 System analysis and requirements specification

4.1.2.1 Perform an analysis of the problem using object-oriented techniques

An external view of the application will be developed using Unified Modelling Language (UML). This System Requirement Specifications (SRS) documents will form part of the documentation for the project. Some desired features of the new system include:

- ➢ Account Creation as a new user.
- ➢ Login and Account Verification System.
- ➢ Provide a list/grid view of the current services request/offer on the market.
- ➢ Allow users to offer a desired professional service.
- ➢ Allow users to request for a desired professional service.
- ➢ Allow users to rate the service provider upon completion of service.

4.1.2.2 Scope and Limitations

Analysis methodology will involve business analysis, requirement analysis, data analysis, process analysis, (web) and application architecture:

 Requirement analysis – System I/O description, user requirement definition, functional and security requirement

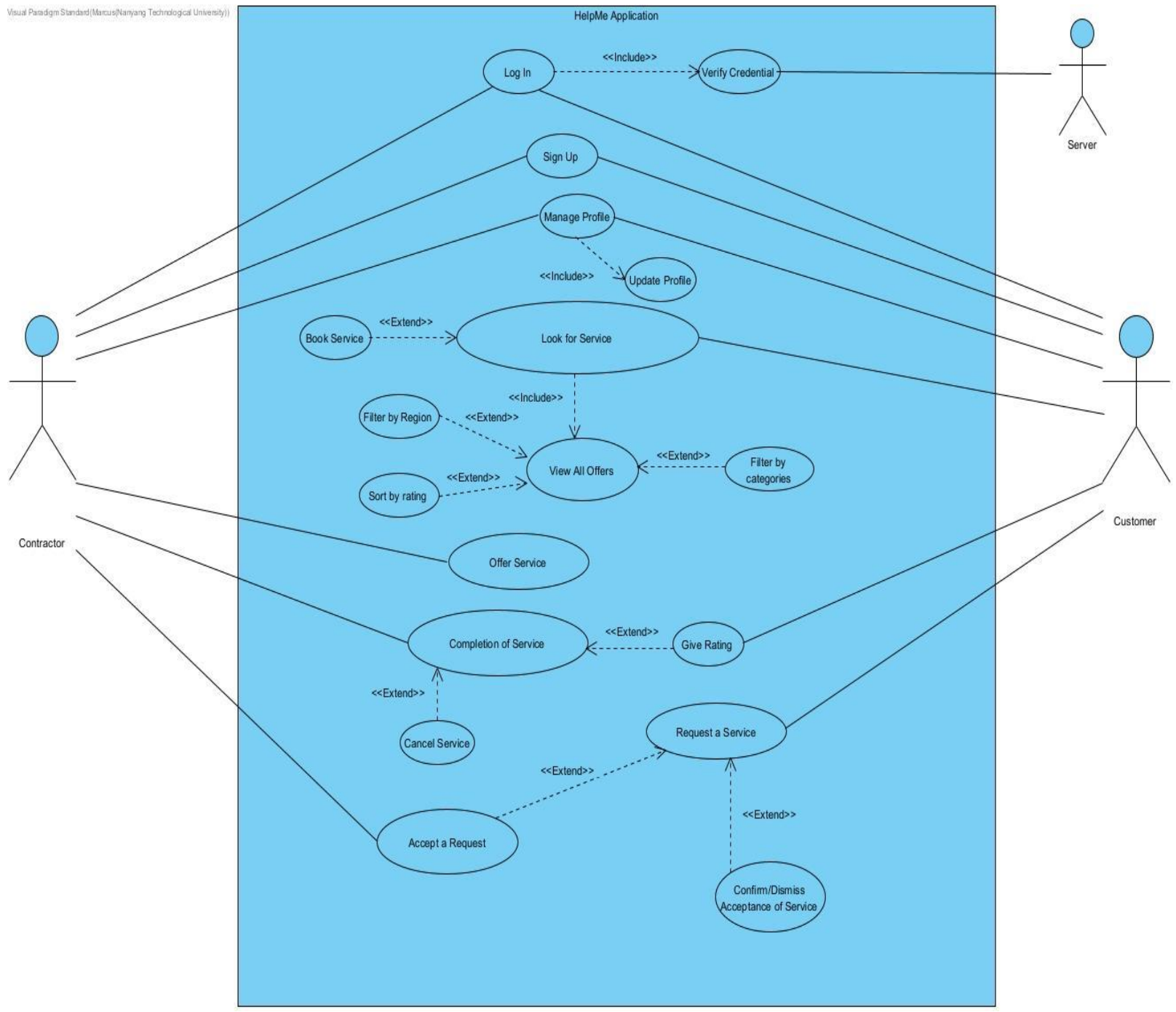
- Account Management
- Authentication
- Offering of Service
- Booking of Service
- Look for Service Offers
- Filtering and Sorting
- Requesting of Service

- Completion of Service
- Accepting of Request
- Data analysis – Involve data collection process, data validation, data storage, manipulation and retrieval
- User's credential will be collected during account creation
- Credentials will be stored in database
- Retrieval of data will occur during authentication and profile updates
- Request/offer of services will be collected after submission of form
- Information of services will be stored in database
- Retrieval of data will occur during viewing and booking of services
- Process analysis – Data/process flow analysis, process decomposition and system interfaces
- Application architecture – Analyse application information structure, usability, user interface design, interaction and application implementation.

4.1.3 Object-oriented design using UML

A detailed object-oriented design for the registration system will be developed. UML will be used for the graphical representation and documentation of the design. This system will be used for the entirety of the application. At registration, users will fill out or answer a form that will be processed by FireBase. With the account created, FireBase creates the user's account to allow access into the application.

Within the application, users will be able to provide a list/grid view of the current services requested/offered on the market, offering a desired professional service, request for a desired professional service, and rate the service provider upon completion of service.



4.1.3.1 Use Case 1

4.1.4 Prototyping

The Object Oriented Rapid Prototyping (OORP) method will be used to implement a limited and functional prototype for the application. The prototype will be a working example of part of the system for demonstration and proof of concept purposes only. It will include the basic functionalities such as posting, requesting and accepting requests with Firebase as the database.

5 Constraints

5.1 Scalability

With consideration to various mobile devices version and screen sizes, the UI design needs to cater for usability and seamless user experience on a range of devices.

5.2 Latencies

Mobile applications need to work within the given main memory limits. Application should be responsive when transiting between different interfaces whilst aim to minimize memory usage and cache size.

5.3 Network issues

Access to a working functional network is needed to establish contact with service providers and clients. Application should factor in network latencies and failure points and attempt to re-establish connection.

5.4 Project Schedule

There is a three month timeframe to implement a full-fledged running application from project commencement before submission deadline

6 Operational Requirements

6.1 Help Desk Support

Application users will be able to contact the helpdesk via email for assistance or questions that are technical in nature, such as, slow or sluggish system response time, missing features, application errors, system downtime inquiries, account lock-out assistance, etc.

6.2 Application Services and Technical support

Programmers and application developers will have access to source code to address bugs or system enhancements as deemed necessary. Since the application communicates through Firebase, the application will rely on Firebase for technical communication support.

6.3 Administration Features

Administrator privilege access will be through Firebase, all users will have the same interface and features. Administrators can add/ delete/ edit account information.

7 Functional Requirements

The HelpMe application is an android platform that allows users to act as both contractors offering services and customer booking those services, and users will also be able to manage their own profile such as changing the password or email address. The following are functionalities that need to be incorporated into the application.

7.1 Account Management

The User Interface (UI) for account creation will act as a form for users to input their credentials such as email address and password which will be submitted and stored in our database for future log in purposes. Once the submission is completed, the user's account will be created.

7.1.1 User Registration

7.1.1.1 The user must be directed to the signup page after pressing the signup button.

7.1.1.2 The user must be able to create an account using their email.

7.1.2 Manage Profile

7.1.2.1 The user must be able to check/modify their profile.

7.1.2.2 The system must direct the user to the user profile page once the user presses the user profile button.

7.1.2.3 The system must update the new information to the database.

7.2 Authentication

The authentication process will require the users to input their credentials such as email and password which will be validated against our database that contains the users' previously entered credentials during the account creation process. Once the credentials are validated, the user will either be given access to the application or be prompted to re-enter their credentials.

7.2.1 User Login

7.2.1.1 The user must be directed to the login page after pressing the login button.

7.2.1.2 The system must verify if the credentials are valid.

7.2.1.3 If the credentials are valid, the user must be logged into the application and directed to the home page

7.2.1.4 If the user enters the wrong credentials, the system must prompt the user to re-enter their details.

7.3 Offering of Service

Users (Contractor) shall be able to offer services by completing a form that requires information of the service provided such as the name, category and details of the service.

7.4 Booking of Service

Users shall be able to view all services provided, sort them by category and book them when interested.

7.4.1 Look for Service Offers

7.4.1.1 The user must be directed to the view services/offers page after pressing on the View Services/Offers.

7.4.1.2 The user must be able to filter or sort the services by:

- Filter by region
- Filter by categories
- Sort by rating

7.4.2 Book Service

7.4.2.1 The user must be able to book a service after pressing book service.

7.5 Requesting of Service

Users (Customer) shall be able to request service by completing a form that requires information of the service requested such as category, description and budget.

7.5.1 Request Service

7.5.1.1 The user must be directed to input their particulars & requests in a form after pressing the create request button.

7.5.1.2 The system must create a new entry of the request in the database once submitted.

7.5.1.3 The system must display the newly added request in the *View Request/Offer* Page.

7.6 Accepting of Request

Users shall be able to view all requests for service, sort them by category and accept them when interested.

7.7 Completion of Service

Users shall be able to label service offered and booked as completed once the job is done. This will prompt the customers to give an optional rating for the service provided.

8 Input Requirements

8.1 User's credentials

Each user will be able to input their username, password and email. To log in, users have to remember the username and password. Email will be used to reset password in the event that the "Forgot password" function is used.. These credentials will be saved in our database and it will be used to authenticate the user for other purposes. Account will be lost if the user forgets either username or password and email.

8.2 Services

Services can be offered and requested on this platform. When offering a service, users will be required to enter the name of their service, assign the service a category based on the given options and give a description of the service. When requesting a service, users will also be required to enter a name for the requested service, assign the service a category based on the given options and give a description of the requested service. This will facilitate the communication between a customer and a contractor.

9 Process Requirements

The following are among the inherent requirements that the application must be able to handle.

9.1 Firebase database communications.

The application must be able to send, retrieve and store accounts details and user requests from Firebase.

9.2 Data integrity

Application must reflect correct requests according to the database. All running applications must be able to see the same requests in the same order unless filtered. All processes must function as expected by the user and data stored must be accurate.

9.3 Data validation

Data error from the user's end and from the back-end database-processing end must be gracefully handled. There will be data validation and error-handling algorithms for each action done.

9.4 Performance

Application must run smoothly with little to no lag, application should not crash unexpectedly completing user inputs. Database communication should only bottleneck at network speed, not at application performance.

9.5 Data repository

The Application will be using Firebase database as the main repository of request and user accounts.

10 Output Requirements

10.1 Transaction summary and confirmation

Upon confirmation of user booking for a requested service, User and service provider will both have a receipt of transactions shown in the main page dashboard. Transaction will be shown as "In-Progress". Upon completion of required services, the Service Provider will end the transaction by clicking "Service Completed". Status of transaction will be changed to "Completed". The transaction record will be shifted to the Transaction History Tab for future references.

10.2 Creation of Offered Services/ Request for Services

Once Service Providers or Users input required parameters , a record will be created and be displayed

on the Viewing Tab. The record will be shown to all users on the platform for further actions such as accepting an offer, or answering a service request.

11 Hardware Requirements

11.1 Network

A stable and high-speed wireless connection is required for stable functioning of the application. We recommend a minimum speed of 10 Mbps to ensure smooth functioning of the application. The bandwidth used by our application will be optimised for the best experience based on the participant's network. It will automatically adjust for 3G, 4G or Wi-Fi environments.

11.2 Client Device

Any device that is able to utilise Android - Kitkat 4.4.x or newer.

11.3 Backend & Database (Firebase)

HelpMe utilises Google's Firebase (A Backend-as-a-Service cloud infrastructure) to handle all its backend and database requirements. It is an application development software that enables developers to develop iOS, Android and Web apps. Firebase also provides essential tools for tracking analytics, reporting and fixing app crashes, creating marketing and product experiments.

The services HelpMe leverages are as follows:

- Authentication – Firebase Authentication makes it easy for developers to build secure authentication systems and enhances the sign-in and onboarding experience for users. This feature offers a complete identity solution, supporting email and password accounts, phone auth, as well as Google, Facebook, GitHub, Twitter login and more.

- Realtime database – the Firebase Realtime Database is a cloud-hosted NoSQL database that enables data to be stored and synced between users in real time. The data is synced across all clients in real time and is still available when an app goes offline.

12 Software Requirements

12.1 Client Operating Systems & Application

Android – KitKat, API level 19, 4.4.x or newer

- Android is a mobile operating system based on a modified version of the Linux kernel and other open-source software, designed primarily for touchscreen mobile devices such as smartphones and table

12.2 Mainframe system

- Android System
- Firebase Database

12.3 Licences

Valid licences are required to run software from third party vendors:

- Licence is required for higher number of storage, and transaction use on a monthly basis. Not required for the prototyping phase.