Software Requirements Specification

Whereabouts

Version 1.0

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Contents

1. Introduction

1.1 Purpose

Whereabouts is an android application which provides **a location based** messaging service to users. This application provides a fun way to interact with peers based on their location. This helps in saving time by contacting the right person for a job to be done based on their closeness to a person or place of interest**.**

1.2 Scope

The android application Whereabouts will allow the students at BITS, Pilani to locate each other on campus and provide them instant messaging service.

1.3 Environmental Characteristics

The application will run on a GPS enabled smart phone with Android operating system. The app would require reliable internet connectivity and GPS services.

1.4 Definitions, Acronyms, and Abbreviations

App- Android application

BITS- Birla Institute of Technology and Science

PU- Placement Unit, BITS, Pilani

Peer- When a user accepts the connection request from another user, both users are said to peers of each other.

User- Anyone using the application is a User.

Pdf- Portable document format

GPS- Global positioning system

1.5 References

- IEEE. *IEEE Std 830-1998 IEEE Recommended Practice for Software Requirements Specifications.* IEEE Computer Society, 1998.
- [1] A. Rezi and M. Allam, "Techniques in array processing by means of transformations, " in Communications and Multimedia, International Conference on Telecommunications and Multimedia (TEMU), IEEE, 2016
- [2] Penghui Li and Yan Chen, "Implementation of Cloud Messaging System Based on GCM Service" in Proceedings, ICCIS '13 Proceedings of the 2013 International Conference on Computational and Information Sciences, 24 October 2013, pp 1509-1512
- [3] Yavuz Selim Yilmaz, "Google Cloud Messaging (GCM): An Evaluation" in GLOBECOM, 12 February 2015, Semantics Scholar[4] Xiufeng Liu, "Location-based mobile instant messaging system", , 2012 2nd International Conference on Consumer Electronics, Communications and Networks (CECNet), IEEE, 20122. General Description

2.1 Product Perspective

Whereabouts is a new Android application that provides location based messaging services to its users.

2.2 Product Features

The proposed system aims at providing the below mentioned features to a user-

- Instant messaging services between peers.

- Location tracking of peers
- On request location tracking by a peer-Track me feature.
- Dropping message-message to be received by a peer based on location and time window

2.3 User Classes

Student	A student at BITS, Pilani who wishes to connect to his peers will use this application to know their location and interact with them using instant messaging service provided by the app.

2.4 Operating environment

- **Mobile device:** The app would run reliably on a smart phone with at least Android 4.4.4(Kitkat) operating system,1 GB RAM, reliable internet connectivity(2G/3G/4G) to provide GPS services and 4.3 inches screen size.
- **Android OS:** Android OS is a Linux-based platform for mobile phones
- **Firebase Cloud Services:** This provides cloud and backend services (provides the application with database, authentication support and cloud based messaging).

2.5 User Documentation

A user guide will be provided to the end user along with the application. This guide will provide a detailed description of features of the application along with step by step guidance regarding their usage. It will be provided to the users in a downloadable pdf format which will be embedded in the application itself.

2.6 Assumptions and Dependencies

- User must know how to operate a mobile phone.

3. Specific Requirements

3.1 Functional Requirements

3.1.1 Register User

- ***Description:*** To register a user in the app, the details of the user such as name, age, gender, contact number and interests are entered. This is stored in the database and a unique id number for a user is generated.
- ***Inputs:*** User details
- ***Outputs:*** Unique id number

3.1.2 Send request

- ***Description***: To connect with other users using the application, user sends a connection request. If the other user accepts the request, both the users become peers of each other. An acceptance message is displayed to the user on acceptance of connection request.
- ***Inputs:*** Contact number of user to whom connection request is to be sent.
- ***Outputs:*** Message displaying *Request Sent* and *Request Accepted* message(if request is accepted)

3.1.3 Track Location

- ***Description***: To track location of a peer, a user must provide the contact number of the peer to be searched in the application. The location of the peer who has been searched for, is displayed to the user.
- ***Inputs:*** Contact number of peer whose location is to be tracked
- ***Outputs:*** Location of peer

3.1.4 Send message

- ***Description***: To send message to a peer, a user must provide the contact number of the peer to be searched in the application. The user can only search from list of his peers.
- ***Inputs:*** Contact number of peer to whom message is to be sent.
- ***Outputs:*** Message displayed to the peer.

3.1.5 Track ME

- ***Description***: When a user wants that his location track be sent to a peer, he can enable this feature and the location track will be shared with that peer.
- ***Inputs:*** Contact number of peer with whom location track is to be shared
- ***Outputs:*** Location track of user will be displayed to the peer

3.1.6 Drop Message

- ***Description***: The user can schedule a message that would be delivered to a peer only if the peer is within 100 meters of a location and in a given time window.
- ***Inputs:*** Contact number of the required peer, Coordinates of location and date & time range
- ***Outputs:*** Prompt confirming *Message is scheduled* to the user and Message will be displayed to the peer if he is at the desired place within the desired time window.

3.2 Non Functional Requirements

3.2.1 External Interface Requirements

3.2.1.1 User Interfaces

UI-1: The app shall provide a map view of BITS, Pilani campus and location of users using markers on the map.

UI-2: The app shall provide a screen for sending message to a particular peer

3.2.1.2 Hardware Interfaces

No hardware interfaces have been identified.

3.2.1.3 Software Interfaces

Firebase is a cloud services provider and backend as a service that will provide the application with database & authentication support, cloud based messaging **and usage statistics.**

Input: coordinates of locations, peer messages, user login details (authentication)

Output: acknowledgements, server messages, peer messages

3.2.1.4 Communications Interfaces

SSE i.e. Server Sent Event an option for the REST API for real time updates to be streamed back to application.

Application will use **web-sockets** with long polling fallback to send messages to Firebase server.

3.2.2 Design and Implementation Constraints

CO-1: The system shall use the Firebase cloud services.

CO-2: All code will be written in JAVA.

CO-3: Mobile device should be compatible with Android 4.4.4(Kitkat) and above.

3.2.3 Other Non-Functional Requirements

3.2.3.1 *Performance Requirements*

PE-1: Map shall take no longer than 5 seconds to load onto the screen after the user logs in.

PE-2: The system shall display messages to peer within 4 seconds after the user submits message to be sent the system over a 3G network.

PE-3: The location markers should get updated within 5 seconds.

3.2.3.2 *Security*

SE-1: Users shall be required to log in using Google account to the application usage.

SE-2: Only peers shall be allowed to track and message each other.

SE-3: The messaging history of users will be achieved only on user device and will be stored on the server for buffering purpose only and then after message delivery will be deleted from the server.

3.2.3.3 *Safety*

SA-1: The app shall provide the provision of retrieval of only those messages which are not yet received on the user device in case of abrupt power/system failure of mobile device.