

# **Software Requirements Specification**

for



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## **1. Introduction**

### **1.1 Purpose**

This document describes in substantial detail, the software requirements of WhatsApp, an online instant messaging application. This document will describe the problems WhatsApp intends to address, the functional requirements and non-functional requirements of the proposed system.

### **1.2 Document Conventions: Font: TNR 12**

### **1.3 Intended Audience and Reading Suggestions**

This document is intended for the stakeholders of the application, to assist in the development process of WhatsApp as well as to serve a reference to clarify any future issues that the stakeholders may run into.

### **1.4 Definitions, abbreviations**

#### **1.4.1 Definitions**

##### **Account**

A User must have a device on which he can run the Application. Device can either run on Android, IOS, Blackberry, Windows or Symbian. User Account is linked to the contact information he provided during the initialization of the application. User can be contact only with that information.

##### **Last Seen, Profile Picture, Status, Receipts**

User can put up a profile picture to indicate his appearance. Last seen of a user indicates the last point in time when the user used the application. Status indicates the written statement about himself or his state or mood depending in the usage to all his recipients. Receipts indicate the status the message sent to any recipient. Single receipt indicates that the message has been sent from the user' end. Double receipt indicates that the message has been received by the other party. Blue colored receipt indicates that the recipient has read the message.

## **Network Usage**

In order to enjoy seamless benefit of WhatsApp, User is supposed to be connected to Internet at any given point of time. WhatsApp uses considerably lesser network resources than any other chatting application available in the market. WhatsApp also provides the user with the option to limit resources to incoming media.

## **Recipient**

WhatsApp can be used to converse with more than a single user at any given point of time. The recipient must also use the application on the other end of the conversation. The Contact information to which the Whatsapp Account is linked is to be saved in the user contacts in order to start a new conversation with the recipient.

## **Group**

A Group of users ranging from 1-256 can be added into a group and can be conversed with at the same time. Any group user can add new members into the group not exceeding 150. Only the Group Admin has the executive permissions to remove a member of the group. Group admin can also provide other members of the group with Admin permissions.

## **Broadcast Messages**

A user can broadcast same message to 1-150 user at the same time with the broadcast option. Users with his contact information can only receive the message.

## **Privacy**

Whatsapp provides seamless ways to save the user's privacy. User can decide which information is available for other users to view and which information isn't. Information like Last seen, Profile Picture, Status can be put out for view to everyone or only to contacts or no one.

## **Backup**

An Encrypted Backup of all the conversations is saved in Internal Memory in case of an Android device, BlackBerry devices and in Cloud in case of an iOS device. Backup is encrypted in order to avoid misuse of the metadata of the Application.

## **1.5 Project Scope**

WhatsApp is a proprietary, cross-platform, encrypted instant messaging client for smartphones. It uses the Internet to send text messages, documents, images, video, user location and audio messages to other users using standard cellular mobile numbers. As of February 2016, WhatsApp had a user base of one billion, making it the most popular messaging application. WhatsApp Inc., based in Mountain View, California, United States, was acquired by Facebook Inc. on February 19, 2014, for approximately US\$19.3 billion.

## **2. Overall Description**

### **2.1 Product Perspective**

WhatsApp does not work independently. It works together with the internal servers and sending and receiving application on either end devices.

**Communication interface:** WhatsApp communicates with the internal servers via a communication network.

**Software interface:** The messages sent via the communication network are specific to the target recipient. At any point, two known users will participate in the application.

**Hardware interface:** The software will run on any device running on iOS, Android, Symbian, BlackBerry operating systems.

**User interfaces:** The GUI of the Application is user friendly and need no external assistance to understand the application.

**Customer:** The customer user interface should be intuitive, such that 99.9% of all new WhatsApp users are able to use the Application without any assistance.

**Message Processing:** Every message send through the application is processed by the internal servers and sent to the recipient. Message processing is done at very high processing rates so as to avoid delay in the conversations between the users. A maximum of 27 billion messages are processed in a single day by WhatsApp internal servers.

### **2.2 Product Features**

WhatsApp should work 24 hrs. The Application on a smartphone is linked to a single user account. It collects information about a simple account transaction (e.g., sent messages, received messages, media transfers, and network usage), communicates with the internal servers for message processing and delivers the message to the recipient in time to receive their reply. WhatsApp provide their own software for their own servers. The internal server software requires appropriate record keeping and security provisions. The software must handle concurrent accesses to the same user correctly.

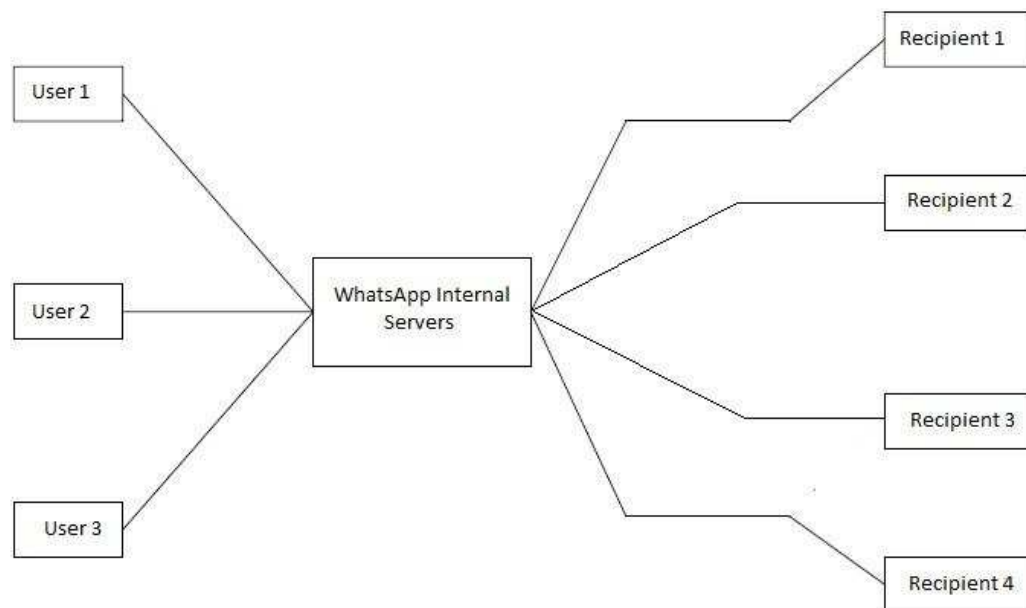


Figure: WhatsApp Network

## 2.3 User Classes and Characteristics

**Characteristics:** There are several users of the WhatsApp network:

**Customers** are simple members of the general public with no special training.

## 2.4 Operating Environment

The hardware, software and technology used should have following specifications:

- Ability to run the Latest Version of Application.

- Ability to use Network resources

- Touch screen for convenience

- Keypad (in case touchpad fails)

- Continuous power supply and network supply

Ability to connect to WhatsApp network

Ability to take input from user

Ability to validate user

## **2.5 Design and Implementation Constraints**

Login

### **Validate User:**

Validate for User's Mobile Number by Verification SMS.

Check for any previous existing User Backups on the device.

If a Backup is available, prompt to "Restore Backup",

## **2.6 Assumptions and Dependencies**

Hardware never fails

Always connected to the Internet

Unlimited number of messages per day

Unlimited number of changes to profile per day

## **3. Specific Requirements**

### **3.1 Functional Requirements**

The functional requirements are organized in two sections First requirements of the application on any device and second requirements of the network resource to connect to the internal servers of WhatsApp.

#### **3.1.1 Requirements of WhatsApp**

The requirements for the working of WhatsApp Application are organized in the following way General requirements, requirements for authorization, and requirements for a transaction.

## General Requirements

### Functional requirement 1:

**Description:** If the application on any device is not connected to the Internet, the system should display initial display.

### Functional requirement 2:

**Description:** *Send a message* function sends a text message to another user of app.

**Inputs:** Inputs are characters, including numbers and the receiver contact from contact list. (Name of the receiver in this case)

**Processing;** Reads the message from the buffer, stores it in the sender's device DB, pass it to the Central DB and passes the message to receiver and stores it in the receiver's device DB. Sender then gets indication of receiving the message by the receiver and indication of reading the message by the receiver. (Sender gets mark on the message when receiver gets the message and double mark when receiver opens the message)

**Outputs:** Mark at the sender's side – when receiver gets the message in his device. Double mark at the sender's side – when receiver opens the message. The message itself – stored in Central DB, Stored in the sender's and the receiver's devices DB for history. Notification at sender's side if the message wasn't transferred to receiver.

### Functional requirement 3:

**Description:** *User Registration* User is able to register for the application through a valid phone number. On installing the application, user must be prompted to register their phone number. If user skips this step, application will close. The user's phone number will be the unique identifier of his/her account on WhatsApp.

### Functional requirement 4:

**Description:** *Adding New Contacts* The application is able detect all contacts from the user's phone book. If any of the contacts have user accounts with WhatsApp, those contacts must automatically be added to the user's contact list on WhatsApp. If any of the contacts have not yet registered on WhatsApp, user is provided with an invite option that sends those contacts a regular text message asking them to join WhatsApp along with a link to the WhatsApp application on Google Playstore or respective store depending on the Operating system the device is running.



**Functional requirement 5:**

**Description:** *Send Message* User is able to send instant message to any contact on his/her WhatsApp contact list. User will be notified when message is successfully delivered to the recipient by displaying a tick sign next to the message sent.

**Functional requirement 6:**

**Description:** *Send Attachments* User is able to send audio, video and images as attachments.

Audio formats that the application should support: mp3, wav.

Video formats that the application should support: avi, mp4, flv, gif.

Image formats that the application should support: jpeg, png.

**Limitations:** File size must not exceed 2MB per message.

**Functional requirement 7:**

**Description:** *Broadcast Message* User is able to create groups of contacts. User is able to broadcast messages to these groups.

**Limitations:** The recipient should have the sender in his contacts to receive the broadcast.

**Functional requirement 8:**

**Description:** *Message Status* User is be able to get information on whether the message sent has been read by the intended recipient. If recipient reads the message, 2 ticks will appear next to the message read.

**Functional requirement 9:**

**Description:** *Auto Backup* User is able to have all his messages backed up on Cloud or Internal Storage without ever being prompted. User has the choice of setting the frequency by which the backup can be made.

**Functional requirement 10:**

**Description:** The Application should be able to connect to Internet automatically even though the application isn't opened by the user. The Application should stay connect to internet at every point of time if the network resources are available on the device.

**Functional requirement 11:**

**Description:** WhatsApp should be able to distinguish between the network resources like Wi-Fi and Mobile Data in order to perform media respective download operation with respect to said so network resource.

**Functional requirement 12:**

**Description:** User is able to set media download preferences with respect to various network resources available. Media download preferences are with respect to Wi-Fi and Mobile data and different.

**Functional requirement 13:**

**Description:** *Share photo* function sends a picture (photo) to another user of Application.

**Inputs:** Input is the picture in JPEG, GIF etc. formats and the receiver contact from contact list.(Name of the receiver in this case)

**Sender sends existing photo**

Reads photo from the device DB, sends it to receiver, stores it in the receiver's device DB, Sender then gets indication of receiving the photo by the receiver and indication when the photo is viewed by the receiver. (Sender gets mark on the message when receiver gets the photo and double mark when receiver opens the message with the photo)

**Sender takes new picture and sends it**

When sender chooses to send new photo, the camera of sender's device turns on and sender can take photo. After that, stores photo in sender's device DB, sends it to the receiver and stores it in the receiver's device. Sender then gets indication of receiving the photo by the receiver and indication when the photo is viewed by the receiver. (Sender gets mark on the message when receiver gets the photo and double mark when receiver opens the message with the photo)

**Functional requirement 14:**

**Description:** Using User's contact list from the device.

**Processing:** Imports contacts from user's device to contacts DB. Then checks which accounts have the WhatsApp app, by using accounts DB, and then stores this information in the contacts DB (synchronization). All contacts that have WhatsApp Messenger, appear in WhatsApp Messenger contact list on user's device with status. If new contact added to

contacts list of the device, the synchronization executed and new contact added (if new contact has messenger).

**Outputs:** WhatsApp messenger contact list.

### **3.1.2 Requirements of the Application**

#### **Authorization**

The internal servers gets a request from a User account to process and send a message to a recipient.

#### **Functional requirement 1:**

**Description:** Internal servers checking if the user is authentic.

**Input:** Request from the application about its authenticity

**Processing:** Check if the application is a valid application or not

**Output:** Valid or invalid application

#### **Functional requirement 2:**

**Description:** If the application is updated or not

**Input:** Application Version

**Processing:** Process Application Version

**Output:** The Application gets the message “Update” if it’s an older and unsupported application version.

#### **Functional requirement 3:**

**Description:** The Application checks for user data after every update.

**Input:** Check internal encrypted backup for user data

**Processing:** Check User Data

**Output:** Accepts User data or prompts to register again.

#### **Functional requirement 4:**

**Description:** Changes in encryption codes

**Processing:** Checks for changes in security encryption code

**Output:** Prompt regarding encryption changes

### **4. External Interface Requirements**

#### **4.1 User Interfaces**

The customer user interface should be intuitive, such that 99.9% of all new Applications are able to complete their transactions without any assistance

#### **4.2 Hardware Interfaces**

The hardware should have following specifications:

Ability to run the Latest Version of Application.

Ability to use Network resources

Touch screen for convenience

Keypad (in case touchpad fails)

Continuous power supply and network supply

Ability to connect to WhatsApp network

Ability to take input from user

Ability to validate user

#### **4.3 Software Interfaces**

The software interfaces are specific to a proprietary, cross-platform, encrypted instant messaging client

## **5. Other Nonfunctional Requirements**

### **5.1 Performance Requirements**

It must be able to perform in adverse conditions extremely slow internet connections and low battery on device.

Uninterrupted connections

High data transfer rate

### **5.2 Security Requirements**

WhatsApp provides encryption so as to prevent unauthorized access to a message midway. It use 256-Bit SSL encryption to secure data between two users.

### **5.3 Software Quality Attributes**

**5.3.1 Availability:** The WhatsApp internal Server has to be available 24 hours a day.

**5.3.2 Security:** The Application should provide maximal security in order to make that much more transparent there are the following requirements:

It must be impossible to plug into the internal server network.

**5.3.3 Maintainability:** Only maintainers are allowed to connect into internal servers.

## **6. Application Analysis**

Now a days the applications are available for messaging but there is not a single application which can handle multiple things like messaging, privacy, location sharing, broadcasting, group messages, file sharing etc...

### **6.1 User Side**

No Hidden Cost

Multimedia :- (Send Video, Images, and Voice notes to your friends and contacts)

Group Chat

No need to Log In/Out

No need to add Buddies

Record voice messages.

Know when people have seen your messages.

Status Update

As Open As SMS

And Much More (Share location, Exchange contacts, Custom wallpaper, Email chat history, Broadcast messages)

## **6.2 Developer Side**

### **Hardware Requirements (Recommended):**

60 GB HD

Android Phone (optional)

I-3 or above processor

2 GB RAM

### **Software Requirements:**

Operating System: Windows XP or above, LINUX

Software: Mobile IDE Plugins

Development Tools: Android SDK

Database: SQLite

Minimum requirement API-13

## **7. Feasibility Study**

**7.1 Technical Feasibility:** System will work on android mobile or tablet which requires android 2.1 and up version. Easy to develop application using open source.

**7.2 Economic Feasibility:** This application is developed using open source software. So, there are not any issues related to development tools. After develop this application, we will put it on Google play which is also an open source so user can easily download.

**7.3 Operational Feasibility:** The system will be GUI based so the user will easily understand and no need for training. The system will give fast response. It's a faster way to communicate.

## **8. Other Requirements**

### **8.1 Data Base**

The Application must be able to use several data formats according to the data formats that are provided by the data bases. A transaction should have all the properties of a data base transaction (Atomicity, Consistency, Isolation, and Durability).