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# CONCEPTUAL FRAMEWORK FOR REQUIREMENT ELICITATION IN MOBILE APPLICATION

## DISSERTATION

***SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF***

## MASTER OF TECHNOLOGY

**IN**

## COMPUTER SCIENCE AND ENGINEERING

**BY**

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**LUCKNOW (INDIA)**
**2016**

# UNDERTAKING

I, Bably Dolly , student of M. Tech (CSE), hereby declare that the work detailed in this Dissertation entitled "Conceptual Framework For Requirement Elicitation In Mobile Application" submitted to the Computer Science and Engineering Department, Integral University, Lucknow for the award of the Master of Technology degree in CSE, is my original work. I have neither plagiarized nor submitted this work for the award of any other degree. In case, this undertaking is found incorrect, I accept that my degree may be unconditionally withdrawn.

Date:

Lucknow _____

# CERTIFICATE

This is to certify that the dissertation report entitled **"CONCEPTUAL FRAMEWORK FOR REQUIREMENT ELICITATION IN MOBILE APPLICATION"** has been completed by **Ms. BABLY DOLLY** (Enrolment No. 1300101709) for the award of Degree of Master of Technology in Computer Science and Engineering is a record of confide work and sincere efforts carried out by her under our supervision and guidance. The matter embodied in this dissertation has not been submitted elsewhere for award of any degree or diploma. We found her to be sincere, hardworking and wish her all the success in future.

**Supervisor**

Signature with date

**Dr. M. Akheela Khanum**

**Associate Professor**

(Dept.of Computer Science and Engg.)

Dated:

# RECOMMENDATION

On the basis of the declaration submitted by Bably Dolly student of M.Tech.(CSE), successful completion of Pre presentation on 03/06/2014 and the certificate issued by the supervisor Dr. M. Akheela Khanum, Associate Professor, Computer Science and Engineering Department, the work entitle "Conceptual Framework For Requirement Elicitation In Mobile Application" submitted to department of CSE, in partial fulfillment of the requirement for the degree of Master of Technology in Computer Science & Engineering, is recommended for examination.

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## ABSTRACT

Software Engineering (SE) is one of the most powerful and resourceful building areas growing and creating inside recent decades or somewhere in the surrounding area. Still, an exploration work has gone into forming it the way we see it working today. Therefore, we have a great information vault to work with as programming advancement models, programming designing hypotheses and practices and so on. The point of SE is to make programming items, administrations or their ancient rarities having a definite end goal to meet the requirements postured by stakeholders while meeting quality imperatives forced on them. So as to meet both these goals, any product advancement determines its motivation and importance from the necessities postured by all stakeholders.

In today's scenario Mobile Based Social networking Applications have changed our day to day life and they've the prospective to considerably enlighten and for supportability of Requirements Engineering (RE) Process. The mobile based social network are used to support for Requirement Engineering in which mobile based social networking application (like WhatsApp) have the tremendous advantages to get the end users requirements over the mobile based Social Networking applications are used as light weighted social mobile based application and make the collaboration platforms. In this dissertation firstly we make a survey on existing Social network application and their features which can be consider to be interesting in requirements engineering and after that our main focus on the specific social network applications for requirements engineering that are analyzed and compared based on the features identified in the first step. We will conclude with favorable features which are provided by mobile based social network with reference to useful for requirements engineering and then after by designing a conceptual framework which is capable of empowering the crowd of stakeholders/ end users.

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# CHAPTER 1

# INTRODUCTION

## 1.1 Overview:

Requirements engineering is a critical point in the buildup of application because at this stage the expectation, functionality, and perimeter of the software are supposed to be fully diagnosed, analyzed and defined. It has also been identified that most of the software projects fails to meet the real need are related to requirements engineering areas like capturing, analyzing, specifying, and managing requirements. In some life cycle models [1], feasibility study is the initial activity in the requirement engineering process that results in a feasibility report. If the development of the product is recommended by feasibility report, then requirement analysis can begin. In case of requirement analysis preceding feasibility studies we can expect an outside the box thinking. However, in such a scenario, feasibility should be determined before requirements are finalized.

### 1.1.1 Requirement Engineering Process

Just as software engineering refers to a set of life process activities, requirement engineering in the same way can also be referred to all life-cycle activities that are related to requirements whose bloom activities are gathering, documenting, and managing requirements. Moreover, these primary activities can also be elaborated like elicitation, interpretation analysis, prioritization, designing, structuring, mediation, verification and acceptance, change management, and requirements spotting [2].RE is a multi-disciplinary area that requires excellent communication skills. A wide range of stockholders/users from different backgrounds are needed to communicate effectively so that requirements can be accumulate with desired attributes. Therefore a requirement engineer must have excellent skills to reach out with client as well as strong background of the complication domain.

The objective of this phase is to develop good (not necessarily perfect) requirements and to manage them during the development with respect to risks and quality. The success and failure of this phase plays basic role the success and failure of other coming phases of the software development or implementation.

A software system that meets its proposal to a desired level is conscious as a booming product. The objective of RE is to support the objective that put the remaining software engineering on right tread. The process of RE starts with discovering the goal for which the software system is going to be developed. Once the purpose has been discovered, then stakeholders are distinguished. Not all stakeholders are of same category; therefore they should be classified in groups so that their reactions and requirements are given preference over other when competitions arise. In upcoming section, we shall briefly elaborate upon working of requirement engineering and various models proposed herein.

### 1.1.2 Requirements

It has always been very critical to define and classify requirements in a satisfactory manner. There are several explanations to define requirements. For example, requirements can be viewed as the desired functions that states, how the product should be regarding its functionality, structure, behavior, etc. All projects begin with a statement of requirements.

The widely cited IEEE 610.12-1990 standard defines a complaint as:

(1) A complaint or ability needed by a user to solve a problem or achieve an objective

(2) A complaint or ability that must be met or possessed by a system or system component to satisfy a contract, standard, requirement, or other formally imposed documents.

### 1.1.2 Requirements Engineering

Requirement engineering can be viewed as process of successfully finding and postulating objectives and purposed of the proposed solution. Loucopoulos and Champion (3) define requirements engineering as:

*"*The methodical process of developing necessities complete an iterative process of examining a problem, documenting the consequential clarifications, and inspection the precision of the thoughtful residual*"*

Complaint engineering talking to Lapland (4) is

"A sub discipline of organizations engineering and software engineering that is worried with fundamental the boxes, purposes, and limitations of hardware and software systems"

In their work, Elizabeth External *et al* (5) plan complaint manufacturing as

*"A subset of system engineering concerned with determining, development, outlining, examining, qualifying, communicating and managing requirements that define the system at consecutive points of knowledge"*

All these explosion mentioned above state the environment of RE as a strong component in the software engineering rudiments that has a major subscription in attaining the real-world target. Also, these refer RE a specific description that creates proper framework for condition examination, definition, authentication and confirmation. The definitions, predominantly one, given by Elizabeth Hull(5) also ensures that certain real life facts such as the always evolving nature of supplies and the need to reuse partial condition, as engineers often do in other partitions of engineering. It is actually the same particular distinctive of requirements suggested by Somerville in his work (6) where he states that

"The RE process varies immensely contingent on the type of submission being developed, the size and philosophy of the trades compound, and the software achievement courses used"

### 1.1.4 Requirement Elicitation

Requirement elicitation is a technique of articulate the requirements of users/buyer/stakeholders of an organization/system. Requirement elicitation is one of the techniques of requirement engineering.

**According to IEEE software requirements are described as-**

(1) A condition or capability needed by a user to solve a complication or solve an objective.

(2) A condition or competence that must be met or possessed Standard, specification, or other formally enforced document;

(3)Representation of a document of a condition or competence as in (1) or (2).

Requirements are not limited to the service of the system, as often supposed, but include other facet. There are both functional and nonfunctional requirements in the system.

Requirements are classified as:

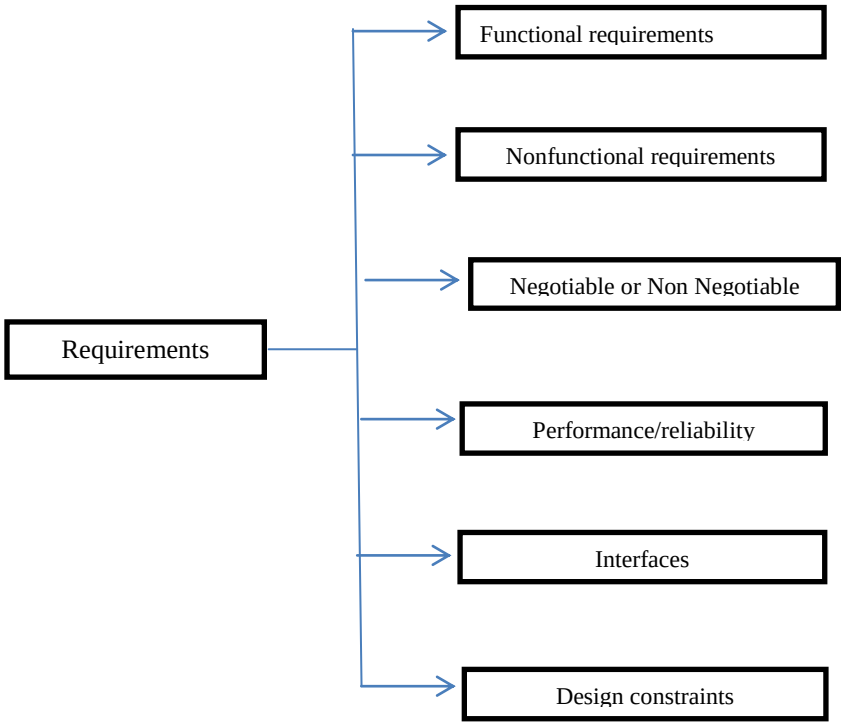


**Fig:1.1 classification of requirements**

Optimization of supplies is the course of getting finest wanted set of provisions. For this purpose several optimization events are used. Countless search based software methods **are** used to Determine the need of users for selecting the Supplies and improve the supplies to get the optimum possible set of requirements. Unambiguous or actual requirements are a most flashy factor that affects the success of a project. Different optimization Algorithms such as meta heuristic search methods like genetic algorithms, simulated annealing and search are used in software engineering problem.

"Supplies elicitation is portrayed as the process of discovering the requirements for a system/association by communicating with customers/scheme users /depositors and others who have Interest in the system".

## 1.2 Background of Requirement Elicitation Process:

The first step in the RE development is the elicitation of requirements. The main goals of requirements elicitation are to regulate what problems need to be solved. It is defined as "the mechanism of Identifying needs and Bridging the disparities among the involved communities

for the objective of defining and distilling requirements to meet the compulsion of these communities". It is served as a front end to systems expansion. Supplies elicitation connections social, outgoing points as well as practical issues. With supplies elicitation, necessities analysts, developers, sponsors, funders, and end workers are complex. The elicitation process is further disintegrating as follows:

1. Identify the origins of requirements. Sources may be an end user, an interfacing scheme, or ecological elements.
2. Gather the wish list for each related party. Originally wish list involves doubts, irregularities, infeasible requirements, and untestable requirements. Also it is imperfect.
3. The wish list for all relevant party is documented and refined. All necessary activities and data are quoted in wish list. The data is repeatedly scrutinized until it is Consistent. Data in list is at tall level. It is stated in user-specific terms.
4. The wish lists are united over various pertinent parties. The conflicts between the
Belvederes are resolute. One more necessary part of this process is consistency checking. Feasibility for wish lists or goals is checked.
5. The non-functional requirements like performance and authenticity are determined. And these are stated in requirements file. These actions are common to most of the mechanism definitions for requirements elicitation raise in the literature.

The resulting commodity from the elicitation phase is a fragment of the goals from the various parties which represent a number of possible results.

Existing requirements elicitation approaches have proven insufficient to record complete,
Consistent, and factual requirements. Studies conducted have shown that 40% of deformity in software projects is due to Unreliable recorded requirements. Eliciting clear, complete, and correct requirements is still a trial and a difficult responsibility in requirements engineering. Indispensable information related to the requirements is often overlooked, and incompletely or not recorded at all during requirements elicitation. Engineers detailing the requirements may misread, partially document, or overlook important statements. Most of the present requirements elicitation methods are clearly lacking abilities to support assembly complete and specific requirements in a natural flow. Our project proposes an open and complete method for requirements elicitation using social networks and obliging filtering. An inherent feature in present requirements elicitation approaches is that they depend on a small amount of experts

such as the requirements contrives or the project team. These experts become a tailback in large-scale software projects where they have to process many requirements from many stakeholders. To remove the block, this work will shift the stress from supplies elicitation involving only the authorities to a helpful approach in which all stakeholders have a say [7].

Requirement Elicitation is a sub process of requirement engineering. Requirement elicitation contain following process-

1. Requirement discover
2. Requirement organization and organization
3. Requirement prioritization and negotiation
4. Requirement specification

Necessities elicitation is the agenda of looking for, revealing, procuring, and explaining fundamentals for PC based outlines. It is by and large understood that necessities are evoked instead of just caught or collected. This infers there are exposé, rise, and progression components to the elicitation process. Requirements elicitation is an intricate procedure including numerous exercises with an assortment of accessible methods, methodologies, and devices for accomplishment them. The comparative qualities and failings of these decide when each is proper relying upon the connection and circumstance [24]. The targets of this part are to show a thorough review of imperative parts of the strategies, methodologies, and instruments for necessities elicitation, and analyze the ebb and flow issues, patterns, and difficulties confronted by analysts and professionals in this field.

For many decades different techniques and approaches are used for requirement elicitation. Some of are as follows-


**Fig:1.1 Requirement Elicitation Techniques**

The significance of necessities designing (RE) inside of programming frameworks advancement has long been built up and perceived by professionals and experts. The elicitation of Requirements speaks to an early however nonstop and basic stage in the advancement of programming frameworks. The necessities for a product framework may be spread crosswise over large sources. These incorporate the issue proprietors, the partners, documentation, and other existing frameworks. On account of the correspondence rich nature of Requirements elicitation exercises, a hefty portion of the viable strategies don't start from the customary ranges of programming designing or software engineering examination. Strategies for necessities elicitation are gotten for the most part from the sociologies, hierarchical hypothesis, bunch flow, information designing, and all the time from viable experience.

The procedure of necessities elicitation is by and large acknowledged as one of the basic exercises in the RE process. Getting the right necessities is considered as a basic yet troublesome piece of programming improvement ventures. A late field investigation of fifteen RE groups completed by Hofmann and Lehner distinguished key RE rehearses that ought to prompt task

achievement. Compelling elicitation of Requirements was seemingly among the most vital of the subsequent suggested great RE hones.

The necessities elicitation procedure includes an arrangement of exercises that must take into consideration correspondence, ranking, transaction, and coordinated effort with all the pertinent partners. It should likewise give solid establishments to the development, disclosure, and innovation of Requirements as a feature of a deeply intuitive elicitation process. Necessities elicitation includes exercises that are seriously informative. These exercises increment in importance when one considers the "way of life crevice" or fundamental semantic contrasts partitioning the issue owning and the critical thinking groups when endeavoring to take part in significant dialog.

At the end of the day there is next to no consistency in the exploration writing and work on concerning the names given to the exercises frequently performed amid necessities elicitation. However what is for the most part acknowledged is that elicitation is the beginning stage inside of the RE process though an iterative and coordinated one.

## 1.2 Objective:

The goal of our research is to investigate whether and how social network mobile applications have the potential to support Requirement Elicitation activities.

## 1.3 Problem Statement:

In this respect we had identified three research questions (RQ)

RQ1: Can a social network mobile app support requirements? If so, how can existing features be used to elicit, end users' requirements?

RQ 2: What are the benefits of using a social network mobile app like WhatsApp approach compared to existing elicitation techniques?

RQ 3: What are the challenges of using a social network mobile app for requirements elicitation?

## 1.4.1 Issues in Requirements Engineering:

Requirement engineering is not an insignificant part of the overall software development activity as is considered by many. Requirement Engineering is quite significant since it needs to cater to number of problems emerging both from the problem domain as well as solution domain. These

covers scope definition, fostering common understanding and sharing among different stakeholders who are directly or indirectly affected by the system, evolving and ever changing nature of requirements etc. If not resolved perfectly, such problems can yield fatal results such as an unsatisfactory product, higher conservation effort, changes or even cancellation. With a degree of renovation in elicitation process, requirement engineering process can be improved. This can result in enhanced system requirements and potentially a much better system. Requirement engineering, as has been highlighted by Elizabeth Hull *et al* [25] can be viewed as a complex and interwoven set of activities such as requirements elicitation, specification, analysis, controlling, management and validation etc. Most of the requirements techniques and tools found in literature and practice today focus on specification, i.e., the representation of the requirements.

## 1.5 Motivation:

Software systems are growing. The raise in bulk extends ahead of simple LOC or come to modules. It can now affect number of end users. In an ultimate earth, huge software systems would at all times do role as planned – users' requirement should be met and clients would acquire worth for their money. Project should always be on time and under the budget. Today's software development is far away from perfect. In large scale software projects are time taking and out of reach for clients. It may be possible not to deliver at some times. Now a days, software development involve huge amount of stakeholders/end users – the individuals or groups that can influence or be influenced by the success or failure of a software project (Nuseibeh and Easterbrook, 2000). These stakeholders include customers who pay for the system, users who interrelate with the system to get their work completed, developers who design, build, and preserve the system, and representatives who impose rules on the development and action of the system (Sharp et al., 1999, Nuseibeh and Easterbrook, 2000). In big projects, stakeholders can cut across divisions and organizations. They have diverse needs, which may conflict.

## 1.6. Thesis Outline:

This thesis consists of 5 chapters and is organized as follows-

Chapter 1 contains Introduction part .After introduction a brief discussion about condition engineering and requirement elicitation has been given. Various approaches for requirement elicitation are also listed in this chapter.

Chapter 2 covers the literature review of the research article published in the field of requirement engineering using the social networking sites.

Chapter 3 describes the methodology that involves process to get requirement elicitation through the social networking mobile applications such as Facebook, Whatsapp etc. to save the time and which is also support to increase the crowd of stakeholders/end users.

Chapter 4 is giving result and discussions of our developed analyzed and implemented methodology.

Chapter 5 is future scope and conclusions.

# CHAPTER 2

# LITERATURE SURVEY

## 2.1 Requirement Elicitation: Social Network in Mobile Application

As Requirements Engineering is used to various fields that have need communication between different stakeholders/end users. As we have several models with reference to Requirements Engineering Process where Requirement elicitation, Requirement analysis and negotiation exists. In the present paper author mostly target on requirement elicitation where, there are some actions after recognizing key investors/end-clients like suggesting, prioritization etc. Social networking has the great effective by growing the number of end users and so to taking the requirements more rapidly to make a great business. In today's constructive media scenario social network plays a vital role to connect peoples anyplace and anytime. Mobile based social network gives mobile holder's user to provide public, semipublic and private profile (e.g. WhatsApp), a list of linked peoples and can share the ideas or anything in the mode of text, voice, video, images.

## 2.2 Literature Survey: RE and Social Network Apps:

Requirements Engineering is that need active communication and interaction between different stakeholders. Some RE tactics and instruments follow these high level models and facilitate step by step guidance and backing (e.g. EasyWinWin [8,9]). Mobile based Social network applications are an example of social software that are used as connecting lots of end users and communicating with others at anyplace and anywhere. Norbert Seyff1, Irina Todoran, Kevin Caluser, Leif Songster and Martin Glinz [10] describes social network apps to draw in a considerable number of heterogeneous, all around conveyed, and possibly unknown shareholder, counting end-users, at the time spent obligation analysis. Along these lines, they adapt to the currently requests for concise time-to-market period and quick, simple, and inexpensive methods. The author proposes a practice including an payment of exercises for requirement elicitation, prioritization, and arbitration, and show how Facebook might strengthen these activities. This is especially valuable when end users are not inside quick reach and it flawlessly coordinates mobile apparatus simultaneously. The authors researched the convenience of the

current elements and they directed three exploratory reviews inside of requirement engineering. Their discoveries determines that end clients could take after the proceeding, communicating their needs, captivating in conversation, and utilizing the Facebook "preferring" highlight for organizing their needs. The concepts show to be supportive and can be further. Bart Hoenderboom, Peng Liang [11] makes a survey on existing semantic wikis and their characteristics, which can be invoked in requirements engineering. Secondly, specific semantic wikis for examining/associating necessities engineering placed on the features analyzed in the first step. Novelist wraps up this paper with actual traits which are available Requirement elicitation, Requirement analysis and arbitration by semantic wikis, and can be helpful for requirements engineering." Nillofer Latheef and A. Alice Nithya [12] says that in the field of software engineering, requirements elicitation is the techniques where stakeholder needs are understood.

A close communication between stakeholders of the system is required for requirement elicitation. As priority based techniques not capable to get recognized and prioritized requirements are not suitable to big projects. Requirements prioritization techniques require substantial attempts from the requirements engineers when there are number of requirements. In large-scale developments, requirements elicitation leads to three impediment: pointless material overburden, insufficient shareholder involvement, and biased prioritized requirements. The model addresses the complications using the following phases - Recognize the large scheme, Study the necessities, diagnose and prioritize stakeholders, Assemble outlines, Foresee requirements and Arrange requirements. The best methods that uses social connections and collaborative communication and percolation to get and arrange requirements. Malicious stakeholders with false recommendations or assessment are careful. For making guesses, author approach will use one of the most well-known algorithms called k-Means clustering algorithm. Finally, the manual proceedings of stakeholder recommendation are automated. The stakeholders refer and connect to another investor, build the communal network environment, and produce prioritization of the requirements. The technique identify and prioritizes a complete set of stakeholders and their requirements automatically and meticulously. These methods outperform the existing methods used in the projects, and require significantly minimum time from the stakeholders and requirements engineers. [12] Xu Kaixuan, Long Yuting‘s article [13] presents

condition, and the direction of mobile social networking business, by analyzing Japan, Korea, Europe and the United States and the more foreign engineers in the mainstream of business oriented development for mobile social application. Then, it summed up the foreign mobile operatives' knowledge of making business oriented mobile communal networking and put forward China's telecommunications operators to set up mobile social networking business, therefore to build up the development of mobile Internet planned thinking. Novelists focus on examining the different features of mobile social networking from source to current situations of mobile based social networking by analyzing diverse countries. And try to measure the role of different characteristics of mobile based social networking in industry and in promotion of development of mobile social network. Dr. Andres Fortino, Aparna Nayak[14] develop social networking services architecture enforced to business purpose and make develop a analysis process for, how technologies are helpful in business environments

Mobile based social network application where every person can interconnect and related to each other with through mobile. As in previous work studied, all talking about the web based mobile application. As the web based social network application, mobile based social network application also exists in virtual world with upgraded properties. Social network has enlightened in the past few years by performing their main role in business forthcoming. There are three main intentions of this paper to investigate whether and how general social system apps have the potential to support RE activities.

1. We will pursuit to discover whether existing components continued by mobile based social applications, for example, Facebook, WhatsApp, Telegram can support in congregation, ranking and transferring client's requirements and next-
2. We notice in what manner and under which circumstances such mobile based social network apps is desirable suitable other over conventional Requirement Elicitation (RE) strategies and then-.
3. We spotlight on issues related to Mobile Based Social Network apps to deal with RE activities[15].

The authors Tarek Ali, Mervat Gheith, Eman S. Nasr shed some light on their research which focuses mainly on end-user crowd-based applications' development. They present the research challenges and project on how SIC can be extended to sustenance the end-user through the whole of the life-cycle of crowd based software Their objective of this paper was to discuss previous tactics to be able to exactly describe SIC surroundings, podiums or technical forms that support end-users to arrange efficient crowd from across the world to work as efficiently as a giant machine. Platforms offer a set of intelligent software design borders which enable end-users to integrate with crowd to manage business rules in a clear and They also presented and defined our vision from the technical and crowd behavior perspectives.[16]

In [17] the authors define Requirements management and prioritization is a complex process that should take into account requirements value for customers, cost of implementation, available properties, rations interdependencies, system construction and addictions to the code base. In this paper authors make put light on how Social Network Examination can be used in order to advance software requirements supervision and the prioritization development. The author's presented model is based on meta-networks where basic entities are integrate for correspond to requirements priorities, interdependencies, required information, etc.[17]

They presented how social network analysis can be used in order to upgrade the process of software requirements management. The introduced model is based on meta-networks where key entities are combined for prioritizing requirements, for specifying subsets and set of requirement whose implementation is combined and as well examples on controlling the required knowledge. The analysis of the model has been illustrated in brief with sample data.[17]

Authors focus on [18] Social networking services that improve communications at the individual level have recently multiplied to the point of short-tempered use. Persons in all society and cultural settings naturally and regularly use Web 2.0 tools such as wikis, blogs and social networking services like as Facebook or LinkedIn, for private purposes. The saturation of these skills into the popular culture has been universal and very successful and tips by far their use at the specialized or business levels.[18]

# CHAPTER 3

# PROPOSED WORK

When going inner about the Requirements Engineering, it is important to begin the idea driving the Engineering. Designing exercises are debased upon the improvement of new Knowledge, new 'made things' or finer approaches for working and doing. Requirements frameworks begin with Requirements elicitation [19]. In this we are trying to show the improved reasonable approach for Requirements elicitation process. This paper at first takes a gander at what research has known about Requirements elicitation and what disregard we have to know. A review is proposed to further our comprehension.[20] Requirements elicitation is the step of getting for innovative thoughts, obtaining, and explaining Requirements for workstation planted frameworks. It is by and big comprehended that Requirements are evoked as inimical to recently caught or collected. This implies there are revelation, growth, and improvement elements to the elicitation process. Requirements elicitation is a strategy including numerous exercises with a mixture of accessible scenarios, methodologies, and devices for performing them. The related qualities and shortcomings of these spotlight when every is fitting relying upon the setting and occurrence. [21] In this paper we just focus on the Requirement Elicitation Concepts through Mobile based Social Networking Apps.

## 3.1. Requirement Elicitation using Social Networking Applications

As Requirements Engineering is used to several fields that requires communication between various stakeholders/end users. As we have different models with reference to Requirements Engineering in which Requirement elicitation, Requirement analysis and negotiation exists. In this paper author often focus on requirement elicitation where, there are many activities after recognizing key stakeholders/end users like devising, prioritization etc. Social networking has the huge effective by collective the number of end users and hence getting the requirements more rapidly to make a great business. In today’s virtual media scenario social network plays an important role to connect peoples anywhere and at any moment. Mobile based social network serve mobile holder’s user to make public, semipublic and private profile (e.g. WhatsApp), a

specification of connected peoples and can segment the ideas, thoughts or anything in the mode of text, voice, video, images, graphics etc.

## 3.2. Previous works: RE and Social Network Apps:

Requirements Engineering is that need active communication and interaction between different stakeholders. Several RE approaches and mechanisms follow these high level models and provide step by step guidance and backing (e.g. EasyWinWin [8,9]). Mobile based Social network applications are an instance of social software that are used as connecting lots of end users and communicate with others at any place and anywhere. Norbert Seyff1, Irina Todoran, Kevin Caluser, Leif Singer and Martin Glinz [10] describes social network apps to draw in a considerable number of heterogeneous, all around carried, and believably unknown shareholder, including end-users, at the time spent requirement analysis. Along these lines, they acclimate to the present requests for concise time-to-market periods and quick, simple, and economical methods. The author proposes a methodology including a settlement of exercises for requirement elicitation, prioritization, and arbitration, and show how Facebook might boost these behavior. This is especially valuable when end users are not inside quick reach and it flawlessly coordinates mobile apparatus simultaneously. The authors researched the convenience of the current elements and they directed three exploratory reviews inside of requirement engineering. Their discoveries determines that end clients could take after the proceeding, communicating their needs, captivating in conversation, and utilizing the Facebook "desiring" highlight for shaping their needs. The concepts show to be supportive and can be further. Bart Hoenderboom, Peng Liang [11] makes a survey on existing semantic wikis and their characteristics, which can be invoked in necessities engineering. Secondly, specific semantic wikis for analyzing/compare requirements engineering placed on the features diagnosed in the primary step. Author wraps up this paper with effective traits which are available Requirement elicitation, Requirement study and settlement by semantic wikis, and can be helpful for requirements engineering." Nillofer Latheef and A. Alice Nithya [12] says that in the field of software engineering, requirements elicitation is the techniques where shareholder needs are understood. A close communication between stakeholders of the system is required for requirement elicitation. As priority based techniques not capable to get recognized and prioritized requirements are not suitable to big projects. Requirements prioritization techniques require substantial attempts from the

requirements engineers when there are number of requirements. In large-scale projects, requirements elicitation leads to three complication: unnecessary information overburden, insufficient stakeholder involvement, and biased prioritized requirements. The model addresses the complications using the following steps - Identify the large project, Analyze the requirements, diagnose and arrange shareholders, Collect profiles, Predict supplies and Prioritize requirements. The best techniques that uses social participations and concerted communication and separation to get and list requirements. Malicious stakeholders with false endorsements or assessment are considered. For making predictions, author approach will use one of the most well-known algorithms called k-Means clustering algorithm. Finally, the manual proceedings of stakeholder recommendation are automated. The shareholders refer and connect to another shareholder, build the social network environment, and produce prioritization of the requirements. The technique identifies and prioritizes a complete set of stakeholders and their requirements automatically and meticulously. These methods outperform the existing methods used in the projects, and require significantly minimum time from the stakeholders and requirements engineers. [12] Xu Kaixuan, Long Yuting‘s article[13] presents condition, and the direction of mobile social networking business, by analyzing Japan, Korea, Europe and the United States and the more foreign engineers in the mainstream of business oriented development for mobile social application. Then, it summed up the foreign mobile operators’ experience of making business oriented mobile communal networking and put forward China's telecommunications operators to set up mobile social networking business, therefore to build up the development of mobile Internet strategic thinking. Novelists focus on analyzing the different landscapes of mobile social networking from source to current states of mobile social networking through examining diverse countries. And try to measure the role of different characteristics of mobile social network in business and in promotion of development of mobile social network. Dr. Andres Fortino, Aparna Nayak [14] develop social networking services architecture enforced to business purpose and make mature a examination process for, how technologies are helpful in business situations

## 3.3. Research Objective:

The goal of our research is to explore whether and how social network mobile bids have the potential to support Requirement Elicitation activities.

There are three main objectives of this paper to inspect whether and how acquainted community system apps have the potential to support RE actions.

1. We will try to discover whether existing components continued by mobile based social applications, for example, Facebook, WhatsApp, Instagram, Telegram can help in gathering, prioritizing and conferencing client's requirements and next-

2. We recognize in what manner and under which circumstances such mobile based community system apps is preferable suitable other over conformist Requirement Elicitation (RE) strategies and then-.

3. We focus on point related to Mobile Based Social Network apps to accord with RE activities [15]

## 3.4. Steps to Requirement Elicitation:

The following are the phases for the steps to requirement Elicitation in mobile application through social networking:-

**Requirements:** Requirements for End Users/ Stakeholders

**Analysis:** Analyse the needs as per Requirements

**Needs:** Comparing the needs with Social Networking

**Quality:** Quality of Performance

**Acceptance:** Acceptance through End Users

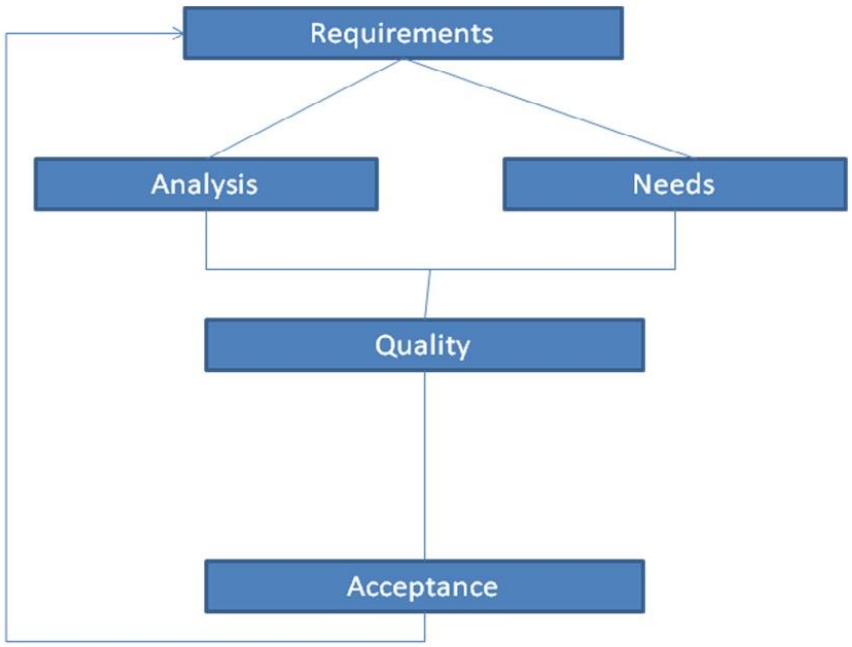


**Fig:1.3 Steps to Requirement Elicitation**

Mobile based social network application where community can communicate and connected to each other with through mobile. As in earlier work studied, all talking about the web based mobile performance. As the web based social network application, mobile based social network performance also exists in virtual universe with enhanced belongings. Social network has progressive in the past few years by accomplishment their main role in business prospective.

## 3.5. RE in $MB^{SNA}$ : A framework

We will try to provide conceptual framework for RE which utilizes the $MB^{SNA}$ through which it can support the RE for empowering the crowd of stakeholders/end users. This conceptual framework encompasses the following –

Initial Requirements – In this will mention the 25 requirements which incorporate the features of $MB^{SNA.}$

Requirement Gathering: For Requirement gathering we prepare a set of questionnaires In this section we have gathered the different availability of requirements in different mobile based social networking applications ($MB^{SNA}$).

Analysis: we try to analyze the whole requirement in the form of responses as Yes or No on the basis of availability of requirements.

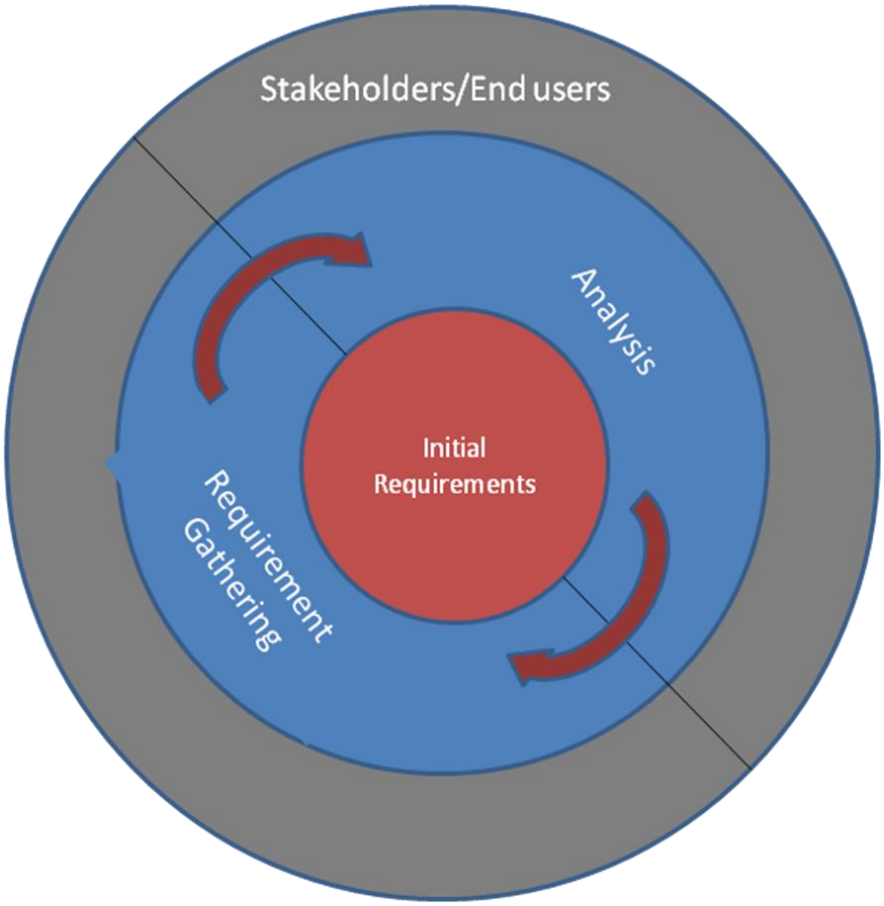


Fig2: Conceptual Framework $CFRE^{MoA}$

The above proposed work is implemented and validated in our next chapter. $MB^{SNA}$ are a broad concept. They refer to mobile services that include user-generated content and the possibilities of communication and networking. Typical examples of $MB^{SNA}$ are Facebook, WhatsApp, YouTube etc. The content types can vary from status updates to user-created videos. Many users participate by sharing, commenting, liking or rating others' content or just watching it. In the literature, social media has a variety of broad definitions, such as Mobile-based tools and

practices enabling participation and collaboration based on individuals' activities, – Tools that people use to share content and to interact, and the process that this interaction and the interlinking of services. User created content means digital content that is produced outside professional routines by "ordinary people", shared with a group of people on a social networking apps. Mobile based solutions that support mutual sharing and open dialogue between users, meaning that people other than the active participants in the letter can also see the shared content or quarrel and can join in. Mobile-based technologies to support interactive dialogue and to introduce substantial and pervasive changes to communication between organizations, communities, and individuals" [23] and hence increase the end user involvement.

# CHAPTER 4

# IMPLEMENTATION

## 4.1. Analyzing Mobile Based Social Networking Applications ($MB^{SNA}$) for RE support

Facebook, Messenger, WhatsApp and Telegram are proud examples of SNA that have millions of users. We select them to become our partakes for an operation of our RE attitude as all are have a several number of registered and active end users - conferring to the figures provided by Alexa. Another criterion was provincial reception – the selected SNA are popular in India. In order to identify the most suitable SNA, the authors performed an initial comparison after defining the key rations for $MB^{SNA}$ supported RE approach. We explored which of their features are used to support the predefined key requirements.

By Our analysis revealed to allow an specific end user's idea (as in table 4.1) – i.e. a requirement, a user's reach (RQ1) all social networks have associated end users for an idea (RQ20, 21). This, for example, includes *like* in Facebook, WhatsApp users are even able to check the access to their ideas (RQ20) by confidentiality and group (RQ23) and hence control the supply of the ideas. Although people could discuss an idea on a user profile, we consider a private, protected and dedicated space for group discussions to be more usefulness (RQ22). Facebook, WhatsApp, Telegram etc. allow their users to create such a space. Those *groups* characterize a steadfast space for argument and communication of new ideas and allow to invite shareholders and manage user settings – e.g. define which group members have to be given permission to access or communicated(RQ23).[10] Telegram is a completely free service while WhatsApp is a yearly subscription program. There are advantages and weaknesses to both approaches. As messages are not stored on the server by this app which gives feeling of high security. [22]

After an initial comparison of the three social network apps, we resolved that three of above would allow us to instantiate and apply our $MB^{SNA}$ System supported RE approach. Although all three candidates (i.e. Facebook, WhatsApp, Telegram) would have satisfied our preliminary requirements, we selected WhatsApp and Facebook to become the platform for further inquiry as

the both are free installed services in inexpensive mobile too which is available the less inexpensive mobile users also. Our main reasons were:

1. Facebook and WhatsApp have over a billion users universal and is currently the important social network app;

2. Target group for our survey (candidate and their networks) would be more likely to already have an account and be familiarized to Facebook, WhatsApp.[10]

| Requirements Serial No. | Requirements |
|---|---|
| RQ1: | Is this app is most popular? |
| RQ2: | Is this App is Free of cost? |
| RQ3: | Can we have Free voice calling? |
| RQ4: | Is mobile number used in Account creation? |
| RQ5: | Is there Message seen confirmations available? |
| RQ6: | Is Automatic backup possible? |
| RQ7: | Is there High Security available? |
| RQ8: | Sending pictures/graphics are easy? |
| RQ9: | Can we transfer videos? |
| RQ10: | can we Send voice messages? |
| RQ11: | is Search function available? |
| RQ12: | Can we Send location data? |
| RQ13: | can we have option to log out? |
| RQ14: | Can we make video calling? |
| RQ15: | Can we Set wallpapers? |
| RQ16: | Is this app provide Notifications? |
| RQ17: | Can we make Secret Chat? |
| RQ18: | Can we make Group Chat? |
| RQ19: | Can we have Broadcast List? |
| RQ20: | Can we Communicate ideas? |
| RQ21: | Can we Comment on given ideas? |
| RQ22: | Can we make Group discusion? |
| RQ23: | Can we Control group access |
| RQ24: | are being get Contact no. in Group automatically shown? |
| RQ25: | Is animation possible? |

**Table:4.1 Checklist for Requirements Elicitation in $MB^{SNA}$**

| | Facebook | WhatsApp | Telegram |
|---|---|---|---|
| RQ1: | No | Yes | No |
| RQ2: | Yes | Yes | Yes |
| RQ3: | Yes | Yes | No |
| RQ4: | Yes | Yes | Yes |
| RQ5: | Yes | Yes | Yes |
| RQ6: | No | Yes | Yes |
| RQ7: | No | Yes | No |
| RQ8: | Yes | Yes | Yes |
| RQ9: | Yes | Yes | Yes |
| RQ10: | Yes | Yes | Yes |
| RQ11: | Yes | Yes | Yes |
| RQ12: | Yes | Yes | Yes |
| RQ13: | No | No | Yes |
| RQ14: | Yes | Yes | No |
| RQ15: | No | Yes | Yes |
| RQ16: | Yes | Yes | Yes |
| RQ17: | Yes | Yes | Yes |
| RQ18: | Yes | Yes | Yes |
| RQ19: | Yes | Yes | No |
| RQ20: | Yes | Yes | Yes |
| RQ21: | Yes | Yes | Yes |
| RQ22: | Yes | Yes | Yes |
| RQ23: | Yes | Yes | Yes |
| RQ24: | No | Yes | No |
| RQ25: | No | No | Yes |

**Table :4.2 Analysis of requirements in different MB$^{SNA}$**

## 4.2. Implementation

| Parameters | Facebook (x1) | WhatsApp (x2) | Telegram (x3) |
|---|---|---|---|
| RQ1: | 0 | 1 | 0 |
| RQ2: | 1 | 1 | 1 |
| RQ3: | 1 | 1 | 1 |
| RQ4: | 1 | 1 | 1 |
| RQ5: | 1 | 1 | 1 |
| RQ6: | 0 | 1 | 1 |
| RQ7: | 0 | 1 | 1 |
| RQ8: | 1 | 1 | 1 |
| RQ9: | 1 | 1 | 1 |
| RQ10: | 1 | 1 | 1 |
| RQ11: | 1 | 1 | 1 |
| RQ12: | 1 | 1 | 1 |
| RQ13: | 0 | 0 | 1 |
| RQ14: | 1 | 1 | 0 |
| RQ15: | 0 | 1 | 1 |
| RQ16: | 1 | 1 | 1 |
| RQ17: | 1 | 1 | 1 |
| RQ18: | 1 | 1 | 1 |
| RQ19: | 1 | 1 | 0 |
| RQ20: | 1 | 1 | 1 |
| RQ21: | 1 | 1 | 1 |
| RQ22: | 1 | 1 | 1 |
| RQ23: | 1 | 1 | 1 |
| RQ24: | 0 | 1 | 0 |
| RQ25. | 0 | 0 | 1 |

**Table:4.3 matrix representation between requirements and $MB^{SNA}$**

| Parameters | Facebook (x1) | WhatsApp (x2) | Telegram (x3) | Weightage (w) |
|---|---|---|---|---|
| RQ1: | 0 | 1 | 0 | 1 |
| RQ2: | 1 | 1 | 1 | 3 |
| RQ3: | 1 | 1 | 1 | 3 |
| RQ4: | 1 | 1 | 1 | 3 |
| RQ5: | 1 | 1 | 1 | 3 |
| RQ6: | 0 | 1 | 1 | 2 |
| RQ7: | 0 | 1 | 1 | 2 |
| RQ8: | 1 | 1 | 1 | 3 |
| RQ9: | 1 | 1 | 1 | 3 |
| RQ10: | 1 | 1 | 1 | 3 |
| RQ11: | 1 | 1 | 1 | 3 |
| RQ12: | 1 | 1 | 1 | 3 |
| RQ13: | 0 | 0 | 1 | 1 |
| RQ14: | 1 | 1 | 0 | 2 |
| RQ15: | 0 | 1 | 1 | 2 |
| RQ16: | 1 | 1 | 1 | 3 |
| RQ17: | 1 | 1 | 1 | 3 |
| RQ18: | 1 | 1 | 1 | 3 |
| RQ19: | 1 | 1 | 0 | 2 |
| RQ20: | 1 | 1 | 1 | 3 |
| RQ21: | 1 | 1 | 1 | 3 |
| RQ22: | 1 | 1 | 1 | 3 |
| RQ23: | 1 | 1 | 1 | 3 |
| RQ24: | 0 | 1 | 0 | 1 |
| RQ25. | 0 | 0 | 1 | 1 |

**Table:4.4 Matrix for Requirement using $MB^{SNA}$ with their weightage**

| Parameters | Facebook (x1) | WhatsApp (x2) | Telegram (x3) | Weightage (w) |
|---|---|---|---|---|
| RQ1: | 0 | 1 | 0 | 1 |
| RQ2: | 1 | 1 | 1 | 3 |
| RQ3: | 1 | 1 | 1 | 3 |
| RQ4: | 1 | 1 | 1 | 3 |
| RQ5: | 1 | 1 | 1 | 3 |
| RQ6: | 0 | 1 | 1 | 2 |
| RQ7: | 0 | 1 | 1 | 2 |
| RQ8: | 1 | 1 | 1 | 3 |
| RQ9: | 1 | 1 | 1 | 3 |
| RQ10: | 1 | 1 | 1 | 3 |
| RQ11: | 1 | 1 | 1 | 3 |
| RQ12: | 1 | 1 | 1 | 3 |
| RQ13: | 0 | 0 | 1 | 1 |
| RQ14: | 1 | 1 | 0 | 2 |
| RQ15: | 0 | 1 | 1 | 2 |
| RQ16: | 1 | 1 | 1 | 3 |
| RQ17: | 1 | 1 | 1 | 3 |
| RQ18: | 1 | 1 | 1 | 3 |
| RQ19: | 1 | 1 | 0 | 2 |
| RQ20: | 1 | 1 | 1 | 3 |
| RQ21: | 1 | 1 | 1 | 3 |
| RQ22: | 1 | 1 | 1 | 3 |
| RQ23: | 1 | 1 | 1 | 3 |
| RQ24: | 0 | 1 | 0 | 1 |
| RQ25. | 0 | 0 | 1 | 1 |
| Total | 18 | 23 | 21 | 62 |

**Table:4.5 Comperative Evaluation of $MB^{SNA}$**

The given designed tabular responses are prepared on the basis of either the given requirement exist or not, these are answered in yes or no format by taking the survey through different 500 end users. In this the requirement is classified as resulted of yes or No reply from survey. For this Yes/No responses we use 1 or 0 indicator. As it can seen, we have give a weight to each requirement, where every requirement have the highest weight as 3 and lowest weight as 0. On the foundation of rquirement weight we can arrange that which requirement have the highest urgency and which one has mediam or low urgency.

**Consideration on the basis of the requirements in the $MB^{SNA}$**

Indicator used:

Yes-> 1

No-> 0

**Degree of requirement parameters(DRP) in mobile apps can be calculated using following formula:**

$$DRP = \sum x_i w_i \qquad \text{for } i=1,2,3,\ldots.n$$

Where,

x is individual apps

w is maximum weight of individual requirement for Mobile App

## Evaluation of Original Degree:

## By using the above mentioned formula the original degree can be evaluated as below-

Original DRP= $x_1*w + x_2*w + x_3*w$

$=18*62 + 23*62 + 21*62$

$=3844$

= Total weight of mobile Application

Calculation of highest degree that is represented in the form of % level

% level = 3844 / 75*75

=68.33

The % level is used to decide that no DRP can be beyond this level i.e. 68.33% is the highest degree of each requirement parameter and no social network app used in this survey cannot be greater than this value. As we can see that the calculated % of each $MB^{SNA}$ have different percentile level as 72% , 92%, 84% for Facebook, Whatsapp, Telegram respectively.

| **Comparison through calculating % of each application** | **Facebook** | **Whatsapp** | **Telegram** |
|---|---|---|---|
| | 72% | 92% | 84% |

## 4.3. Acceptance or validation:

| | **Facebook** | **Whatsapp** | **Telegram** |
|---|---|---|---|
| P value = | 18/25 * 68.33/100<br>= 0.4919 | 23/25 * 68.33/100<br>=0.6286 | 21/25 * 68.33/100<br>=0.5739 |

The individual p value of the mobile app is calculated for Facebook messenger is 0.49,

For Whatsapp is 0.62 and Telegram is 0.57

Since the p value of Whatsapp is high hence we conclude that it is most popular mobile app for requirement elicitation with respect to gathering the crowd.

## 4.4 Result through Graphical representation between Requirements and MB$^{SNA}$:

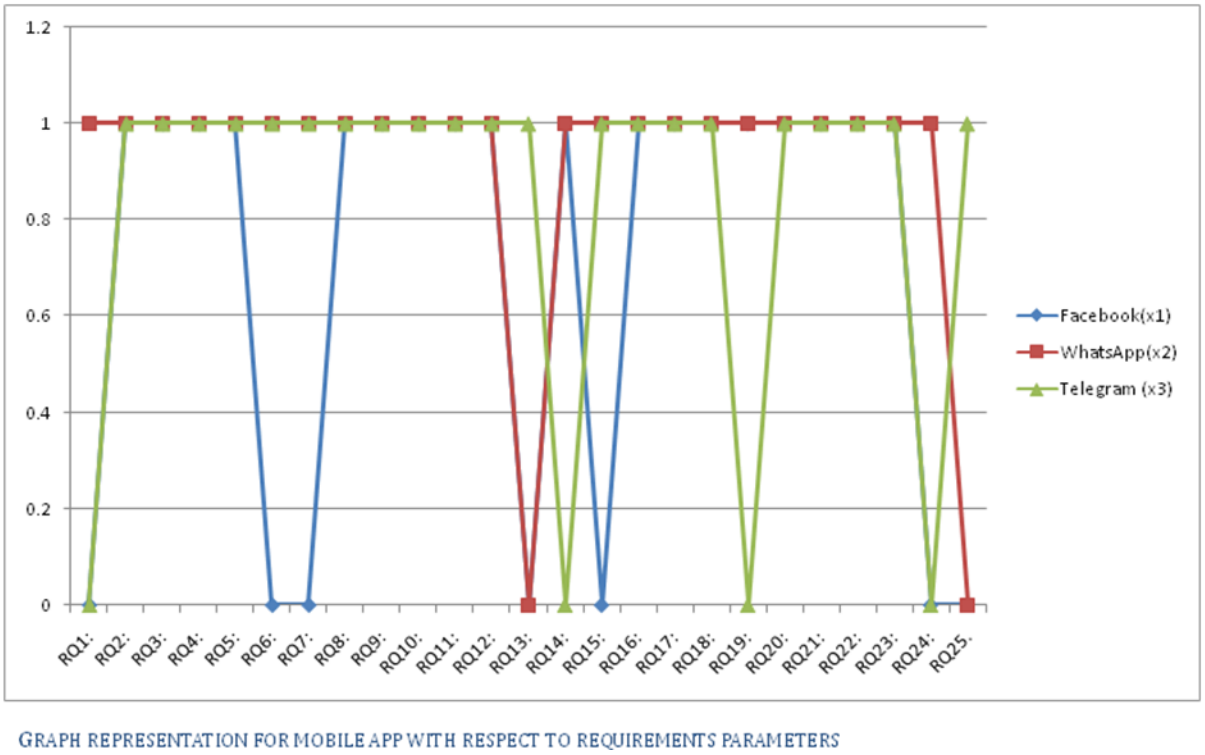


Fig: 4.2 Graph Representation For Mobile App With Respect Requirements Limits

As we can see the consequences from graphical symbol where blue diamonds are indicator of Facebook, maroon square shapes are indicator of Whatsapp and the green triangle shapes are indicator of Telegram social networking mobile apps. By seeing the weight of different applications in this survey, we can conclude that the most popular mobile social networking app is Whatsapp by comparison of their utilization o the basis of their different features where rest are less uses as compare to this app. As a result we can say that Requirement elicitation can be easily done by using the different social networking sites as they are the real factors for empowering the crowd of the stakeholders/ end users.

CHAPTER 5

# CONCLUSION AND FUTURE WORK

## 5.1 Conclusion:

In this paper we have emphasize on the way of empowering the crowd using Mobile Based Social Networking Applications in support to Requirement Elicitation in the scenario of requirement engineering phases in software development. We have analyzed various elicitation techniques and requirement elicitation process using different social networking applications. However, no significant comparative evaluation of these techniques has been made so far. . In this work a new process for requirement elicitation is has been proposed and described. This new process of requirement elicitation is based on social networking site as a mobile application. In this framework stakeholders /end users and experts perform prediction of requirement completeness and understandability. Since the today's scenario is changed by more utilization of mobiles rather than the personal computer or laptop or notebook. Mobile based solutions is the best way to reach the end users more frequently where Social networking apps play a vital role to enrich the end users involvement that support mutual sharing and interactivity, either they are active users or not in a group, are able to communicate and share their ideas to each other. As in different papers says, we conclude that the WhatsApp is more user-friendly and near to end user's reach as compared to others mobile based social apps. As we can see from the implementation results by seeing the weight of different applications in this survey, we can conclude that the most popular mobile social networking application is WhatsApp by comparison of their utilization on the basis of their different features where rest are less uses as compare to this app. As a result we can say that Requirement elicitation can be easily done by using the different social networking sites as they are the real factors for empowering the crowd of the stakeholders/ end users.

## 5.2 Future Work:

In future, we are expecting the use of more intelligent techniques towards requirement engineering such as requirement elicitation using the social network applications etc. We are also investigating the application of different social networking features which can incorporate various elicitation techniques so that the emerging crowd can be engaged in it. Intelligent

techniques can be used to discover ranking factor between different social networking apps for the same requirement and inconsistencies in various artifacts of requirement modeling. Similarly formally specified requirements can be used to effectively determine inconsistencies using intelligent approaches such as ant colony techniques.

A detailed and through analysis of various requirement classification factors need to be performed. The classification factors identified in this thesis are outcome of a scholarly debate for the purpose of this thesis. However, there is need to formulate a framework to determine appropriate classification factors for various types of software products or services. For example, it is quite significant to study the inclusion of usability and user experience of each requirement as classification factor since most of the users are mainly affected by touch and feel of the system before they get affected by functionality. Such a detailed study and framework formulation is one major future work.

Further work is going on in finding new areas of application for intelligent techniques in software engineering. One such area where artificial intelligence using ant colony techniques can be effective used in project management.

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