

# Requirement Validation Method using Social Network Service (SNS)



Neunghoe Kim

**Abstract:** *Low quality requirements contribute to many problems throughout the software development life cycle. For this reason, requirements validation step, a last step of the requirements development, is a very important activity for finding potential problems of requirements and preventing failures. However, in practice, there are a lot of cases that omitted or simply processed. It causes scheduling delays and over-costs, and result in fail in software project. In the requirement validation step, the various aspects of the specific requirements are reviewed, and the one important factor is "Are the functions the user wants included in the specification?" at that time. This can be verified by the opinions of a lot of various users, and the appropriate method is the method to use social network services where users freely post and share their opinions. Interviews, questionnaires that are methods to identify user needs for a long time required a lot of time and costs, but, contrary to that, the identifying user needs through social network services have a characteristics that can identify the needs of a large number of different people at a relatively low cost and time. Therefore, this paper suggested a systematic method of requirements validation using social network services that can identify the needs of a large number of and various users with low cost and time relatively. It is available to check whether the functions desired by user are included in the software requirement specification correctly through this method and, also, prevent the problems caused by low quality requirement.*

**Keywords :** Requirement validation, Social network service, Software requirement development, Software requirement specification.

## I. INTRODUCTION

Low quality requirements can affect not only other well-defined requirements but also later phases and cause follow-up defects in design, implementation and testing. In addition, many problems throughout the software development life cycle are cause low quality requirements [1]. In this respect, the requirements validation is a very important activity and a way to prevent failure, which can find out potential problems of requirements in the requirements development lastly.

However, in practice, there are a lot of cases which is often omitted or simply processed due to the facts that time, money, and effort are taken, and questions about cost-effectiveness, and the illusion that the requirements sufficiently well carried out the elicitation, analysis, and specifications. This results in a scheduling delay and cost over an estimated budget due to finding bugs in the steps later, and lead to a software project failure [2].

At the requirement validation step, the various aspects of the requirements specified through various activities are

viewed, one of which is "Are the functions the user wants included in the specification?" [3]. This matter needs a lot of opinions of users and it can be validated through these opinions, and a good method is that use social network services such as facebook and twitter where users freely post and share their opinions. Social network services are rapidly increasing in number of users as time goes by and many people trusts and refers to information posted and shared on social network services. Identification of user needs in social network services is different from the methods such as interviews and questionnaires that have traditionally been used to identify user needs. While the old methods have limitations that require a lot of time and money, if identify the need through social network services, the needs of a lot of various people with low cost and time relatively. Therefore, this paper intended to suggest a systematic method of requirements validation using social network services that can identify the needs of a lot of various users with low cost and time relatively.

## II. BACKGROUND

### A. Social Network Service

According to [4], it is defined as "A social network service is a web-based service that constructs an individual's profile, shares the connections formed through the relationships between individuals, and supports interactions between individuals that occur on the basis of those connections". It is used in confusion with the online community, but it is that if the community refers to group-oriented community services, where people with similar interest usually gather and work in one place, the social network service is centered on individuals, forming relationships with other individuals, and building up larger networks by accumulating these individual relationships [5]. In the previous paper [6], [7], five SNS functions were described as table 1.

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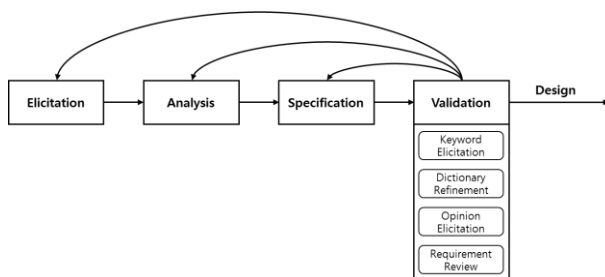
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**Table- I: SNS functions**

Factor	Definition
Expert Search	Function of surfing people who cannot easily meet or who have professional knowledge via SNS
Communication	Function of delivering opinion to others or sharing conversation with friends via SNS
Connection	Function of maintaining relationship with people who have known offline via SNS
Contents Sharing	Function of sharing and dissemination contents like information, music, movies, and so on via SNS
Identity	Function of expressing recent situation, mood, feeling, personality and so on via SNS

## III. REQUIREMENT VALIDATION METHOD USING SOCIAL NETWORK SERVICE

The method proposed in this paper begins its performance in the condition that the initial software requirements specification is completed after the requirement elicitation, analysis, and specification steps, in accordance with the general requirements development procedure. And, after going through the method proposed in this paper, it goes back to one of the requirements development steps according to the deficiencies, or complete the writing of the final software requirements specification if there is no any problem, and move on to software design, a next step.



**Fig. 1. Requirement development procedure.**

### A. Keyword Elicitation Step

The keyword elicitation step is an activity derives the keywords of critical functional requirements from the initial software requirement specification. Because it takes a lot of time and money to verify all functional requirements, it sets functional requirements that need to be verified and derives keywords in the form of nouns that are be a key, based on the importance of the initial software requirement specification. However, since social network services are data that people freely post and share opinions, they should be able to define functional requirements and derive keywords from the user's perspective, which are deemed to be valid and possible, considering that they are the opinions of the users.

### B. Dictionary Refinement Step

The dictionary refinement step is an activity to redefine existing positive and negative words dictionaries because words with positive and negative meanings are changed depending on various conditions. In order that determine the

positivity and negativity of opinions, dictionaries of words positive and negative meanings are readily available on the Internet. However, depending on the domain, market, target, and so on, the positive words can mean negativity, and the negative words can mean positivity. Therefore, it is necessary to redefine activities to add, change, and remove words that determine positives and negatives.

### C. Opinion Elicitation Step

The opinion elicitation step is an activity of eliciting opinions using keywords and positive and negative dictionaries derived earlier from the social network service. Using basic natural language processing (NLP) techniques for opinions of social network services, the natural language of social network services is analyzed according to procedures. It analyzes to determine the positivity and negativity of opinions containing keywords and derives these opinions. If a lot of words with positive and negative meanings are given in the opinion containing keyword, the frequency of positive and negative is assessed to determine the opinion as being high in frequency.

### D. Requirement Review Step

The requirement review step is an activity to review the requirements through stakeholders' discussions based on the results of the opinions drawn earlier. Results drawn earlier derived include keywords for critical functional requirements, which are determined positive and negative. Stakeholders perform a comparison and analysis with the current software requirements specification based on these results. If it is similar to the function of the requirements that are currently written and the opinions related to the requirements is positive, the investment expense can be used to maintain the current function of the requirements or to improve other requirements. However, if it is similar to the function of the requirements that are currently written and the opinions related to the requirements is negative, we will have to consider expanding or improving the function of our requirements and creating new relevant requirements.

## IV. CONCLUSION

This paper suggested requirements validation method using social network service that can identify the needs of a lot of various users with low cost and time relatively. This method composed of total four steps: keyword elicitation, dictionary refine, opinion elicitation, and requirements review to use people's opinions on the social network services in requirements validation. This method allows users to review whether the functions the user wants are included in the software requirement specification, while at the same time, a review of the specification of important requirements can be carried out to prevent problems caused by low quality requirements. It will be of great help to the scheduling delay and the over-cost problem. As a future study plan, although several examples have been applied to suggest how to perform, we plan to apply them in the requirements development step of the actual software development project in future, and verify the effectiveness of this method after the project is completed.

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