

## MYMASJID-REQ Elicitation Model for Eliciting Requirements for MYMASJID Application

Noorihan Abdul Rahman<sup>1, a</sup>

<sup>1</sup>Faculty of Computer and Mathematical Science,  
Bukit Ilmu, 18500 Machang, Kelantan

<sup>a</sup>noorihan@kelantan.uitm.edu.my

**Keywords:** Requirements elicitation, MYMASJID-REQ, community, collaboration

**Abstract.** Mosque is one of the key elements for the development of human capital in a community. The challenge in developing human capital values is to ensure that the information can be distributed efficiently within the community. MYMASJID Requirements Elicitation Model, known as MYMASJID-REQ, is a Requirements Engineering practice that is modelled for improving dissemination of information and knowledge sharing between mosque and the community. MYMASJID-REQ permits community members to contribute their opinions and consensus for producing a guideline to develop collaborative application for attracting community members to expose themselves with any related mosques' activities. Preliminary investigation for eliciting collaborative requirements for MYMASJID development shall be collected to seek for the needs and demands from the community members. By having Joint Application Development (JAD) session during MYMASJID-REQ process, the guideline for MYMASJID collaborative application shall be defined. MYMASJID-REQ can give impact to the collaborative application development process whereby it supports non-technical requirements for Islamic collaborative application. MYMASJID-REQ is a potential process to assist application development platform to develop the application based on the needs from the virtual community.

### Introduction

Requirements elicitation engages negotiation and collaboration activities with stakeholders which will produce a clear basis for a set of requirements that will be used for the system development (Rahman and Sahibuddin, 2013). This results from the frequent interaction and agreement among the stakeholders during the RE process (Coughlan *et al.*, 2003). Requirement elicitation is done to identify solutions for designing and developing a system based on a certain scenario which helps the developer during implementation (Nicovich *et al.*, 2005). Requirements elicitation is a crucial step in the software development process since this activity collects the user's demands by using appropriate gathering techniques which can produce a set of requirement specifications for the developer's reference. The requirements engineer who needs to elicit requirements for a specific proposed software must comprehend the proposed system objectives and how they relate to the user during the software development. Steps in requirement elicitation can be tiresome since a lot of time, commitment, and patience are needed during task completion. This process involves the human factor in order to gain the necessary information to carry out the system development (Rahman and Sahibuddin, 2016).

Therefore, besides identifying only technical issues, soft issues related to the human aspect need to be considered as well (Hayat *et al.*, 2010). In this case, the output of requirements elicitation will be taken to the next stage of the RE process. In gathering requirements for Computer-Supported Collaborative Work (CSCW), the information must be gathered from the appropriate individuals as well as determining how they collaborated in their respective groups (Turner and Turner, 1994). Requirements elicitation is not just a gathering process. It is also a process to better understand the requirements that have been collected by going through the activities with the appropriate tools, techniques, and approaches (Zowghi and Coulin, 2005).

There are massive types of collaborative applications which are being used for disseminating information among the society. The issue of these collaborative applications is whether they can assist the community in developing human capital values. The requirements elicitation model, known as, MYMASJID-REQ, is designed in this project to address the challenge of disseminating information efficiently by providing a set of requirements which can assist developers to develop MYMASJID application. MYMASJID application provides a platform for community members to share their opinions and consensus regarding any related mosques' activities and hence attach themselves in religious activities.

### Overview of Requirements Elicitation

The term 'requirements elicitation process' can be described as iterative paths between activities (Sommerville, 2007) which consists of activities such as information gathering, representation, and verification (Browne and Ramesh, 2002). The iteration of activities has also been described as capturing and understanding the requirements and selection of

specific elicitation techniques (Hickey and Davis, 2004) which is done in order to assess uncertainties, dependencies, requirements, system architecture, and version planning (Deifel, 1999). Another study describes activities of the 'requirements elicitation process' as establishing organizational objectives for identifying general knowledge about where the system should be applied, understanding and gathering information about the system background, organizing knowledge with stakeholder identification, goal prioritization, filtering domain knowledge, and collecting stakeholders' requirements (Cremers and Alda, 2013). Terms such as 'requirements elicitation approach' and 'requirements elicitation technique' can also be described as 'requirements elicitation process (Apshvalka *et al.*, 2009).

#### Description of MYMASJID-REQ

MYMASJID-REQ is modelled based on the requirements elicitation model for the collaborative application. The community members need to participate in giving their consensus for the development of MYMASJID collaborative application. The agreement between designer and the community members yields the same consensus on the non-technical features that is able to attract the community members in the process of disseminating information from mosques. MYMASJID-REQ will be into practice whenever all stakeholders agree to commit to the guideline.

MYMASJID-REQ is modeled based on the requirements elicitation model for the collaborative application whereby the non-technical requirements is the main concern in eliciting the requirements. The community members need to participate in giving their consensus for the development of MYMASJID collaborative application. The agreement between designer and the community members yields the same consensus on the non-technical features that is able to attract the community members in the process of disseminating information from mosques. MYMASJID-REQ is modeled in such a way to assist developer to design the collaborative application that is appropriate to all levels in the community. MYMASJID-REQ will be into practice whenever a all stakeholders agree to commit to the guideline.

#### Possible Requirements Elicitation Model for MYMASJID-REQ

**Requirements Elicitation using the Activity Theory (AT).** This type of requirements elicitation is used to develop the Multiagent System (MAS) in Agent-Oriented Software Engineering (AOSE). In order to identify the social aspects in the MAS, the Activity Theory-Activity Checklist (AT-AC) tool is used to facilitate the purpose, and the Unified Modeling Language (UML) is used to visualize the components involved in the MAS (Davey and Cope, 2008).

Figure 1 illustrates how the tools and applications are used to identify the components involved in the requirements elicitation.

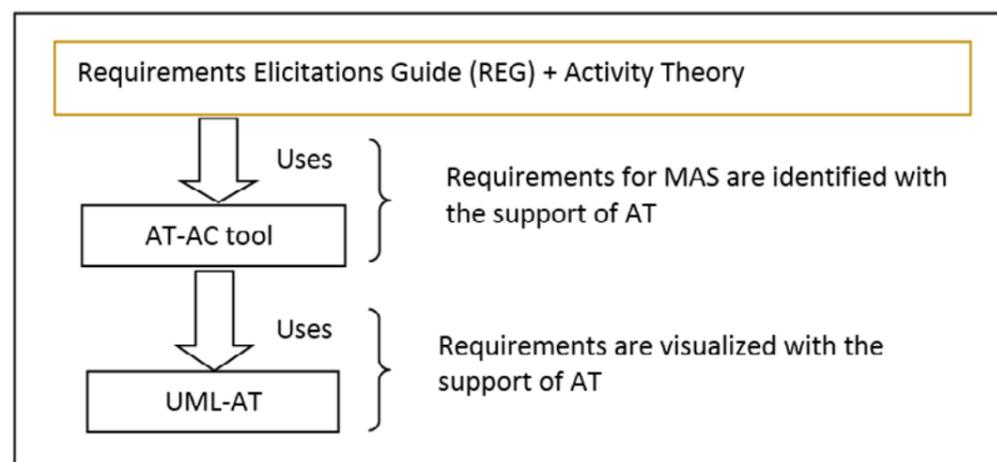


Figure 1: Requirements Elicitation Model Using the Activity Theory

However, there are some weaknesses in the sociological theories like the AT for the software engineering field (Sutcliffe, 2005). According to Sutcliffe, this theory is difficult to use and cannot be generalized to other domains since different case studies might be provided with their own design recommendations from their own information experts. The case study might differ from the MAS and other system environments. Therefore, the AT that is being used in the MAS system may vary with the application of the AT in the E-learning environment.

**Requirements Elicitation using the Collaborative Approach.** The collaborative approach is a process that is used to elicit requirements. This method is used to promote knowledge exchange and negotiation among the stakeholders

(Laporti *et al.*, 2009). During elicitation, the method uses a storytelling approach by converting the story obtained from the stakeholders into a scenario. The scenario is adapted to use cases which are related to the specified story. This approach helps to capture the story and reduce ambiguity from the stakeholders. It replaces the interview and questionnaire technique by having the strength of capturing the story.

On the other hand, the weakness of this approach is that it tends to consume more time in the elicitation process since analysts need to elicit information in the form of a story, upon which they then need to spend a lot of time to analyze it. The research work reported by Laporti *et al.* (2009) did not focus on the types of requirements gathered after the story was refined. The approach might be repeatable if the analyst determines that the information gathered is not sufficient. The stakeholders also have a tendency of providing different versions of the same stories to the analysts which can create conflicts in the requirements elicitation process.

**Requirements Elicitation by Identifying Affective Requirements.** Affective requirements are extension concepts of usability and user experience. They consist of user satisfaction, efficiency, and the effectiveness of the system (Bentley *et al.*, 2002). According to the case study, a set of affective requirements helps to establish computer games that are enjoyable to the users where the specific requirements that have been obtained from the users are clearly defined. Analysts interview computer game users and ask their opinions on satisfaction, efficiency, and effectiveness. In collecting affective requirements, it is important to clearly identify the activities involved in the system because a clear definition of the problem domain will lead to the best fit solution for that particular system implementation.

In producing game applications for computer game users, affective requirements help the developer to identify the emotions that are being put into the game application. Users might not know how to describe the emotional requirements to the developer. Therefore, it is significant for the developer to clearly understand the right methods needed to elicit the social requirements like emotions and refine them as system requirements for the game application.

#### Expected Outcome of MYMASJID-REQ

MYMASJID-REQ has uniqueness in introducing the process for eliciting non-technical requirement mainly for developing collaborative application for mosque as well as improving virtual communication among the community members. MYMASJID-REQ has uniqueness in terms of improving human capital values by introducing the new model for eliciting requirements which is not voluntarily spoken by the community members. MYMASJID-REQ model introduces the process of eliciting non-technical requirements for developing an informative application which acts as a hub for local community. MYMASJID-REQ model provides standard requirements eliciting process to help the community to improve human capital values by assisting the development of non-technical features in the collaborative application. The standard introduced by MYMASJID-REQ is readable by the stakeholders who involve in the collaborative application for mosque specifically. In addition, the model also helps the management committee of the mosque in disseminating and managing the mosque information effectively and efficiently.

#### Conclusion

Based on the unique process of MYMASJID-REQ, MYMASJID collaborative application is plausible to be developed as an Islamic collaborative application. It is an initiative to improve knowledge dissemination for community members. Since most of the mosques carried out similar operations, this system can be further used by other mosques in Malaysia with few modifications to meet each mosque requirements. MYMASJID also has a huge potential to be implemented as a mobile collaborative application.

#### Acknowledgement

The head project member acknowledges support from Universiti Teknologi MARA Kelantan and Masjid Sultan Yahya Petra Machang, Kelantan, Malaysia.

#### References

- Apshvalka, D., Donina, D., & Kirikova, M. (2009). Understanding the problems of Requirements elicitation process: A human perspective. In *Information Systems Development* (pp. 211-223). Springer, Boston, MA.
- Bentley, T., Johnston, L. & Von Baggo, K. (2002). Putting some emotion into requirements engineering. In, 2002. Citeseer.
- Browne, G. J. & Ramesh, V. (2002). Improving information requirements determination: a cognitive perspective. *Information & Management*,39,625-645.

- Cremers, A. B. & Alda, S. (2013). Chapter 5 Requirements Elicitation I Organizational Requirements Engineering.
- Coughlan, J., Lycett, M. & Macredie, R. D. (2003). Communication issues in requirements elicitation: a content analysis of stakeholder experiences. *Information and Software Technology*, 45, 525-537.
- Davey, B. & Cope, C. (2008). Requirements Elicitation- What's Missing? Issues in Informing Science & Information Technology,5,543-551.
- Deifel, B. (1999). A process model for requirementsengineering of CCOTS. In: Database and Expert Systems Applications, 1999. Proceedings. Tenth International Workshop on, 1999. IEEE, 316-320.
- Hayat, F., Ali, S., Ehsan, N., Akhtar, A., Bashir, M. A. & Mirza, E. (2010). Requirement elicitation barriers to software industry of Pakistan (impact of cultural and soft issues). In, 2010. IEEE, 1275-1278.
- Hickey, A. M. & Davis, A. M. (2004). A unified model of requirements elicitation. *Journal of Management Information Systems*,20,65-84.
- Laporti, V., Borges, M. R. S. & Braganholo, V. (2009). Athena: A collaborative approach to requirements elicitation. *Computers in Industry*.
- Nicovich, S. G., Boller, G. W. & Cornwell, T. B. (2005). Experienced presence within computer-mediated communications: Initial explorations on the effects of gender with respect to empathy and immersion. *Journal of Computer-Mediated Communication*, 10.
- Rahman, N. A., & Sahibuddin, S. (2016). Identification of Social Presence for e-Learning: An Initial Multiphase Activities for Requirements Engineering. In *Envisioning the Future of Online Learning* (pp. 227-239). Springer, Singapore.
- Rahman, N. A., & Sahibuddin, S. (2013). A systematic mapping study on requirements elicitation techniques in collaborative application. *Lecture Notes on Software Engineering*, 1(1), 106.
- Sutcliffe, A. (2005). Applying small group theory to analysis and design of CSCW systems. *ACM SIGSOFT Software Engineering Notes*,30,1-6.
- Turner, S. & Turner, P. (1994). Expectations and experiences of CSCW in an Engineering Environment. *Collaborative Computing*,1,237-254.
- Sommerville, I. (2007). *Software Engineering* 8th Edition. (Eight): Addison-Wesley Publishers Limited.
- Zowghi, D. & Coulin, C. (2005). 2 Requirements Elicitation: A Survey of Techniques, Approaches, and Tools. *Engineering and Managing Software Requirements*. Springer Berlin Heidelberg.