Socialization aspect in Requirements Engineering

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Abstract. The role of digital world, information and knowledge in organizations has become increasingly important. Fast changing information systems and requirements ask for fast reactions and rich knowledge about existing solutions. Today's technological development provides new possibilities and new tools that support everyday processes and knowledge management. For example requirements management tools now include even support in collecting knowledge and bring new trends in requirements communication. In this paper the author will provide insight in knowledge management approaches which can support requirement management process and improve knowledge availability, for example, the requirements realization process and the use of requirements results.

Keywords: Knowledge management, requirements engineering, requirements distribution, continuous requirement engineering

1 Introduction

The role of digital world, information and knowledge in organizations has become increasingly important. Fast changing information systems (IS) and requirements ask for fast reactions and rich knowledge about existing solutions. And in case of continuous requirement engineering (CRE), rich knowledge and availability of information (including requirements) becomes increasingly important.

Digitalization brings us more and more possibilities to manage existing data, knowledge and processes. One of the possibilities is socialization. Even in formal environment socialization tools can help collecting knowledge and making decisions and documenting them. Today there are attempts to implement some socialization functionality in existing requirements management tools. For example JIRA [10] system provides possibility to exchange comments between project team members and other involved persons. It also allows collecting knowledge about the implementation process or the results of the implemented functionality and put them into the use.

In the previous paper author describes [9] the information inheritance problem and importance or information availability as well as hypothetical solutions for these problems. In this paper the author will provide insight in socialization aspect which can support requirement management process and improve knowledge availability, for example, the requirements realization process and the use of requirements results.

This paper contains 5 sections: section 1 – introduction, section 2 – related work about CRE and KM, section 3 – Requirements management approach, section 4 – conclusion and section 5 – bibliography.

2 Related work

Requirements engineering (RE) concerns such IS life cycle activities as requirements elicitation, requirements analysis, requirements management and other requirements management activities [1, 2] and tools for requirements documentation. Requirement engineering includes communication too, but it does not describe socialization tools and their use to gather knowledge about requirements process, requirements gathering, the process of approval, requirements realization specifics and use of development results.

Information, data and knowledge is most useful only in situations when it is put to use. CRE concept concerns continuous work on requirements and solutions. Continuous work means reuse of existing requirements and improvement of them in the context of IS changes. The term of CRE [6, 12 is not widely described in research. But some concepts of continuity are already described, for example in SWEBOK (Software Engineering Body of Knowledge) [3] it is pointed out that requirements process is "… initiated at the beginning of a project that continues to be refined throughout the life cycle." In practice the requirements appear before the information technology (IT) project is started before the official start of the project.

BABOK (Business Analysis Body of Knowledge) 3 [2] points out the necessity to plan business analysis information management (requirements capture, storage and integration with other information) in a way that provides long term use. And long term use means continuous work on requirements and the solution as well.

There are some more specific topics too, e.g. model (Model Federation) for CRE to support and propose an approach of model federation that allows information sharing by maintaining dynamic links between different models [15].

Knowledge creation, capturing and diffusion have become important aspects in organizations [13]. Knowledge in all aspects, including requirements management and solution development, is the most valuable asset in organizations [14]. Success of many organizations depends on availability of knowledge, particularly the amount and quality of explicit knowledge. Even the success in RE process depends on the available knowledge. Moreover in knowledge elicitation and requirements elicitation process we can use the same techniques: like interviews, shadowing etc. [2, 10]. It gives us a reason to think about possibilities to adapt KM practices and tools in CRE.

Ruhaya Ab. Aziza, Bernard Wongb [4] talk about the relationship between requirements and knowledge. They describe the importance of the relationship between requirements and knowledge, because "…managing these incremental changes in software development is very challenging. The knowledge and management of requirements changes is crucial in the management of software changes". Ebert and De Man [5] state that knowledge about techniques, project portfolio and processes and information are important in continuous systems and requirement improvements.

We can talk about knowledge only if we have gathered some knowledge. And last year there was some research done on usage of today's social messaging (SM) tools in enterprises [16] in context of knowledge elicitation and management. It can be one of possible ways to support knowledge elicitation and transformation into written form in a natural way. The only aspect worth considering is how structured and analyzable this information is.

Social messaging [16], Internet of Thing and Cloud technologies [13] and socialization tools is the latest trend in KM solutions. Solutions as Facebook and WhatsApp and others bring new possibilities and ideas about the ways of knowledge elicitation and management in organizations. Today the business decisions have to be made on the move. And applications as WhatsApp and others support this style of work.

In [15] authors talks about KM role in risk management. And Matti Mäntymäki and Kai Riemer talks about enterprise social networking [17] and the role of it. In [17] researches are described that reveal that social networking in enterprise for professional purposes can improve everyday communication and is positively associated with employee performance.

There are some studies about challenges in Requirement Engineering: S. Besrour, L. Bin AB Rahim and P.D.D. Dominic describe such challenges as poor communication during requirement elicitation, undocumented relations among requirements and stakeholders, requirements inconsistency and others [18].

Requirements engineering is strongly related to communication and knowledge. Today's tools for RE and software development support include some option for socialization (online communication, discussions, sharing etc.).

3 Requirements management approach

This section of the paper describes the model of approach of managing requirements in a way that involves socialization possibilities with the purpose to provide knowledge and requirements.

Nowadays the biggest focus in IS projects is mostly put on fast product delivery but there are no assumptions on future work with requirements. If we lack an effective approach for requirements management and distribution, this can result in incomplete requirements, outdated requirement versions and missing information and knowledge.

Many approaches and possibilities in knowledge management and distribution are described in literature. For example requirement distribution can be equivalent to knowledge management, because it includes a whole set of methods for knowledge distribution [7]. There are some assumptions about recommendation tools and their effort in requirement engineering and distribution [8], but this requires good quality of requirements. For example, lack of requirements quality can contribute to bad practice in RE.

Author proposes an approach describing the key principle that can help make requirements distribution more effective and even make requirements management simpler. This approach in early stage havs been adapted in a real company. The validation of results will be shown in next research papers.

The basic idea of the approach is: by reducing the number of requirements management tools and channels we can reduce resources (time resources) for requirement management and simplify communication management (communication mostly is organized trough the tool and all communication is documented). This includes the knowledge elicitation and management activities by using tool support for communication and socialization.

This simple idea can be shown as a model of requirement management approach (see Figure 1).

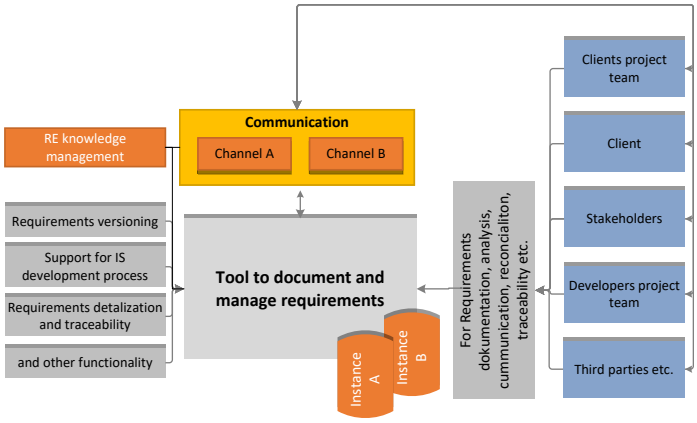

Figure 1 Model of requirements management approach

Shown model of requirements management approach illustrates the key concept – less tools, multi-functional options for communication and socialization, traceability, search, accessibility possibilities, versioning and traceability support, developments process support and other functionality.

If we make a mathematical comparison: for example, 2 organizations, each of which have 2 tools for requirements input. We can assume that the requirements input in each tool requires the same time – X. Then the cumulative time = number of tools*2*X. When the number of tools is minimized, it reduces the total time spent on requirements input. It can save an hour a day or even more.

The next aspect is time that the involved persons spend on search in documented communication process and linking to requirements. If we assume that most of communication and socialization activities are fixed among requirements, it can save us time for searching in different sources and linking them. Of course, the effectiveness depends on quality of the written communication.

This model of RM approach brings restrictions or rules such as the need to ensure of the use of tool from all involved persons and the need to provide availability of tools to all involved persons.

As a result of such approach we can gain more data and knowledge related to requirements. Figure 2 shows the illustrated requirements relations to socialization results.

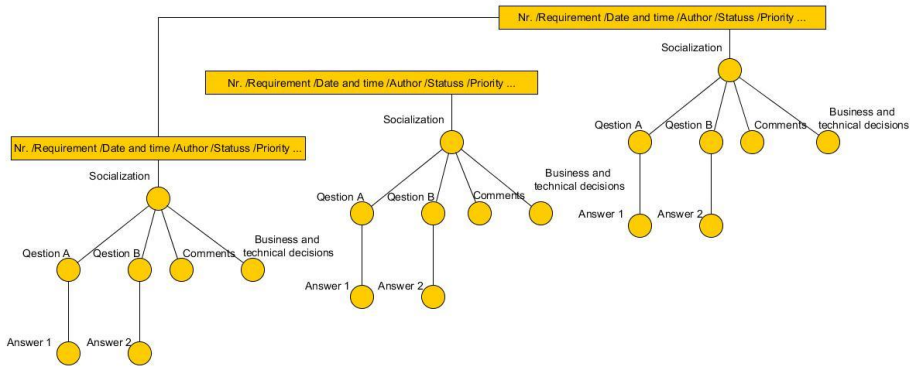

Figure 2 Requirements and socialization possibilities

Requirements usually are stored in "requirements register" – it can be in MS Word, MS Excel or other type of system. And usually contains requirements and their attributes like author, priority, number, date of requirements capture, status etc. Socialization possibilities can bring a new way of requirements management.

Socialization means that requirements have a new attribute – comments, questions and answers, documented decision process. This information can be transformed into knowledge – knowledge about real business processes related to a certain requirement, knowledge about real use of functionality which includes a particular requirement, knowledge about requirements elicitation history and process, and other information. In this case in Figure 2 we can see that this approach links several aspects starting from requirement to socialization results and even knowledge.

Likewise, this model of RM approach shows that we need to think about the relation of requirements to aspects like knowledge and documented communication. The efficiency of this approach will be tested in a real organization and the result of these tests will be described in the following research papers.

4 Conclusion

Mostly IS development projects involve more than one project team and persons. If that is the case, challenges in requirement management and distribution are unavoidable because in most cases each project team uses their own tool and communication channel.

Requirements management and distribution needs to be smart and sustainable, and that means we need to think about the ways of requirement storage and the convenience of their use, and of course – whether the requirements distribution is timely organized. It is critical if a need arises to use these requirements during all of the IS life cycle.

Proposed approach points out the need for small amount of requirement management tools and sets rules for effective requirements management and communication, e.g. – all involved persons use the selected tool (tools) and all tools contain the same version of requirements.

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