The power of dark silicon

Daniel Paredes

FH Dortmund,

Abstract. Sit amet mauris. Curabitur a quam. Aliquam neque. Nam nunc nunc, lacinia sed, varius quis, iaculis eget, ante. Nulla dictum justo eu lacus. Phasellus sit amet quam. Nullam sodales. Cras non magna eu est consectetuer faucibus. Donec tempor lobortis turpis. Sed tellus velit, ullamcorper ac, fringilla vitae, sodales nec, purus. Morbi aliquet risus in mi.

Keywords: hope, luke, ewoks

1 Introduction

I need an introduction...

2 Using Argumentation to Explain Ambiguity in Requirements Elicitation Interviews

One of the major causes of ambiguities in elicitation interviews is the prescense of tacit knowlegde. In some cases ambiguities can't be always be explained as separated term, sometimes it is required to have a context. Even under these circunstances, the analyst must be able to identify and alleviate them in order to elicitate relevant information of the system. For this purpose it is necessary to provide the analyst with proper tools. In this paper Yehia Elrakaiby et al. [1] proposed a theorical framework to overcome ambiguity during interviews in the elicitation phase. The framework is based on the "Argumentation theory".

In that sense, Elrakaiby et al. focus on one type of ambiguities, the "acceptance unclarity". An acceptance unclarity occurs everytime the analyst is able to assign an interpretation or meaning to the speech fragment of the stakeholder, the interpretation matches the intended meaning of the stakeholder, but the interpretation is not acceptable or justified. It could be either because it seems to be inaccurate to comprehend the problem, or analysts identify inconsistencies with their current understanding of the problem or domain knowlegde. By using argumentation theory framework, statements and ambiguities can be characterized as "arguments" and "attacks" respectevely.

Argumentation theory models a type of human dialog based on arguments and conclusions. It makes explicit attacks between arguments and the argumentation flow that leads to conclusions. A basic model in this framework is a pair (A, D), where A is a set of arguments and D is a set of attacks among those arguments. For example, a set A is defined as $A = \{A1, A2, A3\}$, and a possible set of attacks could be $D = \{(A1, A3)\}$. Which means that if A1 is realizable then A3 can't be realizable.

In the paper, Elrakaiby et al. models statements given by the stakeholders, analysts domain knowlegde and analysts inferences as arguments, and ambiguities between them as attacks. For example, let say the analyst listens the following statement *the professor will upload the task description within three days* (A1), but the analyst know (domain knowlegde) that *the professor may be on a business meeting* (A2), so the analyst think (inference) that *it may be possible that it will be take longer to upload the task description* (A3). In this scenario the set of attacks D is given by $D = \{(A1, A3)\}$. Thus, since there is an attack it is possible to ask for clarifications or details.

The theorical framework proposed by Elrakaiby et al. allows analysts to detect and minimize ambiguities during elicitation interviews, while most of the methods that focus on ambiguities analyze written texts. On the other hand, this framework focuses in more complex ambiguities that cannot be view as single terms.

3 Effect of Domain Knowledge on Elicitation Effectiveness: An Internally Replicated Controlled Experiment

The effectiveness of elicitation interviews may be influenced by analyst skills or characteristics. In these high intensive oral communication scenario the analyst must be able to draw out relevant information and needs from the stakeholders. It has been reported that the effectiveness of the interviews has a direct relation with the domain knowlegde of the analyst. However, there are also studies suggesting that in somecases the domain knowlegde have negatives effects in the effectiveness of interviews.

In this paper [2], Aranda et al. studied the influence of the analyst domain knowlegde on the effectiveness of elicitation interviews. The main question they tried to answer was

Does analyst domain knowledge influence (either positively or negatively) the effectiveness of the requirements elicitation activity?

For this purpose, the authors performed the study in two stages. They performed an initial baseline experiment with two domain problems, and then they performed an internal replication with two other domain problems. Furthermore, the authors divided the elicitation process in two phases. The elication phase which is the

actual interview with the stakeholder, and the reporting phase in which the analyst understands and documents the information gathered in the elication phase.

One remark of the study is that the authors chose students because of their lack of experience in eliciation interviews, isolation of the domain knowledge, and to analyze, in the internal replication, the influence of the training in requirements engineering in eliciation interviews. In the study participated post-graduated students as interviewers and two professors as interviewees. The students should make open interviews and elicitate the information afterwards. Moreover, for each domain problem the students were separeted in two groups based on their level of domain knowlegde, *domain-aware* and *domain-ignorant*. On the other hand, the effectiveness of the elicitations was based on the comparison between the number of concepts, processes and requirements elicitated by the students and the benchmarks.

The results of the baseline experiment suggest that the domain knowlegde of the analysts has no significant influence in the effectiveness of the elicitation interviews. However, the results also suggest that the domain knowlegde of the interviewees has statistically significant influence. Supplementary, the results of the internal replication also suggest that the domain knowlegde of the stakeholders is more relevant than the analysts', in term of effectiveness of the elicitation interviews. Nevertheless, these results also show that the possitive effects of the training in requirements engineering of the interviewers, with these effects beiang as relevant as interviwees' domain knowlegde.

4 Requirements elicitation: Towards the Unknown Unknowns

Abstract—Requirements elicitation research is reviewed using a framework categorising the relative 'knowness' of requirements specification and Common Ground discourse theory. The main contribution of this survey is to review requirements elicitation from the perspective of this framework and propose a road map of research to tackle outstanding elicitation problems involving tacit knowledge. The paper concludes with remarks on the possibility of elicitation tackling the most difficult question of 'unknown unknown' requirements.

However, elicitation still remains problematic; missing or mistaken requirements still delay projects and cause cost overruns in this paper we set out to explore the field from the perspective made famous from Donald Rumsfeld's quote of the "known knowns, the known unknowns, and unknown unknowns". This perspective poses challenges to requirements elicitation since it probes the boundaries of knowledge and who possesses it, thereby creating a useful stress test for requirements elicitation techniques, methods and tools.

Elicitation review framework (ERF). Tacit knowledge taxonomy based on the properties of *expressible* (know knowledge), *articulated* (documented domain knowledge), *accesible* (need memory recall), *relevant* to the project: • Known knowns: expressible, articulated, and relevant. • Known unknowns: not expressible or articulated, but accessible and potentially relevant. • Unknown knowns: potentially accessible but not articulated. • Unknown unknowns: not expressible, articulated or accessible but still potentially relevant.

From the perspective of the analyst/ stakeholder: - Known knowns: not a problem - known unknowns: the analyst has a domain knowlegde but the stakeholder may forgot or be unaware - Unknown knowns: the stakeholder holds a knowlegde but it is not articulated, so the analyst has to discover this tacit knowlegde and elicitate it. Once the stakeholder shows a glimpse of his knowlegde the analyst realize that there is something and the problem into known unknowns. - Unknown unknowns: the analist and the stakeholder are unaware of what's missing, but it has the potential to be relevant information.

The Tacit Knowledge Framework [14] poses three challenges: (i) Identifying tacit knowledge: the unknown knowns; even when the analyst suspects they exist (known unknowns), making tacit knowledge accessible may not be easy. (ii) Knowing what is relevant and should be articulated from the analyst's perspective: the necessary detail problem. (iii) Articulating the knowledge where it is needed, in the correct context, so it can be understood by all stakeholders.

The first step to solve the problem of unknown unknowns is to assume that may exist a missing knowledge, and being prepared to invest in order to find it. The goal is to convert the unknown unknowns into known knowns.

Common ground theory explains how meaning is constructed by conversation and action, which progresses towards a mutually agreed goal.

Action Ladder and Project: Meaning in conversations has different layers: the surface of explicit expression, tacit knowlegde and linguistic interpretation. Setting: where the conversation takes place (time, location, domain knowledge) Arena: shared knowledge about the culture, norms, history and assumptions which allow dialogue between people to be interpreted in their context.

For our purposes, Common Ground contributes 'tools for thought' which can address the unknowns problems. For example the Arena suggests questions to discover more detail of the users' background which may uncover unknown concerns (viz cultural, political issues);

For many techniques the ability to detect the known unknowns depends on the analyst's plan and the sampling strategy. In the case of interviews the ability to dectect unknown unknowns depends on the follow-up questions and sample size. Also interviews since they depends on natural language communication there is always the possibility of ambiguous interpretations.

Interviews approach natural human conversation so they support the dynamic construction of understanding and exploration of the Arena and Setting of the

dialogue by explicit questions and observation. However, interviews are weaker for reflection(reflection as an intentional, active progression of learning), where the analyst has to rely on notes and recordings. Furthermore, eliciting tacit knowledge depends on the analysts' questioning skills interaction. Hence a combination of techniques rather than structured interviews per se is probably the most effective approach. .

There are four research directions to push the boundaries of the unknown: Unknown knowns. The problem for the analyst is discovering what the stakeholder knows but does not articulate. Sensitivity to political issues, user values and emotions needs to be researched in depth to provide 'emotional intelligence' guidance for analysts so they can anticipate these unknowns and elicit sensitive tacit knowledge. The Common Ground quest is to be more sensitive to the stakeholder's Setting, feelings, norms and culture

Known unknowns. In this case the analyst has some awareness of the necessary knowledge, so an agenda for elicitation can be set. Most techniques involve exploring the implications of the system-domain boundary. Challenging assumptions, reasoning about the implications of obstacles, and relaxing domain constraints need further research towards not only hard influences, but also soft, probabilistic implications.

Design discovery. This is a variant of known unknowns where the challenge is to solve the "I'll know what I want when I see it" problem. Much progress has been made in this area with prototypes, storyboards and mock-ups; however, simulations and virtual worlds may have further potential.

Unknown unknowns. Two approaches could address elicitation of 'over-the-horizon' knowledge. First, creative RE, which is already established [55], needs to be integrated with social media, so that collaborative creative RE is empowered. This could involve designing socio- technical elicitation systems, as e-communities, communities of practice with global distributions for the increasing number of Internet applications. Secondly, the use of analogies and examples, and also counter examples, can challenge the boundaries of the possible to develop new design ideas.

Known unknowns imply the need for exploration of the problem and solution spaces; (e.g.) using a combination of obstacle anaylsis and prototyping.

5 What i'll do

Explain acceptance unclarity Explain Dung's framework Explain ASPIC+ Inconsistencies It's higly influenced by the domain knowledge of the analyst

5.1 My idea

knowledge domain has influence analyst domain knowledge is statiscally relevant analyst training is even more relevant influence of tacit knowlegde in interviews

ambiguity in interviews - focus on interviewer must have domain knowledge what i want to do is : possible beneficts in requirement elicitaiton is usings two techniques based on the domain knowledge of the analyst, sometimes it is good to have an expert and an ignorant of a topic .

limitations of the technique based on domain knowlegde and tacit knowlegde. how types of tacit knowlegde may influence in the proposal theory how domain knowlegde may influence in the proposal theory

As an intro: analyst domain knowledge is statiscally relevant analyst training is even more relevant focus on the technique from the perspective of knowlegde and technique future of that technique to solve more complex problems, from the prospective of knowlegde and technique

References

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