Communication of requirements within projects

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Abstract

This is a bachelor thesis on how requirements are communicated within projects at IKEA IT Delivery and if a common requirement tool can facilitate the communication.

The question formulations of the thesis were:

- How are requirements communicated within projects at IKEA IT Delivery?
- How can a common tool facilitate or aggravate the communication of requirements at IKEA IT Delivery?

To see patterns in how the tools were used and to answer the thesis question formulations qualitative interviews and a quantitative survey was done.

The survey showed that 69% of the project members used more than one tool to manage requirements this although that project members, both in the survey and in interviews, stated that the use of only one requirement tool facilitated the project members' work and the communication of requirements.

Word was the most used tool to manage both IT and Business requirements but the project members who only used one tool and then Quality Center was the most satisfied.

Quality Center with its features like the possibility to link requirements to each other and tests, have all information such as requirements, tests, defects and releases regarding a project in one place, to see who has changed what and when and get an e-mail when changes are done facilitated the communication of requirements.

With this as background the author only sees advantages with projects using Quality Center as the one common tool.

Keywords: requirements communication, requirement tool, Quality Center, IKEA

Sammanfattning

Detta är ett examensarbete kring hur krav kommuniceras inom projektgrupper på IKEA IT Delivery samt om ett gemensamt kravverktyg kan underlätta denna kommunikation.

Uppsatsens frågeställningar var:

- Hur kommuniceras krav inom projektgrupper på IKEA IT Delivery?
- Hur kan ett gemensamt kravverktyg förenkla eller försvåra kommunikationen av krav på IKEA IT Delivery?

För att hitta mönster i användandet av kravverktyg samt för att besvara uppsatsens frågeställningar genomfördes kvalitativa intervjuer och en kvantitativ enkät.

Enkäten visade att hela 69 % av projektmedlemmarna använde mer än ett verktyg för att hantera IT respektive Business krav. Detta trots att projektmedlemmarna ansåg att användandet av endast ett kravverktyg skulle underlätta deras arbete.

Word var det mest använda verktyget för att hantera båda IT och Businesskrav men de projektmedlemmar som var mest nöjda var de som endast använde ett kravverktyg och då Quality Center.

Möjligheten att koppla krav till varandra och test, samla all information så som krav, tester, releaser och defekter på ett och samma ställe, att se vem som ändrat vad och när samt att få ett e-mail när en ändring gjorts var några av de fördelar som projektmedlemmar såg med att använda Quality Ceneter som det enda gemensamma verktyget.

Med detta som bakgrund ser författaren endast fördelar med att projekt använder ett gemensamt kravverktyg och då Quality Center.

Nyckelord: kravkommunikation, kravverktyg, Quality Center, IKEA

Foreword

This bachelor thesis derives from IKEA IT Test Center's wishes to analyse Quality Center's advantages and disadvantages as a requirement management tool compared to other tools used at IKEA IT.

The author has been located, on site, at IKEA IT Helsingborg and the work has been done in collaboration with personnel and consultants at IKEA IT.

I would like to thank my mentor Fredrik Hjorth for invaluable support, help and feedback throughout the whole thesis process. I would also like to thank Magnus Björk who explained the new structure for Business Analysts at IKEA and Gustav Axstrand who held an education in ClearCase and ClearQuest's functions and features.

Special thanks also goes to Test Center's project members for showing interest in my work and making me feel welcome at IKEA IT, my mentor and examiner at LTH Christin Lindholm for valuable discussions and to my fellow students Marcus Hammar and Ricky Djerf for inspiration and encouragement.

Last but by no means least I would like to thank all project members who provided the thesis with input both through participating in interviews and answering the survey.

Rebecka Helgesson

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1 Introduction

The thesis is a bachelor thesis on how requirements are communicated within projects at IKEA IT Delivery foremost in Helsingborg. In literature found focus often is communication of requirements between stakeholder and requirements analyst. This thesis focuses on the communication within the supplier's organisation and if a common requirement tool can facilitate the communication.

1.1 IKEA

"At IKEA our vision is to create a better everyday life for the many people. Our business idea supports this vision by offering a wide range of well-designed functional home furnishing products at prices so low that as many people as possible will be able to afford them." (www.ikea.com, 2012-02-16). IKEA want to make home furnishing available to everyone. To enable this IKEA is a much larger organisation than customers may realise. IKEA do not only have a number of stores around the world but also a large IT organisation called IKEA IT or IKEA IT Delivery. Their role is to "efficiently manage the information flow to develop and support the growing IKEA" (IKEA Inside 2012-05-02). IKEA IT supports e.g. the stores, warehouses and trading offices with IT tools to facilitate their everyday work (IKEA Inside 2012-05-02).

1.1.1 IKEA IT

At IKEA IT's office in Helsingborg over seven hundred people work with IT solutions and in Älmhult there are another couple of hundred people involved. In addition to these locations IKEA IT has offices in Wallau, Dortmund, Philadelphia and Shanghai. In the last couple of years IKEA IT has experienced a series of reorganisations resulting in that project members no longer are located in the same building or even in the same country. Almost all application development is transferred to other suppliers but the management remains within IKEA IT. This puts high demands on project members' ability to communicate. In addition to this change the management has also experienced reorganisation. Up until September 2011 it was the Business Analyst at IKEA IT Delivery who was responsible for requirements (Björk, 2012-03-08). Depending on the Business Analysts experience from IT requirements the requirements were not always specified which complicated the work for developers who sometimes had to interpret the requirement before implementing the function. In the new organisation the Business Analyst is still identifying and specifying business requirements but they are no longer a part of IT Delivery but IT Demand and the Business organisation instead. In the new organisation the Business Analyst only describes business requirements and it is IT Solution Analyst (ITSA) role to manage and add IT requirements, complementing the business requirements (Björk, 2012-03-08).

Depending on the type of project and what the project management or project members' decides the specification is done differently and the specified requirements are managed with different tools. Common for all projects is that the communication of requirements has become more important especially since it is not possible to verbally communicate requirements as easy due to outsourcing.

To manage and communicate test related information IKEA IT Delivery uses a test management tool named Quality Center, Hewlett Packard (HP). When the process of the thesis started IKEA IT Delivery did not have a recommended requirement tool but during the writing of the thesis IKEA IT has made a decision to make Quality Center not only the recommended tool for testing but for managing requirement and defect well.

1.2 Communicate requirements

There are much literature on requirement elicitation and how requirement analysts can communicate requirements with stakeholders. Alexander & Stevens (2002) and Lauesen (2002) both write about different ways to capture requirements from stakeholders and minimizing the risk of misunderstanding between stakeholder and requirement analyst. But in a project it is not only the person responsible for the requirements that needs to know and understand the stakeholder's requirements. According to Eriksson (2009, p. 28) many companies aims for the structure were requirements are collected from different roles at the customer side via a requirement analyst to the different roles on the supplier side, seen in Figure 1.

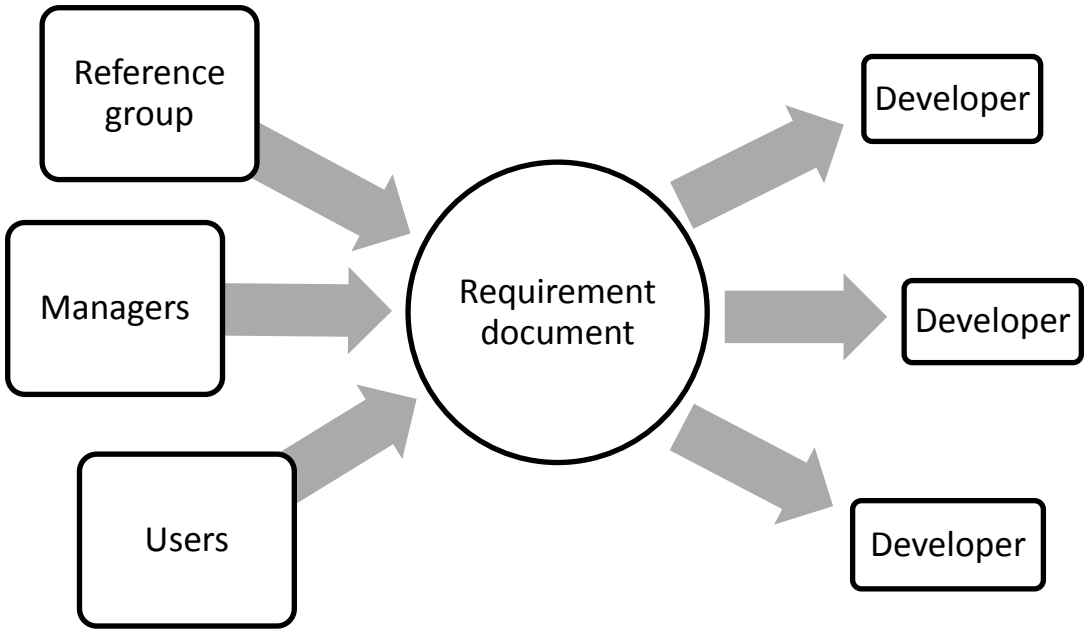

Figure 1: Requirements way from costumer organisation to supplier organisation, inspired by Eriksson, 2009, p. 28

This indicates that also project managers, testers, developers and every other role involved in the project must understand and have access to the requirements. Bjarnason (2011, p. 37) means that communication is an essential part of software development and its efficiency throughout the project is a key factor for successful software products. In the paper "Requirements are slipping through the gaps" Bjarnason states that requirement communication starts with the costumer and continues throughout the project group. The paper highlights the importance of communication between requirement engineers, developers and testers. If there are communication gaps Bjarnason (2011, p. 37) means that this can lead to quality issues, wasted effort and failure to reach the costumers expectations. All interviewed in Bjarnason's study (2011, p. 40-42) meant that the projects size impacted both the communication and agreeing of requirements which could lead to e.g. quality issues, wasted effort, test scope mismatch and that costumers expectations are not met.

An aspect of communication that neither Eriksson's figure (Figure 1) nor Bjarneson's study mention is the communication back to the costumer organisation, the validation of the requirements. Lauesen (2002) means that it is quite common that this step is forgotten and this might result in a disappointed costumer and could be very expensive.

1.3 Purpose and question formulation

The purpose with the thesis is to investigate how requirements are communicated within projects at IKEA IT Delivery. The thesis also analyses what advantages/disadvantages project members experience with the tools used to communicate requirements. The thesis question formulations are:

- How are requirements communicated within projects at IKEA IT Delivery?
- How can a common tool facilitate or aggravate the communication of requirements at IKEA IT Delivery?

2 Project process

The different phases of the project are illustrated in Figure 2. In addition to the different parts described below the author had meetings, with both the mentor from IKEA IT Delivery and LTH Campus Helsingborg, throughout the whole process. In these meetings the mentors were able to follow the projects process and make comment on the thesis. If the student had any questions or problems with the thesis this was discussed in these meetings. The writing of the thesis was a part of all three phases. The phases all depended on each other and the tasks in pre-study enabled the tasks in phase 1 which enabled the tasks in phase 2 and so on.

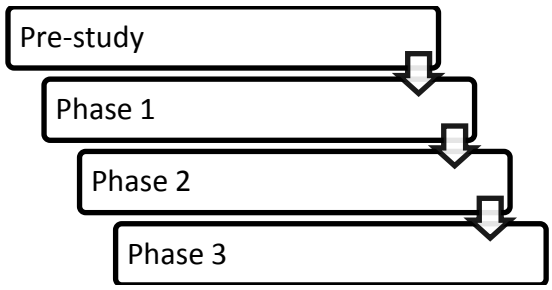

Figure 2: The four different phases in the project

In the pre-study the author identified and limited the question formulation to enable the construction of the interview guide and survey. To construct a suitable interview guide and survey the author studied Quality Center and got an introduction in the tools Quality Center, ClearQuest and ClearCase which are all used at IKEA IT Delivery and explained more in detail in chapter 4.1. In this phase the author also studied literature and reports made on communication of requirements within projects. In phase 1 the author contacted and booked interviews with, for the thesis, suitable project members and searched for e-mail addresses to people who were interesting to the survey.

In phase 2 the author realized the planned interviews and sent out the survey. In this way the author collected accurate data which were processed and analyzed in phase 3.

3 Method

The primary purpose with the thesis was to find patterns in how requirement are communicated and get a deeper understanding in how requirement tools are used at IKEA IT Delivery. To investigate this qualitative method was to prefer (Holme & Solvang, 1997, p.14)(Trost, 2010, p.32). To be able to individualise the questions and ask follow-up questions to project members the author choose to do qualitative interviews (Holme & Solvang, 1997, p.83). The interview guide produced, seen in appendix A, had semi- structured questions and the interviews were more of a discussion than a questioning between the interviewer and the interviewed. To minimise the interviewer impact on the project members being interviewed the interviews were recorded (Trost, 2010, p.74 - 76). The suggested meeting room were chosen because it is a meeting room without much insight and it lies in a calm area at IKEA IT Delivery Helsingborg (Trost, 2010, p. 65). The interview process is described more detailed in chapter 3.1.

The qualitative interviews only describe how the chosen projects work and the author cannot do any kind of generalisation from this data. To enable generalisation and to verify that the tools are used in similar ways at the rest of IKEA IT a quantitative method was complemented the qualitative interviews (Holme & Solvang, 1997, p.86). To simplify the data collecting in this method a survey, seen in appendix B, was produced and sent out to a large number of project members. According to Hultåker (Trost, 2007, p.135) the answering frequency is lower with a web survey than a survey sent out by post. Despite this knowledge the author chose to construct and send out a link to a web survey by mail. The reason for this choice was that it enabled the survey to be sent to a larger number of project members, this is also the recommended way to administrate surveys at IKEA IT. The survey process is described more detailed in chapter 3.2.

With these two methods the author aimed to optimise the thesis potential to do the right conclusions and minimise the both methods disadvantages (Holme & Solvang, 1997, p.85).

3.1 Interview

To describe the interview process it was divided into five parts, see Figure 3. The methods used in the different parts are specified in the chapters below. Each part of the process depends on the prior part, the project selection must be finished before the project member selection can start. Before the author can book an interview with the project member the project member selection

must be finished and the interview must be realized before the data can be processed.

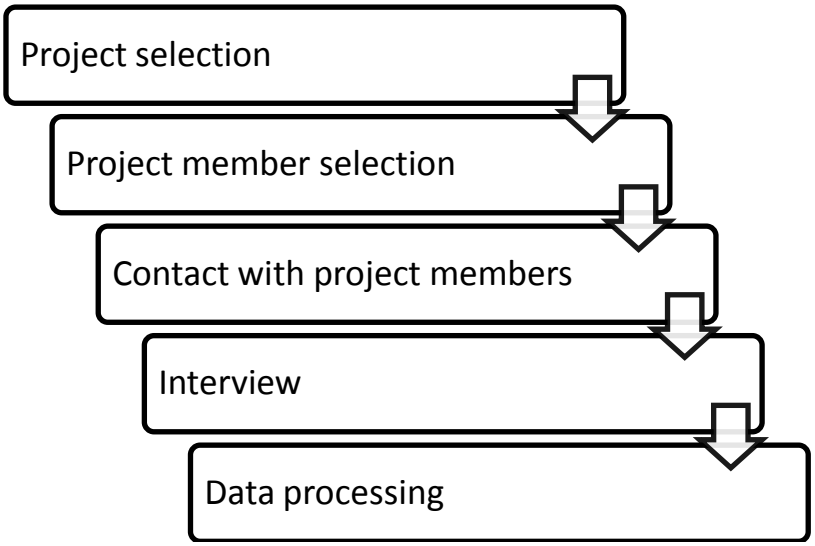

Figure 3: The different parts in the interview process

3.1.1 Project selection

Since the interviews in the thesis are qualitative and therefore do not contribute to any statistical conclusions the project selection was done with strategically convenience selection. In this way Trost (2010, p. 137) means that diversity is assure in the interviews. By strategic selection it was insured that both project members that had used Quality Center and those who had not was interviewed. Furthermore, according to Trost (2010, p. 143), a suitable number of projects were chosen. Fredrik Hjorth, who was my mentor, is product specialist for Quality Center at IKEA IT and works with several Test Managers in different projects. The Test Managers in the six projects chosen have or have had contact with Fredrik Hjorth before.

3.1.2 Project member selection

At IKEA IT it is the Business Analyst and IT Solution Analyst who identifies and manages the requirements. Prior to the reorganization the Business Analyst often worked close with the Test Manager and they often communicated requirements with each other. Now the Business Analyst often hands over the business requirements to the IT Solution Analyst who adds IT requirements and communicates them with the Test Manager. Since the Business Analyst and IT Solution Analyst work directly impacts the Test Managers all three roles were considered interesting for the thesis. In those cases that both Business Analyst/IT Solution Analyst and Test Manager worked at IKEA IT they were both asked to participate in an interview, otherwise the one still working at IKEA IT were interviewed. In some cases

the person being interviewed recommended another person that might be interesting for the thesis, in these cases this person were also contacted and interviewed.

3.1.3 Contact with project members

Since my mentor, Fredrik Hjorth knows the Test Managers and one of the Business Analyst that were chosen for the interviews, the author were introduced to them in person. The thesis was presented and the Test Managers was asked to participate in an interview. At this first meeting it was decided that the interviews should be booked by mail. In the same mail that the time for the interview was decided the Test Managers were asked to leave contact information to their Business Analyst/IT Solution Analyst.

The Business Analysts were all, apart from one described above, contacted by mail. In the mail there was a short description of the thesis and a question if they wanted to participate. The interviews were, them as well booked by mail.

3.1.4 Interview

All seven interviews were calculated to take 45 minutes but 60 minutes were scheduled with the possibility to shorten it. Depending on which role was interviewed the interviews took more or less than 45 minutes, the three interviews with the Business Analysts tended to take longer than the five with the Test Managers. This was due to the fact that some of the questions in the interview guide, e.g. “what kind of requirement type they use the most and how the tool supports this type”, only were asked to the Business Analysts.

Most of the interviews were held in the same meeting room but if the interviewed wanted to be in another room e.g. closer to their workstation this were arranged. Regardless of which room the interview were held in it was a meeting room booked only for the interview and there were no disturbance from other people.

In the beginning of each interview the interviewer presented herself and the thesis and explained what the interview would lead to. The interviewed were asked if the interview could be recorded. This lead to that all interviews except for two, were there were technical difficulties, were recorded. In these two cases the interviewer made notes during the interview, the data was then processed in the same way as the other interviews.

3.1.5 Data processing

After each interview the interviewer did notes about the interview and wrote down the answers to the specific questions. If the interviewed said or indicated anything in particular, e.g. other project members’ thoughts on requirement management tool, this was added to the mind notes.

Later the interviewer listened to the recorded material and added more material to the mind notes. To assure that there were no misunderstandings the interviewer sent the material to the interviewed person for verification. In this way the information from the interviews were reduced without any important information missing (Lantz 1993, p. 79-80).

3.2 Survey

The survey, seen in Appendix B, was a web survey made with a tool provided by IKEA, the link was sent out by mail to fifty IT Solution Analysts, sixty-eight Project Managers and eighty-nine Test Managers who have access to Quality Center. To optimise the question frequency the survey was sent out during a period when there was no other large surveys to answer. The people who the survey was sent to had thirteen days to answer and there was an automatic reminder the day before the last answering day. Out of the two hundred-seven people the survey was sent to twelve answered that they, because of various reasons such as maternity leave or that they no longer were in a project, did not answer the survey. Out of the remaining 195 people forty-nine sent in their answers. Some of the loss can be explained with that the author had the e-mails to all Test Managers which also includes those not in a project. Another reason can be that some of the e-mail addresses may be changed without being updated on the mail list. Due to the recent reorganisation some people may have new e-mail addresses or have a new role but still remain on the e-mail list.

3.2.1 Roles selection

During the interviews it was often insinuated that many of the decisions regarding management tools were done by the Project Manager. Therefore this was one of the roles chosen to participate in the survey. Since the reorganisation at IKEA IT it is mostly IT Solution Analysts responsibility to manage the requirements once the Business Analyst has handed them over to IKEA IT Delivery. How they manage the requirements affects the Test Managers work to a great extent and therefore all of these roles were also chosen to participate in the survey. The survey was sent to persons in these roles not only in Helsingborg but the other IKEA IT offices as well.

3.2.2 Data processing

The tool provided by IKEA processed the answers and facilitated the procedure of composition. Every question was analysed and in the cases where there were answer alternatives the author got a graph representing how many answers each answer alternative got, both in percent and number. In the cases where there were no answer alternatives the author got a list with all the answers. The tool also enabled filtering, e.g. if the author only wanted to see the surveys where the one that had answered was e.g. Business Analyst.

To analyse combined questions and see patterns the author made an answering matrix where all surveys was a rows and the answer alternatives columns, in this way all surveys were compiled in a perspicuous way. If there was a person who had answered a question with "other" and then specified their answer this was shown in the matrix. This matrix facilitated when the author wanted to analyse e.g. if the persons that answered that they were satisfied with the requirements tool were one of those who decided what tool the project should use.

3.3 Validation

According to Runeson and Höst paper "Guidelines for conducting and reporting case study research in software engineering" this thesis with its question formulations and methods of research is a case study. Runeson and Höst means that "A case study will never provide conclusions with statistical significance. On the contrary, many different kinds of evidence, figures, statements, documents, are linked together to support a strong and relevant conclusion" (Runeson & Höst, 2008, p.137). To reduce bias by individual researchers and assure a strong conclusion Runeson and Höst find that the results benefits from being analysed by multiple researchers. As the only author for the thesis this was not possible but a comparable, although smaller, study with similar results was made by IKEA IT in 2011. The author's conclusions are also verified in discussions with personnel and consultants at IKEA IT. This shows that it is not only the author's point of view which is presented but the personnel and consultants at IKEA IT.

Runeson and Höst (2008, p. 136) find that Seaman "Qualitative methods in empirical studies of software engineering" (1999) means that a combination of qualitative and quantitative research methods often provides the author with a better understanding of the studied phenomena. The fact that the thesis used both qualitative interviews and a quantitative survey as research methods therefore strengthens the thesis validity and achieves Stake's methodological triangulation (1995, p. 112-114).

Two out of Stake's three other triangulations, data, observer and theory, were achieved by:

- Multiple interviews with different project members
- A survey sent to two hundred-seven project members active in different projects and countries
- Comparative study made by IKEA IT

Runeson and Höst (2008, p.154) have summarised validation threats and classification of validation from Yin (2003) and Wohlin (2000) into four different validation groups, construct validity, internal validity, external validity and reliability.

The construct validity the author assured by using IKEA IT terminology both in the survey and during the interviews. Both the survey and the interview guide were reviewed by the mentor at IKEA IT and LTH. If there were any ambiguity with the survey the participants were asked to contact the author, whose e-mail and mobile phone number were attached both in the e-mail that encouraged the project members to participate in the survey and in the information sheet for the survey. During the interviews the author asked similar questions to understand what experiences the project member had and why a phenomenon was experienced in this way. If there were any ambiguity during the interviews the author asked the interviewed to explain their experiences. After the interview the interviewed was sent a summary on the interview and asked to confirm that the author had understood the answers correctly.

The internal validity the author minimised by having an open mind on what parameters affected the project members work and experiences. The interview questions, seen in Appendix A, were all open questions without answering alternatives. In the survey, seen in Appendix B, there was always the possibility to answer "other" and then manually specifying the answer.

Since the project members had different roles and were in different projects the research material were relative large which provided the thesis with a variety of different opinions and experiences. This also assured that the thesis conclusions were interesting and relevant to other projects which results in external validation.

To maintain reliability both a clear interview guide and survey was constructed. In addition to this it is difficult to assure high reliability when studying an unstable environment. As mentioned in the introduction chapters IKEA has and probably will experience changes which will affect project members' opinions and experiences. According to Trost (2010, p.133) qualitative methods purpose is to investigate how phenomena changes over time and reliability is therefore impossible to accomplish.

4 Result

In the following chapters results from phases 1, 2 and 3 are presented and discussed. When reading diagrams the y-axel represents number of project members.

4.1 Tools used at IKEA IT Delivery

This part of the thesis is a result from the pre-study phase and describes different tools, sometimes used as requirement management tools, and how they are used at IKEA IT Delivery.

4.1.1 ClearCase

ClearCase is a software configuration management tool from IBM which offers project members access to the same files and the possibility to work parallel. At IKEA IT Delivery ClearCase is used mainly by developers to facilitate the development. When a work order is made in ClearQuest developers use ClearCase to manage and version control files related to the new implementation (Axstrand, 2012-03-23). When ClearCase is used as a requirements tool the requirement documents are managed as files in ClearCase so that everyone that has access to the files has the latest version. According to IBM ClearCase is "an industry-leading solution that provides sophisticated version control, workspace management, parallel development supporting and auditing to improve productivity" (www.ibm.com, 2012-04-03).

4.1.2 ClearQuest

IBM means that ClearQuest "provides change tracking, process automation, report and lifecycle traceability for better visibility and control of the software development lifecycle" (www.ibm.com, 2012-04-03). IKEA uses ClearQuest as a software change management tool in which IKEA's employees can submit issues of different types such as change requests, enhancement requests, problem reports and defect reports. When the process for issues is finished the solution proposed, by the responsible for the request or report, is denied or approved. If the issue is approved on a Change Control Board meeting the issue is planned with work order in ClearQuest and sent to a developer in ClearCase as an activity (Axstrand, 2012-03-23). When IKEA IT Delivery uses ClearQuest as a requirements tool all requirements are entered into ClearQuest as issues and then managed as described above.

4.1.3 Projectplace

Projectplace is a web-based tool were project management, with functions like project planning, online meeting, version control and resource management, handle projects. In Projectplace all project members with the same status have access to the same information. If wanted, different users can have different access to documents. Another feature is that the project can invite stakeholders

to follow the projects process via an external project webpage (www.projectplace.se, 2012-04-03).

4.1.4 ReqPro

According to IBM ReqPro "helps project teams to manage their requirements, to write good use cases, to improve traceability, to strengthen collaboration, to reduce project rework and to increase quality" (www.ibm.com, 2012-04-04). Since IBM no longer provides support on ReqPro IKEA IT Delivery have chosen to close their internal support on ReqPro and not use this tool any more.

4.1.5 Quality Center

Since Quality Center is the recommended and only supported test management tool at IKEA IT it is used by most Test Managers at IKEA IT (Hjorth, 2012). In addition to the test modules in Quality Center there is a management module, which enables the user to organise and track application releases, a dashboard module, in which the user can create graphs and reports, a requirements module and a defect module. In the requirements module the user can create, organise and link the requirements to test cases, defects or other requirements. The defect module enables the user to add a defect and prioritise repairs (Hjorth, 2010). According to Hewlett Packard's web page Quality Center's key benefits are:

- Prioritize testing based on business risk
- Access testing assets anytime, anywhere
- Schedule and execute tests automatically, 24x7
- Analyze readiness with integrated graphs and reports
- Manage defects and trace them to tests and requirements (www.hp.com, 2012-04-04)

At the moment IKEA IT Delivery do not use all of the above features and therefore misses some of the listed benefits. Since the decision in making Quality Center the recommended tool also for requirement management at IKEA IT Delivery this may change in the future.

4.2 Interviews and survey

In this chapter results from the seven interviews are presented and discussed together with the forty-nine answers from the survey.

The seven interviews were held with three Business Analysts and five Test Managers from six different projects.

The survey was sent to 207 people in roles as IT Solution Analyst/Business Analyst, Project Manager and Test Manager. Because of various reasons, such as maternity leave or that the person no longer was in a project, twelve people

notified that they would not answer the survey. Out of the remaining 195 people there were forty-nine who answered the survey. The forty-nine people were members of thirty-two different projects and two “in line”- productions.

4.2.1 Roles and experience

As seen in Figure 4 five of the forty-nine project members that answered the survey were Business Analysts. Nine were IT Solution Analysts, sixteen Project Managers, eleven Test Managers and seven had other roles such as Business Developer, Test Specialist and Solution Area Manager. One project member did not specify their role.

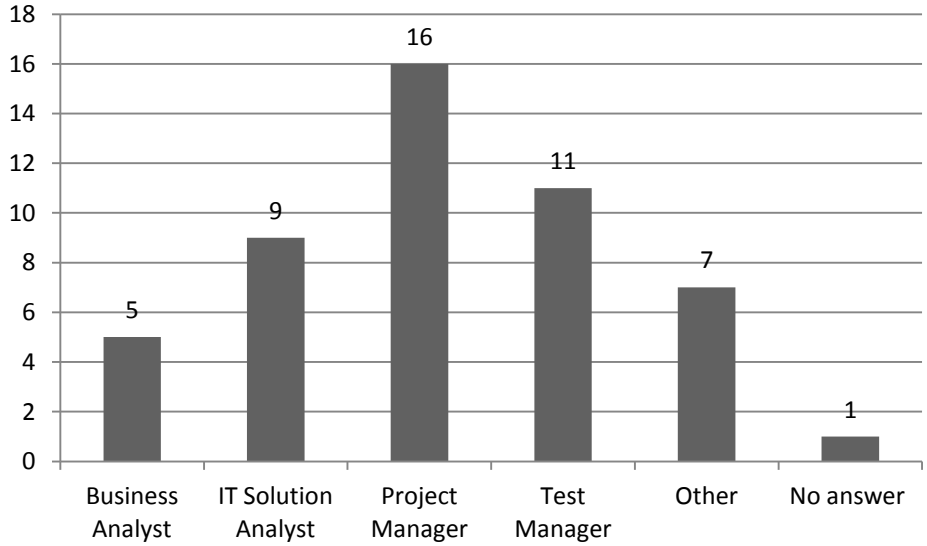

Figure 4: The role distribution of the forty-nine that answered the survey

Since both the Business Analysts and IT Solution Analysts has responsibility for requirement management the distribution between the different responsibility areas are relatively even which provides the thesis with various input from all involved areas. As shown in the discussion below and in Figure 5 most of the project members that answered the survey had long experience from their roles in the current projects and requirement management. This suggests that the project members’ answers give a fair indication of how projects work and manage requirements at IKEA IT.

Out of the forty-nine project members twenty had over 12 months experience from their role in the current project, thirteen had 9-12 months experience, nine had 3-6 months and three had 0-3 months experience.

When they were asked how long experience they had from requirements management almost half of them, as seen in Figure 5, answered over five years.

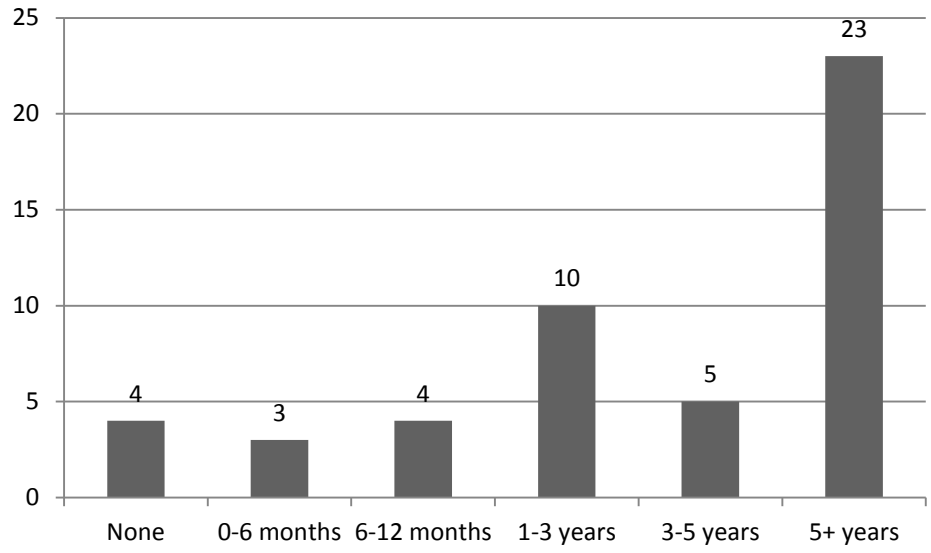

Figure 5: How long requirements management experience the forty-nine project members that answered the survey had

In Figure 6 it is presented that only one out of the five Business Analysts who answered the survey had between six and twelve months experience, the remaining four had more than five years experience. Most of the nine IT Solution Analysts also had, as seen in Figure 6, more than five years experience from requirement management. Three had 1-3 years experience and one had 0-6 months of experience.

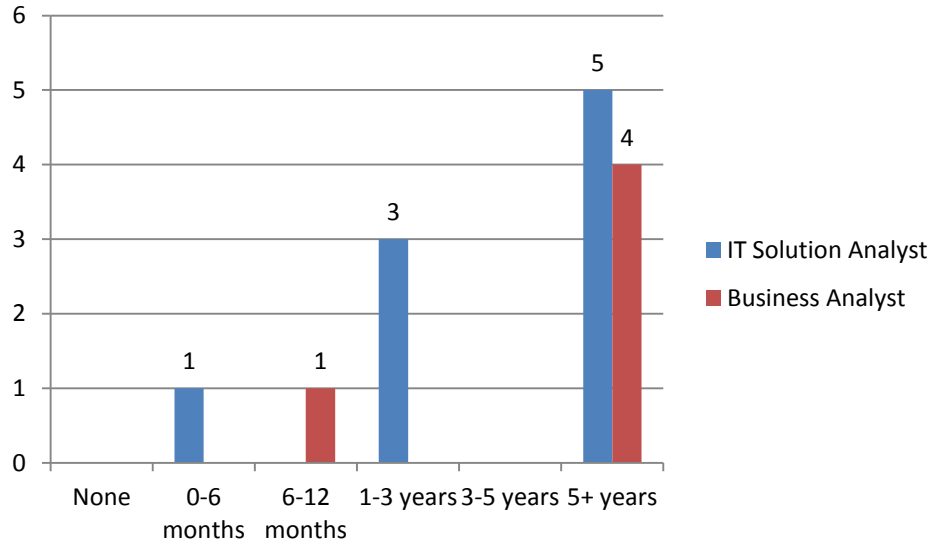

Figure 6: How long experience the five Business Analysts and nine IT Solution Analysts that answered the survey had from requirement management

4.2.2 Requirement tools

As seen in Figure 7 Word was a slightly more used tool than ClearQuest with twenty-two users against twenty-one. Out of the forty-nine answers nineteen stated that they used Projectplace and eighteen that they used Quality Center. Excel was used by fifteen projects and ClearCase by twelve. ReqPro was used by one project and four projects used other tools such as flow charts, mails, design documents and interface specification documents to manage their IT requirements.

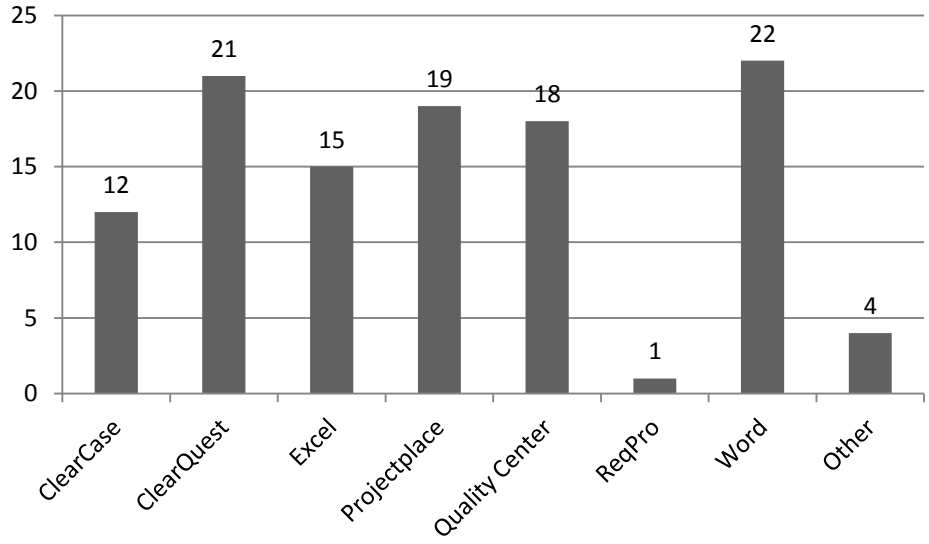

Figure 7: Results from question 5A; How does the project manage IT requirements?

One of the reasons to why Word was the most used tool can be that it is a well-known tool with almost no learning period and that it is easy to access. As seen in Table 1 Word was almost always used with other tools such as Excel, ClearCase and Projectplace, in those cases the requirements may be written in Word and then managed in another tool. This was the case in the project where interviewed Person 5 was Test Manager. The project used Word and ClearCase, Word to specify the requirements and ClearCase to manage and version control the Word documents.

In unofficial discussions with personnel and consultants at IKEA IT the author has understood that some projects use Word to specify the requirements and Excel to get an overview of the links between different requirements and traceability between requirement and test. Why this is a common way of working can be verified by Table 1 which shows that Excel always was used in combination with at least one other tool when managing IT requirements.

One of the reasons to why Excel was used may be that it, as Word, is a well-known tool with a very short learning period. Excel is also one of the tools that the personnel at IKEA IT has access to.

The reason to why ClearQuest were used by so many projects may be that it can be used both alone and in combination with other tools. As seen in Table 1 five projects only used ClearQuest as their requirement tool to manage IT requirements and sixteen used it in combination with other tools. In the interview with Person 3 it was specified that the project where Person 3 is Business Analyst used Quality Center to manage their requirements but they combined this tool with ClearQuest. In ClearQuest they managed change requests, enhancement requests, problem reports and defect reports, thus the developers could get a work-order and start the development.

When using ClearQuest as the only requirement management tool projects could use it the same way as the project where Person 1 was Test Manager. They entered all their requirements into ClearQuest as change requests and managed them as an ordinary change request, described in chapter 4.1.2 .

The result that stood out the most in Figure 7 was how many users Projectplace had. Projectplace is not a recommended tool at IKEA IT although nineteen project members stated that they use it. This may indicate that project members would like to have all information regarding the project in one place and one place only. Since Projectplace is not developed especially for software development it does not provides e.g. test environment or change management which can be a disadvantage. This may be one of the reasons to why all, except for one, of the projects that used Projectplace also used other tools to manage their IT requirements.

The fact that ReqPro is not used in more than one project is not strange concerning that IKEA IT has chosen not to use the tool anymore and does not provide any support on it. The project that used ReqPro, as seen in Table 1, also used ClearQuest, Excel, Projectplace and Quality Center to manage their IT requirements. This indicates that the requirements in ReqPro may be “old” requirements that were specified when ReqPro still was in use and that they could be moved to one of the other tools.

Table 1: What tools the projects used to manage IT requirements. Each row represents one project.

ClearCase	ClearQuest	Excel	Projectplace	Quality Center	ReqPro	Word	Other
x							
	x						
	x						
	x						
	x						
	x						
			x				
				x			
				x			
				x			
				x			
				x			
				x			
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x						x	
	x		x				
	x		x				
	x			x			
	x					x	
	x					x	
		x		x			
		x				x	
		x				x	
			x	x			
			x			x	
x	x	x					
x	x		x				
x	x					x	
x		x	x				
x		x				x	
x						x	x
	x		x			x	
	x		x	x			
		x	x			x	
		x	x			x	
		x		x		x	
			x	x		x	
			x	x		x	
x	x	x				x	
x	x	x				x	
x	x		x	x			
		x	x			x	x
x	x		x	x		x	
	x	x	x	x	x		
	x	x	x	x		x	
		x	x	x		x	x

As seen in Table 1 and as discussed above many projects used more than one tool to manage their IT requirements, how many tools the different projects members stated that they used are specified in Figure 8. Most project members used only one tool but eleven project members used two tools and fourteen members used three different requirement management tools. There were three project members that used four tools and four project members used five different requirements tools to manage their IT requirements.

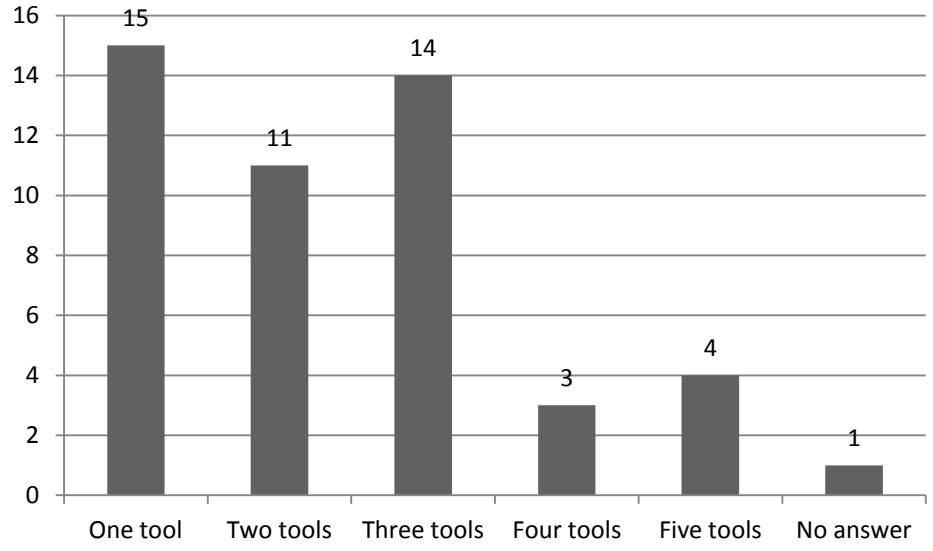

Figure 8: How many requirements tools the projects use to manage IT requirements

The results regarding how project members managed Business requirements, presented in Figure 9, are similar to how they managed IT requirements. Twenty-five project members used Word, twenty Projectplace, eighteen used Excel, sixteen Quality Center, fifteen ClearQuest, six ClearCase and five project members used other tools such as pdf, global and local blueprints, flowcharts and mail.

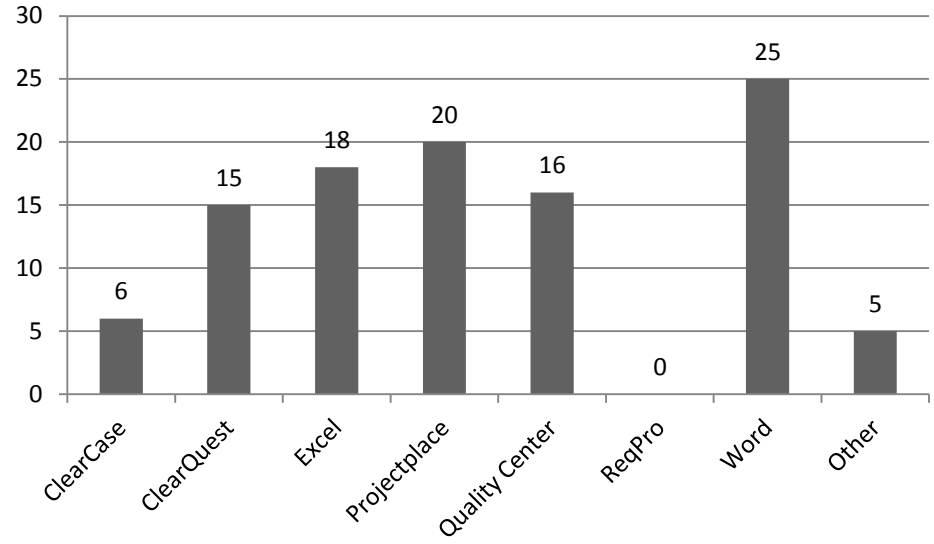

Figure 9: Results from question 5B; How does the project manage Business requirements?

The reasons to why these tools are used the author presumes to be the same reasons to why they were used to manage IT requirements.

Word and Excel are easy to access and have a short learning period while Quality Center is a more complex tool but also offers more features e.g. traceability between requirements and test. Projectplace are still used by fourteen different project members which can verify the authors presumption regarding that the project members aims to gather all information concerning the project in one place. The two tools that have lost most users are ClearCase and ClearQuest which both have lost six users each. This could be explained with that the business requirements are not specified to the same extent as the IT requirements and therefore cannot be entered directly into ClearQuest. Since the business requirements often are goal requirements the developers cannot use them directly and the Project Manager maybe chooses not to share them in ClearCase to the same extent as with IT requirements.

Even though the average of used tools were slightly lower in this category, as seen in Figure 10, it was still very common that project members used more than one tool to manage their business requirements.

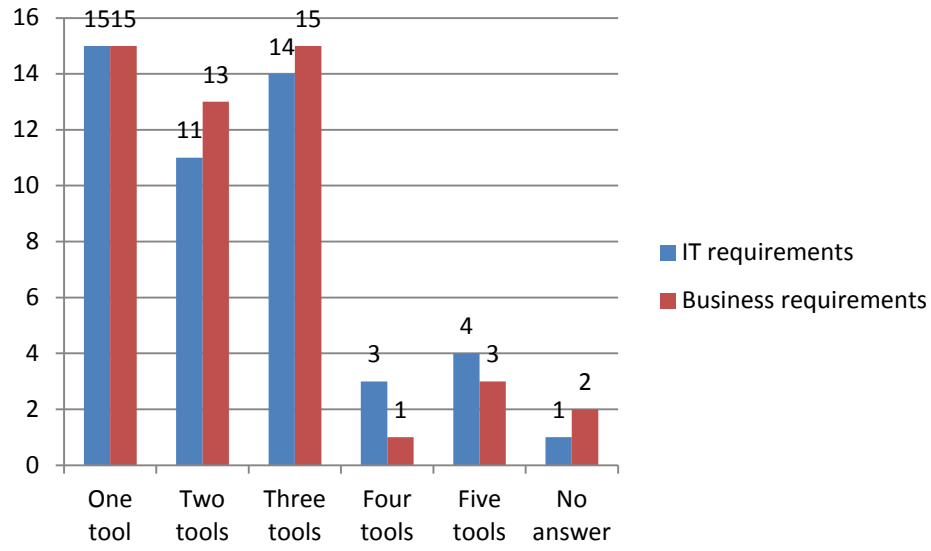

Figure 10: How many different tools the project members used to manage IT and business requirements

One of the differences between the tools that were used was, as seen in Table 2, that there were five project members that only used Word or Excel to manage their requirements compared to only one project member that used Word to manage IT requirements. When comparing Table 1 with Table 2 it becomes clear that ClearQuest is the tool that have lost most of its users in the category with project members that only used one (1) requirement management tool.

Table 2: What tools the projects used to manage business requirements. Each row represents one project.

ClearCase	ClearQuest	Excel	Projectplace	Quality Center	ReqPro	Word	Other
	x						
	x						
		x					
		x					
			x				
			x				
				x			
				x			
				x			
				x			
				x			
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		x				x	
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		x				x	
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		x	x			x	
		x	x			x	
		x				x	x
			x			x	x
			x	x		x	
			x	x		x	
x	x					x	
x						x	x
		x	x	x		x	
x	x	x	x			x	
	x	x	x	x		x	
		x	x	x		x	x

In Table 1 and even more in Table 2 it is clear that Quality Center is the most common tool to use if the project member only uses one requirement management tool. An interesting aspect is that Quality Center is used to such a great extent when managing business requirements although that the Business Analysts, according to Björk (2012-03-08), are investigating the possibility to use another requirements management tool. In the new organisation the

Business Analysts wishes to find a more intuitive tool where the stakeholders can follow their requirements throughout the whole project. Björk (2012-03-08) means that Quality Center is a good tool that provides features for managing requirements but for personnel that does not work with requirement management on a daily basis Quality Center can be complex. If the Business Analysts find another tool IKEA have to find a solution on how to transfer the business requirements from business and the Business Analysts to IKEA IT and Quality Center.

From the authors point of view it seems almost impossible to keep all used tools updated with the latest version of the requirements with links to the right requirements and tests. The author believes that it must be difficult to get an overview of the project and that there has to be more time-saving ways of managing requirements.

One explanation to why projects used so many different tools can be that different project members prefer different tools. The Test Managers maybe prefers Quality Center to secure the traceability between tests and requirements and the developers prefer ClearQuest to get a work-order which facilitates management of change requests. The Business Analysts on the contrary wants to use an intuitive tool where the stakeholders or future users can follow their requirements throughout the whole project.

Maybe Augustsson highlights a common problem in the article “time to place new demands on the requirement management tools” which states that requirement management tools need new features such as support for chat, discussion, mind maps, video and flowcharts (www.testzonen.se, 2012-05-02). A frequent opinion in IT forums is that there is no good enough tool to manage requirements on the market. Either the authors in the forums have right when they state that there is no tool that facilitates the requirements management from elicitation and validation of requirement through development, test, defect reports and finally validation and verification of the product. Or they do not know all the features of the requirement management tools on the market.

In the survey for the thesis five project members out of the twenty-seven that did not use Quality Center did not know that Quality Center had a requirements module. Out of the twenty-two who did not use Quality Center but knew that it had a requirements module ten had used it. The remaining twelve project members specified the lack of possibility to connect to other tools e.g. ClearQuest or that the decision was already made when the joined the project as reasons to why they did not use Quality Center. Fredrik Hjorth, responsible for Quality Center at IKEA IT, is well aware of these wishes and

has requested a pre-study which would investigate the possibilities to automate this link.

Person 5 means that “if we were able to link Quality Center to ClearQuest in a reliable way so that work orders could be done from Quality Center maybe the other project members would change their mind regarding using Quality Center.” Person 7 and Person 8 miss “the ability to connect Quality Center with other tools. Now if you want to do a change request you have to use three different tools. Therefore we choose not to use that feature in Quality Center.”

One project that had chosen to work with almost all features in Quality Center and therefore had to find a solution to this problem was the projects where both Person 3 and Person 2 were project members. Their solution was to have all releases, tests and requirements in Quality Center and then link change requests in Quality Center to change requests in ClearQuest as seen in Figure 11. The change request in Quality Center had no other information than an id, the same id was used in ClearQuest were the description for the change request was entered and managed. This gave the project members traceability throughout the whole project.

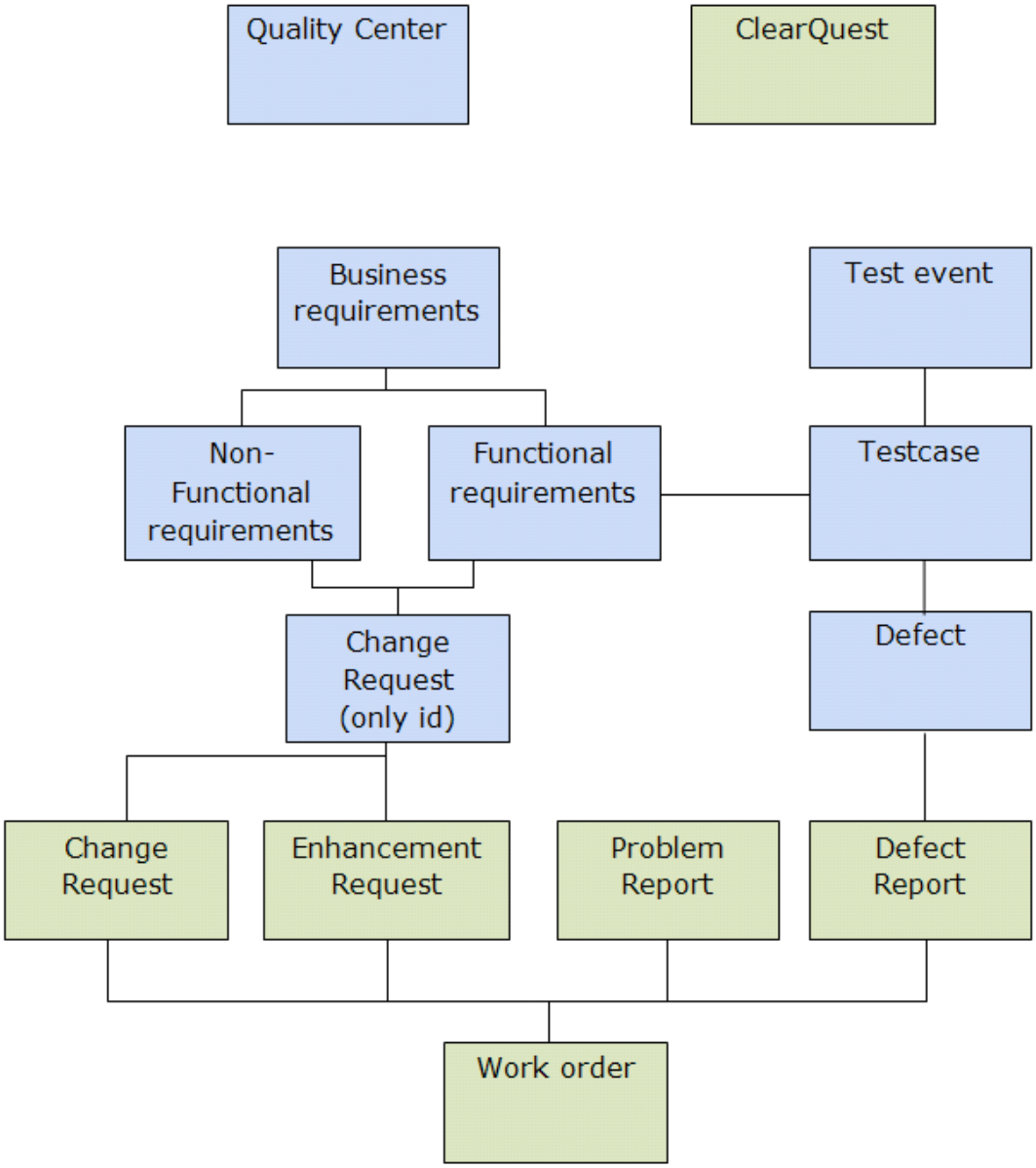

Figure 11: Person 3 projects solution in how to link Quality Center to ClearQuest

If there was a feature in Quality Center that did this link automatically it would as Person 2 mentions in the interview certainly facilitate the project members work.

Two other reasons, besides the possibility to link Quality Center to e.g. ClearQuest, to why projects did not use Quality Center were that the project member thought that Quality Center was a complex tool. The project members did not know all features in Quality Center and thought that it had a long learning period. One project member stated that Quality Center had not been promoted and that the project members did not know how to use is as a reason to why they did not use Quality Center. Furthermore the project member

requested information on what experiences other projects, which have used Quality Center, has from using it.

That some kind of forum where projects could share experiences is requested was also indicated in the interviews. Person 6 stated that “it would be great to have a knowledge centre with other projects that have used Quality Center to learn how they manage the requirements. Then other projects do not have to make the same mistakes.”

Maybe a knowledge centre would facilitate for employees with little experience from requirements management or when projects are to make the decision what requirements management tool to use. Person 4 mentioned in the interview that he did not have enough experience from requirements tools to compare the way the project had worked with requirements to anything else. Further Person 4 stated that “to use the requirement module I, and maybe the rest of the project members, needs education in Quality Center. Now I only know how to use Quality Center in my work as a Test Manager.” With a knowledge centre Person 4 would be able to see advantages with Quality Center and maybe learn from other projects without using it. Person 4 would consequently get a deeper understanding and contribute more to make a conscious choice in the future. A knowledge centre where projects could share how they have solved eventual problems could also help Person 5 promoting Quality Center to the other project members. In the knowledge centre the project members would see how Person 3 and Person 2 team have solved the problem with connections between Quality Center and ClearQuest and maybe this solution could work for Person 5´s project as well. This could also be a forum where Hjorth could inform about planed updates and new features in Quality Center. Maybe some educational questions could be solved here as well.

4.2.3 Satisfaction

Although that the project members often used many and different tools most projects members were, as seen in Figure 12, satisfied with their requirements management tool.

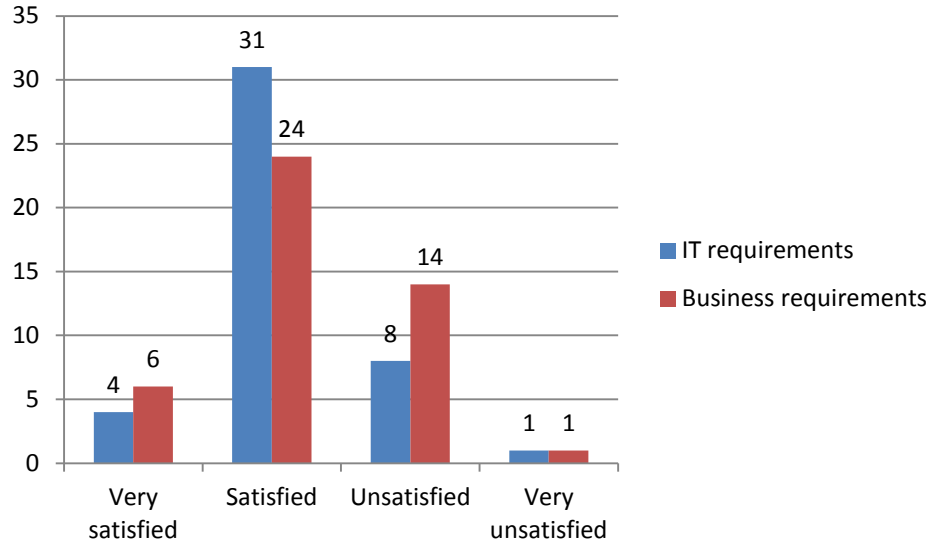

Figure 12: How satisfied the project members were with their requirement management tool

That the number of tools impacted the project members' satisfaction, foremost regarding managing IT requirements, are shown in Figure13. Since, as seen in Figure 14, the numbers of very satisfied and satisfied project members were about the same when the project members used one and two tools for managing business requirements Björk's (2012-03-08) statement that the Business Analysts have not found a tool that provides all features for the requirement process, may be verified.

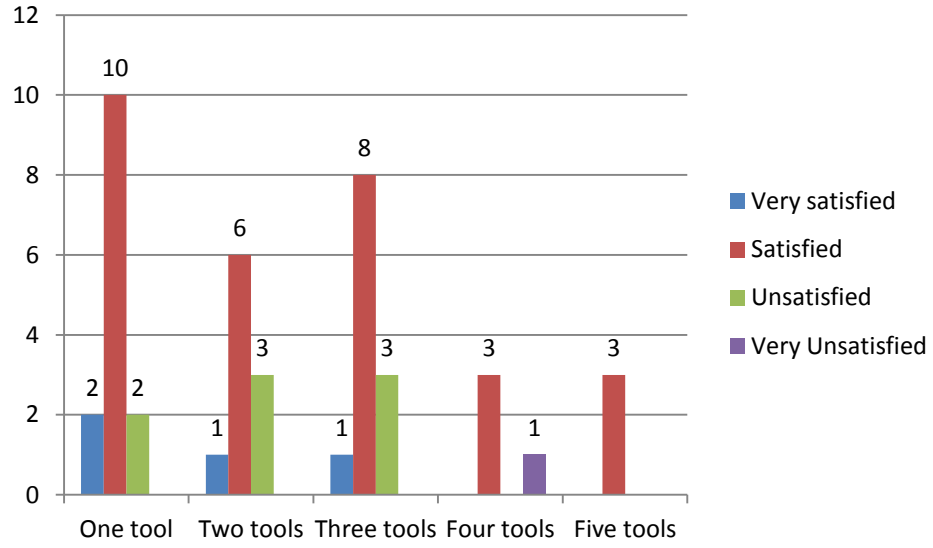

Figure 13: The number of tools the project members that were very satisfied, satisfied, unsatisfied and very unsatisfied used to manage IT requirements

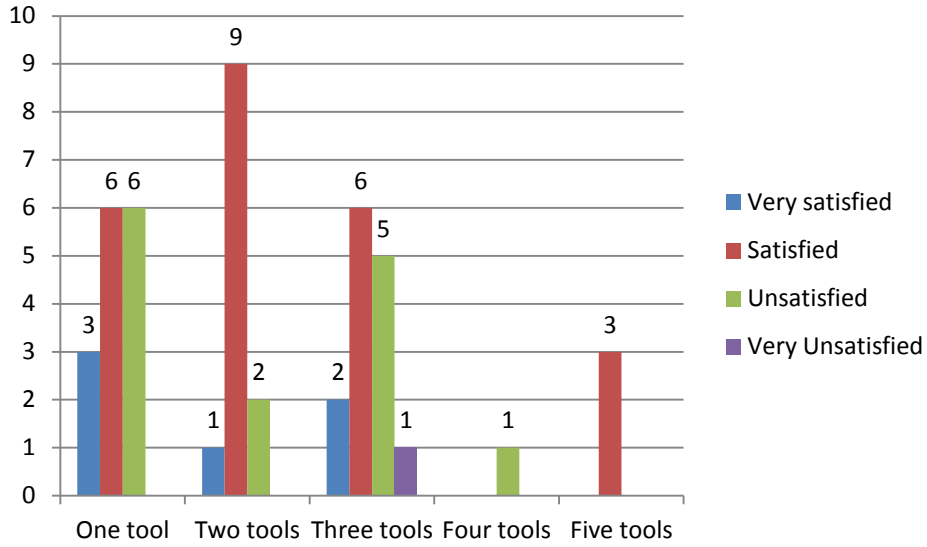

Figure 14: The number of tools the project members that were very satisfied, satisfied, unsatisfied and very unsatisfied used to manage business requirements

The four project members who were very satisfied with their tool to manage IT requirements all specified “traceability between requirement and test” as the largest advantage with the tool. The project members were all members of different projects and two of them only used Quality Center to manage IT requirements. One project used Projectplace and Quality Center and another project used ClearCase, ClearQuest and Projectplace to manage their IT requirements.

In the six projects where the project members were very satisfied with their business requirement tool two out of the three project members that only used one tool used Quality Center, the third project member used global and local blueprints. The remaining three project members used Projectplace and Quality Center; ClearCase, ClearQuest and Projectplace and ClearQuest, Projectplace and Quality Center. Three of the project members stated that traceability between the requirements and tests were the largest advantage with the tool, one of the project members that only used Quality Center stated that ease of communication of requirements were the largest advantage. Another project member stated that “one and only one place for "the truth"-requirements, test, and implementation” was the largest advantage while one project member stated that all the specified advantages, timesaving, traceability between requirement and test and ease of communication of requirements, were the largest advantages.

That traceability between the requirements and test is an important feature in requirements management tools when managing IT requirements are not only shown in the discussion above but also in Figure 15.

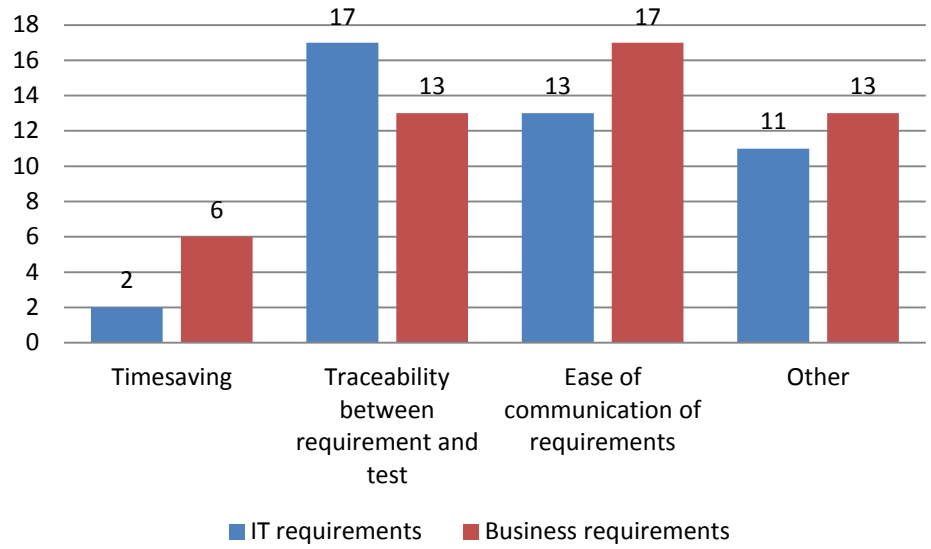

Figure 15: The largest advantages with the requirement management tools

Out of the eleven project members that answered "other" on what the largest advantage was with their tool to manage IT requirements only four specified their answers with advantages. Two of the project members stated that there were no advantages, one with the comment that "Excel is not a satisfying requirement tool." The both project members used Word and Excel along with Projectplace or ClearCase as requirement tools to manage IT requirements. Another project member who used ClearQuest specified traceability to development as the largest advantage of the requirement tool to manage IT requirements. One project stated that traceability for each release was the largest advantage.

Seventeen project members stated that the largest advantage with their Business requirement tool was to ease communication of requirements. The project members that answered "other" motivated their answers in almost the same way as they did when motivating the IT requirement tools largest advantage. The project member who did not think that Excel had any advantages when managing IT requirements did not think it had any advantages managing business requirements either.

Traceability between requirements, tests and defects is according to the author one of Quality Center's largest advantage as a management tool in software development. Quality Center provides the possibility to link requirements to both each other and tests. If a requirement is changed it is easy to see which tests and other requirements that are affected by the change and if they should be changed as well. Quality Center also enables the project members to see if, and to which extent, the requirements are tested and if the test was passed or failed which facilitates the project member to see if a requirement is fulfilled

or not. When a defect is made this also shows in both the test linked to the defect and the requirement linked to the test. With this feature project members can identify if there is one requirement that is difficult to fulfil and then have a discussion if the requirement maybe is a contradictory requirement and should be changed or if it is an important requirement for the product.

The fact that all this information is gathered in one tool which every project member can have access to the author also believes must ease the communication of requirements, test results, number of defects and the progress of the project. One of the features in Quality Center is that project members can have different roles and therefore the permission to change different things. A Test Manager can e.g. have permission to write and change test cases but only read the requirements. This enables the project to share all information with each other without the risk of anything being changed by an unauthorised project member.

Quality Center also provides some of the features that Augustsson requested in the article "time to place new demands on the requirement management tools" (www.testzonen.se, 2012-05-02). In Quality Center the project member can attach files and pictures to both requirements and tests. When a defect is made files, pictures, info about the computer and its components are easily attached to facilitate the error diagnosis.

These features were also mentioned in the interviews as some of the most important features in Quality Center.

Person 3 stated that:

- "the project can decide about the structure, how to organize and group requirements on different levels. E.g. group business requirements in releases or functions and IT requirements per IT-system and then create traceability between requirements in IT-system to releases or functions via business requirements
- traceability between test and requirement
- traceability between different levels of requirements, e.g. business requirements and IT requirements, and between requirements and releases
- get a good overview over all the requirements, business requirements traced to IT requirements traced to test are
- all requirements at one place"

were some of the advantages with Quality Center. This was also mention by Person 6 who stated that

- "link - You can link requirements to each other, to defects and attach documents, e-mails etc.
- process - It gives you an overview over the process and where you are in it
- history - You can see who has changed things and when"

were some of the largest advantages with Quality Center.

In both the project where Person 3 and Person 6 was interviewed they had a different way of identifying requirements. Person 3 only described the gap between two products in the requirements and Person 6 presupposed from the existing functions in the suppliers user guide to identify the projects requirements. If a project were to start from scratch with identifying the stakeholders and elicitation of the requirements before identifying and specifying them a tool for this purpose would probably help. As Person 1 mentioned in the interview "there is no requirement process in Quality Center, only a module for organising the existing requirements so it does not help with creating requirements."

The common view of those who answered the survey or was interviewed for this theses seems to be that Quality Center is, as seen in Figure16, a good, or very good, tool to manage requirements once the requirements are identified and specified. To produce the requirements and help the Business Analysts through the requirement processes with elicitation and verifying of the requirements another technique or tool is to prefer.

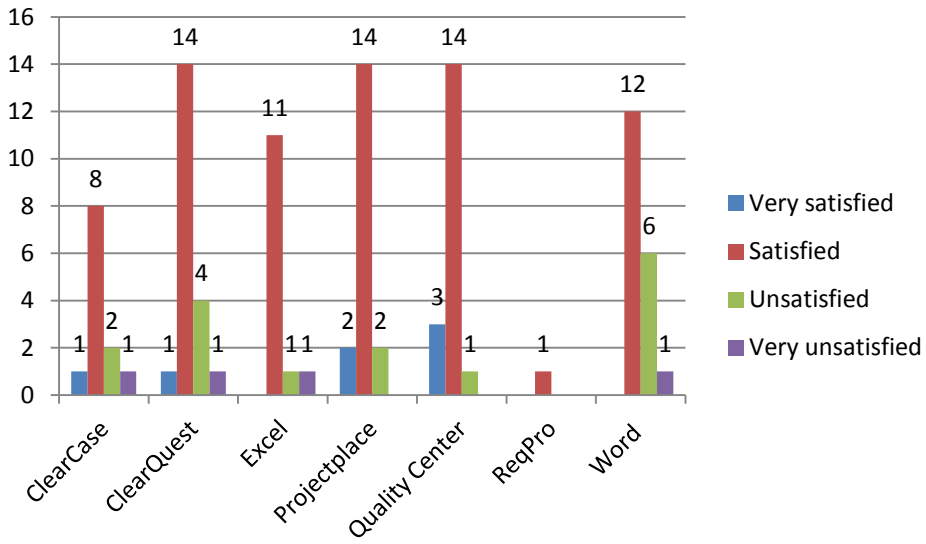

Figure 16: How satisfied the project members were with the different tools to manage IT requirements

This conclusion becomes clearer if the project only using one tool to manage their IT requirements is viewed. In the fifteen projects where only one tool were used to manage IT requirements one used ClearCase, five ClearQuest, one Projectplace and six Quality Center. One project only used Word and one project used Interface specification documents to manage their IT requirements. How satisfied the project members were with their requirement tool is shown in Figure 17.

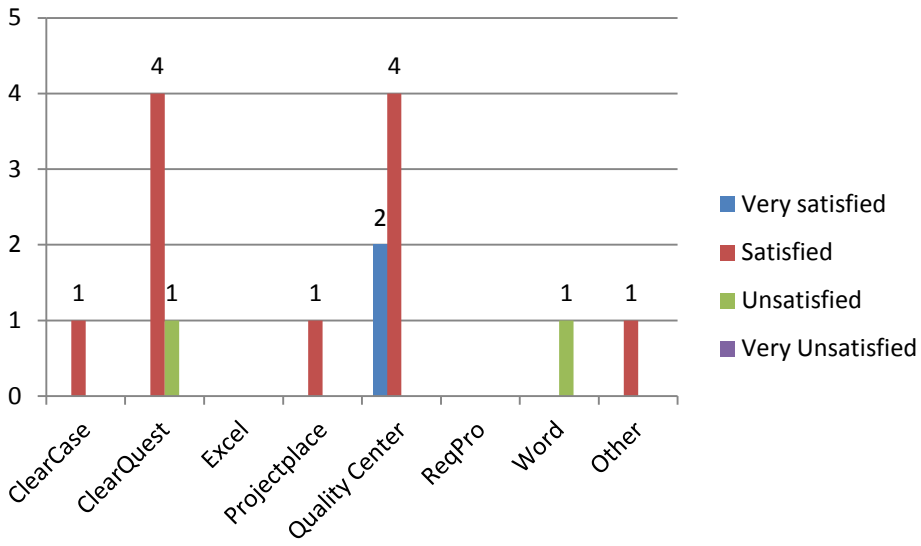

Figure 17: How satisfied the project members, only using one tool, is with their requirement tool to manage IT requirements

That project members thought that Quality Center also provides all necessary features for managing business requirements shows in Figure 18.

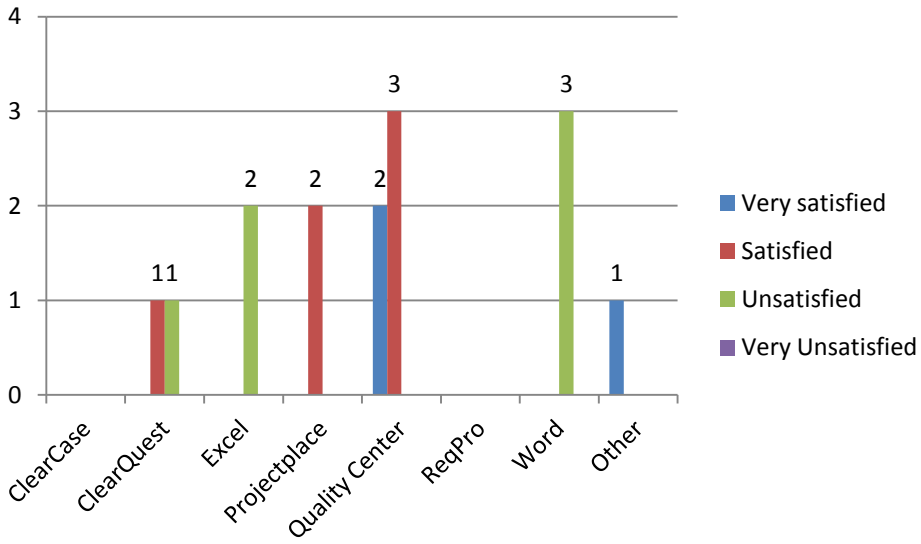

Figure 18: How satisfied the project members, only using one tool, is with their requirement tool to manage Business requirements

These two figures verify the author's discussion regarding that Quality Center is a good enough tool to use by itself. It also supports IKEA's decision in making Quality Center the recommended tool for requirement, test and defect management.

5 Conclusion

The fact that IKEA IT has not had a recommended or common way to manage requirements was clear in this thesis. In the seven interviews and forty-nine answers from the survey only a few project members managed their requirements in with the same tools. Thirty- three out of the forty-eight project members which answered the question on which tools they used to manage IT requirements used more than one tool. Out of those thirty-three project members four used five different requirement tools to manage IT requirements. The result regarding business requirements resemble the ones for IT requirements. Thirty-four project members out of the forty-nine who answered the question used more than one tool to manage business requirements and three of those project members used five different requirement tools.

Although that it, according to the author, must be difficult to keep all information up to date when using many tools most of the project members were satisfied with their requirement tools. In the projects that only used one (1) tool to manage their requirements Quality Center was the most common, both when managing IT requirements and business requirements. Most of the project members specified "traceability between requirement and test" as the largest advantage with the tool when managing IT requirements and "ease of communication of requirements" as the largest advantage for managing business requirements.

Both this features are according to Fredrik Hjorth, the author, Person 3, Person 6 and Person 5 well developed in Quality Center. The tool facilitates traceability between different requirements, between requirements and tests and between tests and defects. This provides the project members with the possibility to e.g. see which requirements are affected by a defect.

To facilitate the work in Quality Center Person 6 and some of the project members who answered the survey suggested a forum where project members could share their experiences from using Quality Center. The forum could help projects solving problems that may have been solved by other projects before and it would prevent projects from making the same mistakes.

One of the features that the interviewed lacked in Quality Center was the possibility to link the tool to ClearQuest in which work orders for the developers are constructed. One of the projects interviewed for the thesis had solved this problem with "parent-child" relationship between the change requests in Quality Center and change requests in ClearQuest. This solution may work for other projects as well and if the information was spread to other

projects, e.g. via a forum, it would facilitate the work for other project members.

The wish to automate this link between Quality Center and ClearQuest in the feature exists and Fredrik Hjorth has requested a pre-study to investigate the possibilities.

With the surveys result regarding how projects manage requirements and how satisfied the project members are with the different tools the author conclusions is that there was no common way of managing requirements at IKEA IT when the survey was made. IKEA IT has during the thesis work taken a decision which results in that Quality Center now is the recommended tool for managing requirements, tests and defects.

This decision is also supported by the thesis which shows that the project members only using one tool to manage requirements tended to be more satisfied with the management of requirements. Both in the answers of the survey and in interviews project members stated that to use only one requirement tool facilitated the project members' work. The project members who only used Quality Center was the most satisfied project members in the projects where only one tool was used which indicates that Quality Center is a good enough or more than good enough tool to manage requirements.

As presented in the thesis it is not only IKEA IT which has experienced complex of problems with communication of requirements and requirement tools. In forums personnel from different companies express their frustration on the requirement tools and requests new features within the different tools. The fact that Hewlett Packard provides the possibility to link Quality Center to other tools on the market shows that there is a great request, also outside IKEA IT, and that Hewlett Packard have listened to the users wishes.

5.1 In the future

The author will present the thesis and its conclusions to personnel and consultants from both IKEA IT and IKEA Business this to visualise what barriers communication of requirements have and how they can be minimised.

The thesis can also be used as a first "learning forum" where projects that due to IKEA IT's decision in making Quality Center the recommended tool for managing requirements, tests and defects can see how other projects have used the different modules in Quality Center.

To continue the process with facilitating requirement communication Fredrik Hjorth has requested a pre-study that would investigate the possibility to link Quality Center to ClearQuest.

If IKEA and the Business Analysts choose to use another tool in the elicitation of the requirements the possibility to link this tool with Quality Center to transfer the requirements to IKEA IT must also be investigated.

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7 Appendix A

Interview guide

You and the project

Describe the project and your role in it.

- Do you have more than one role in the project?
    - How long have you had that role?
        - What kind of experience do you have of requirements management?
        - What kind of experience do you have of requirements tools?
- Where is the project members located? Local or global?
- How many are involved?

Requirement management tool

What kind of tool do you use to organise and communicate requirements?

- What kind of tool? Quality Center, Excel, other?
- Why are you using that product?
    - Who decides which product is used in the project?
- Are there any benefits with using that product?
    - Best for you or the team?
    - Timesaving?
    - Easy to communicate requirements?
    - Traceability?
    - Everyone in the project is used to working with that tool?
- What other roles in the project do you think come into contact with the requirements?
    - How do you communicate requirements with them?
- What kind of requirements do you use mostly? (User story, text....)
        - Why?
    - Does the tool support this kind of requirement?
        - How well? (very good, good, poor, very poor)
- Are there any features missing in the tool?
- Are there any unnecessary features in the tool?

If the project doesn't use Quality Center

- Do they know that Quality Center has a requirement module?
- Have they worked with Quality Center before?
- What's the reason for not using it in this project?

How would you grade the requirement tool you have been using?
(Very good, good, poor, very poor)

8 Appendix B

Survey

01 - What is the name of the project you are currently working in?

02 - What is your role in the current project?

- [ ] Business Analyst
- [ ] IT Solution Analyst
- [ ] Project Manager
- [ ] Test Manager
- [ ] Other

If other, please specify

03 - How longe have you had that role?

- ○ 0-2 months
- ○ 3-5 months
- ○ 6-11 months
- ○ 12+ months

04 - How does the project manage IT requirements?

- [ ] ClearCase
- [ ] ClearQuest
- [ ] Excel
- [ ] Projectplace
- [ ] Quality Center
- [ ] ReqPro
- [ ] Word
- [ ] Other

If other, please specify

05 - How does the project manage Business requirements?

- [ ] ClearCase
- [ ] ClearQuest
- [ ] Excel
- [ ] Projectplace
- [ ] Quality Center
- [ ] ReqPro
- [ ] Word
- [ ] Other

If other, please specify

Next >>

(Step: 1 / 3)

If requirements are not managed by Quality Center please answer the questions below.
Otherwise continue to question 9A on next page

05-Do you know that Quality Center has a requirement module?

- ◯ Yes
- ◯ No

06-Have you used Quality Center to manage requirements before?

- ◯ Yes
- ◯ No

07-What is the reason for not using it in this project?

If you have used Quality Center to manage requirements before please answer the question below.
Otherwise continue to question 9A on the next page

08-How would you grade QC as a requirements management tool?

- ◯ Very good
- ◯ Good
- ◯ Poor
- ◯ Very poor

<< Prev Next >>

(Step: 2 / 3)

09A-Who decided how the IT requirements should be managed in this project?

- ☐ Business Analyst
- ☐ IT Solution Analyst
- ☐ Project Manager
- ☐ Test Manager
- ☐ Other

If other, please specify

09B-Who decided how the Business requirements should be managed in this project?

- ☐ Business Analyst
- ☐ IT Solution Analyst
- ☐ Project Manager
- ☐ Test Manager
- ☐ Other

If other, please specify

10A-What is the biggest advantage with the tool your project use to manage IT requirements

- ○ Time saving
- ○ Traceability between requirement and test
- ○ Ease of communications of requirements
- ○ Other

If other, please specify

10B-What is the biggest advantage with the tool your project use to manage Business requirements

- ○ Time saving
- ○ Traceability between requirement and test
- ○ Ease of communication of requirements
- ○ Other

If other, please specify

11A-How would you grade the tool that the project have been using regarding IT requirements?

- ○ Very good
- ○ Good
- ○ Poor
- ○ Very poor

11B-How would you grade the tool that the project have been using regarding Business requirements?

- ○ Very good
- ○ Good
- ○ Poor
- ○ Very poor

<< Prev Done >>

(Step: 3 / 3)

9 Appendix C

Results from the interviews

Person 1
Describe the project and your role in it
- I am Test Manager in IHP2, maintenance of IKEA Home Planner one of IKEA's online tools that needs to be functional all the time. The product is bought from a supplier abroad so the developers are off-shore but the costumer (IKEA) is located in Helsingborg. The business requirements are produced by a Business Analyst as user stories, the supplier uses them to develop end we use them as test cases to test the product. In this way we have traceability between requirement and test. Since there already is a product we put the requirements as change requests in ClearQuest.

Who decides which product is used in the project?
- I do not know. I think that the requirements always have been managed this way in this project.

Do you know that Quality Center has a requirements module?
- Yes. As a Test Manager I have to use Quality Center, so I have seen the requirements module.

What is the reason for not using Quality Center as a requirements tool in this project?
- I do not know it is not my decision.

- There is no requirement process in Quality Center, only a module for organising the existing requirements so it does not help with creating requirements. And even a requirement tool does not guarantee good requirements, it does not make such a big difference which tool you use as long as the requirements are good.

Person 2
Describe the project and your role in it
- I have worked with test for eight years and as a Test Manager for six of those. Now I work as a consultant at IKEA employed by Sogeti. I am Test Manager in one COS ILSE. We will use most of the modules in Quality Center when the project started about a year ago and the members wanted to use Quality Center. Now a year later when I was involved in the project we made sure it was implemented. We are maybe five to ten people in Sweden, Helsingborg and Älmhult, I do not know how many developers there is off-shore.

What kind of tool does the project use to organise and communicate requirements?
- The project members in Sweden all have access to Quality Center. I believe that everyone in the team needs access to the requirements tool for best result. Unfortunately that is not the case at the moment, the personnel in Sweden all have access but developers do not. Therefore the requirements are sent by mail in excel or screenshots. I think that we lose Quality Center's strength by communicating this way.

Who decides which product is used in the project?
- The Project Manager (PM), as a Test Manager I can express my wishes as anyone else in the project and explain how the tools would affect my work but it is up to the Project Manager. I think it would be best for the team to use Quality Center but many only think about how they can optimise their own work.

Do you have any education in Quality Center?
- Yes, many times. In two of my previous work places Fredrik Hjorth also worked and had educations. In Quality Center When I started in this project it was my third or fourth review of Quality Center that Fredrik Hjorth held.

Are there any features missing in the tool
- It would be great to link Quality Center with ClearCase and ClearQuest. There is no feature for developing in Quality Center but if it could be linked so when a change is done in the code that will be shown in the requirements e.g. this requirement is now developed but not tested. Another feature is to be able to mail a direct link to a requirement or anything else in specific from Quality Center. So you do not have to write management/Phase1/....

To guarantee a successful project I think that the projects needs a quality manager, now many think that that is Test Manager work but I do not think so and it is too much work for the project manager as well.

Person 3
Describe the project and your role in it
- Business Analyst in one COS ILSE. The project is to combine similar products that from the beginning was one but over the years has grown into two. The requirements describe the gap between the two products. Hence in Quality Center only requirements identified via gaps are described. Most of the project members are both in the line production and in the project, I am only in the project as a Business Analyst. The project management is in Helsingborg and Älmhult and the developers' off-shore.

We started to build the requirements in Excel, when most of the requirements were specified they were imported into Quality Center. Now the requirement change management and requirement base lines are managed in Quality Center so all the identified requirements are in Quality Center.

Who decides which product is used in the project?
- The team together. Fredrik Hjorth had a lesson on how we could work with Quality Center.

Are there any benefits using Quality Center?
-All requirements at one place.
Update - via set-up in Quality Center I receive a mail every time a requirement I have created is modified.
The project can decide about the structure, how to organize and group requirements on different levels. E.g. group business requirements in releases or functions and IT requirements per IT-system and then create traceability between requirements in IT-system to releases or functions via business requirements.
Traceability between test and requirement.
Traceability between different levels of requirements, e.g. business requirements and IT requirements, and between requirements and releases.
It is also easy to re-organise requirements, moving them around between different groupings.
Get a good overview over all the requirements, business requirements traced to IT requirements traced to test.
We only have to use two tools, traceability with parent child makes it easy to trace between Quality Center and ClearQuest.

Are there any features missing in the tool
- When we made an update the status of the requirements changed resulting in that we did not know which requirements were confirmed and not.

Person 4
Describe the project and your role in it
- This was my first project as a Test Manager. I worked in the project for about a year and now I have a different role where I work with tests in many projects. We were 6 – 8 people with the project management in Helsingborg and the developers' off-shore. In the analysing period the project members' off-shore were not involved.

The Business requirements were identified by the Business Analyst and then handed over to the project members who specified the business requirements

to IT requirements. We all worked very close and first had an analysing period were we analysed the business requirements and specified it to IT requirements. The team had weekly meetings were we discussed and analysed requirements.
To communicate and manage requirements we had user stories that were written in Word documents and then organised by feature in ClearCase. Those were also used as test cases which gave us traceability between requirements and tests. This duplicates the testers work since they have to insert the test cases in Quality Center. In Quality Center I understands that the requirement can be used as a test case and that would save time.

Are there any benefits with this way of managing requirements?
- I cannot compare with anything else since this is the only project I have been in and therefore the only way I know how to organise requirements.

I think that is best if everyone in the team is involved in specifying the requirements, then the whole team has the same understanding and knows why the requirement is written as it is.

To use the requirement module I, and maybe the rest of the project members, needs education in Quality Center. Now I only know how to use Quality Center in my work as a Test Manager.

What other roles in the project do you think come into contact with the requirements?
- Everyone, it is best if everyone knows the requirements from the beginning. In that way there are more people analysing and viewing the requirements, hopefully eventual defects are discovered early.

Do you know that Quality Center has a requirements module?
- Yes. I have used Quality Center as a Test Manager but I have not used the requirements module.

Person 5
Describe the project and your role in it
- I have been Test Manager for two years. Before that I had other technical roles at IKEA now I am Test Manager in iSELL, IKEA's sales and service application. We are 20-30 people, project management and some developers in Helsingborg and some developers off-shore.

Now the requirements are in word documents in ClearCase, a year ago they were organised by release and that did not work. If a requirements was changed it was difficult to find the right requirement. Now the new

requirements are organised by feature but I would like to use Quality Center for requirement management as well since it facilitates testing.

Are there any benefits with this way of managing requirements?
- As Test Manager I do not see any advantages with ClearCase. From a test perspective it would be better if the requirements were in Quality Center as well. When the project uses many different tools it is harder to get an overview.

Do you have traceability between requirements and tests?
We have the same structure in Quality Center as in ClearCase for manual traceability.

Who decides which product is used in the project?
- The project members. Fredrik Hjorth informed us about how we could work with Quality Center but since the project still has to use ClearQuest for work orders and the Business Analyst did not want to duplicate his work we did not change tool. If we were able to link Quality Center to ClearQuest in a reliable way so that work orders could be done from Quality Center maybe the other project members would change their mind to. Many of the project members are used to work the way we do now therefore it may be difficult to change.

Do you have any education in Quality Center?
I have learned Quality Center by myself but a small education may help me know all advantages in Quality Center. I have seen that you can request an education so I might do that.

Do you know that Quality Center has a requirements module?
- Yes. As a Test Manager I work with Quality Center all the time and would prefer if the requirements were in Quality Center as well.

Person 6
Describe the project and your role in it
- I am new at IKEA and have only worked as a Business Analyst in onPOS for sex weeks. I have worked as a consultant and project manager for fifteen years and have experience from both requirements management and Quality Center. Most recently I worked at a company were we used Quality Center but in a different way from how IKEA uses it.

The onPOS project is a new payment system that will be used in all IKEA stores. The project chose Canada as a pilot country and now we are developing new versions for other countries. It began as a small project with only a few members but it grew bigger, now it is divided into smaller projects

again. We are 30 people at IKEAIT Helsingborg, two of Business eleven members are located abroad the rest of us in Helsingborg. The suppliers and their developers are located abroad.

The product is bought from a global company so we started with all the existing functions in the suppliers user guide as requirements and added requirements or wrote new requirements against the existing functions.

What kind of tool does the project use to organise and communicate requirements?
- Now they are in Quality Center, at first they were in Excel but previous Business Analyst wanted a tool to get history, traceability and tree structure so he changed it to Quality Center.

Are there any benefits with using Quality Center?
- History - You can see who has changed things and when.
Search - You can search for a specific requirement.
Link - You can link requirements to each other, to defects and attach documents, e-mails etc.
Admin - It is easy to administrate the requirements.
Status - (It can be done in excel as well) everyone has the same definition on e.g. complete.
Process - It gives you an overview over the process and where you are in it.

What other roles in the project do you think come into contact with the requirements?
- Everyone are involved here (at IKEA), I do not know how it is at the suppliers.

How does the project communicate requirements with these roles?
-Business uses Quality Center
IT uses ClearQuest
Wincore uses ATSE
Test uses Quality Center
Between test and the Business Analyst there is a lot of mail conversations with Quality Center exports to excel were we communicate what the Business Analyst has changed in the new version.

- It is important that everyone agree on how detailed the requirements should be. We as Business Analysts at Business gets instructions that the requirements should not be detailed e.g. as a cashier I want to do a rollback. But I understand that this is not detailed enough for the testers and developers. The project was initially set up so that the requirements should work with any

POS system and can therefore not be detailed about how the functionality is implemented but I think that the business requirement should be enough to have a discussion with the supplier and see what kind of standard solutions they have. If they do not have a standard solution, the experts on the system, i.e. the supplier should suggest a solution that Business can approve. Maybe then, more detailed requirements can be created.

I think that this is a way of saving money, if IKEA has a detailed requirement and the suppliers does not have exactly this product they have to develop it and that cost much more than a standard solution that might work just as well.

Are there any features missing in Quality Center?
- You cannot freeze it, if the testers are working on version 3 and the Business Analyst are changing requirements for version 5 the attachments and links are changed in version 3 as well. These results in that the testers have made a new project in Quality Center were the only have the requirements for version 3 and run the tests on them. Since the same requirement has different id-number in the testers "project" and the Business Analysts it is difficult to refer to a specific requirement when testers and the Business Analyst communicate. We and the testers first have to explain the requirement so we know that we talk about the same one before we can solve any questions.

It would be great to have a knowledge centre with other projects that have used Quality Center to learn how they manage the requirements. Then other projects do not have to make the same mistakes.

Person 7 and Person 8
Describe the project and your role in it
- When we took over the NCP project we were Business Analyst and Test Manager now we both have new roles in other projects. We were 4 members in Helsingborg but do not know how many developers there were curse they were off-shore.

What kind of tool does the project use to organise and communicate requirements?
- Quality Center, when we took over there were requirements in both ReqPro and Quality Center. Since ReqPro did not have a future at IKEA IT and we wanted to have traceability from the requirements to the tests we chose to move all requirements to Quality Center. Since the project used Quality Center before there were no problems in justifying our decision.

Are there any benefits with using Quality Center?

- We did not have to use two different requirements tools and all of the project members had access to the requirements. But we do not know if they had that much use of them since they were mostly goal requirements. In the end the developers themselves created more detailed requirements and added them in Quality Center.

The main reason for us using Quality Center was the traceability. I (Person 7) had many thoughts on how to have traceability from business requirements via IT requirements all the way to tests unfortunately they were not all implemented. To have the traceability that we wanted we would have to specify the requirements more and have more levels of the requirements so that all project members could use them. The business requirements from IKEA demand would also have to be added.

Are there any features missing in Quality Center?
- The ability to connect Quality Center with other tools e.g. if you want to do a change request you have to use three different tools. Therefore we choose not to use that feature in Quality Center.