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IS/IT REQUIREMENTS ELICITATION AND SPECIFICATION PROCEDURE ASSESSMENT WITHIN A UK GOVERNMENT SERVICE ORGANIZATION

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ABSTRACT

Requirements engineering is concerned with the identification of the goals to be achieved by the envisioned IS/IT system. The processes involved include three interrelated functions: requirements elicitation, specification and validation. This study represents an exposition of requirements elicitation/specification concepts and challenges targeting the Government Sector. Groups of Project Managers, Business Analysts and users of IS/IT systems have been surveyed and interviewed and the data on 19 projects is analyzed to ascertain experiences and problems when eliciting and specifying requirements. A 17 factor assessment model is suggested and used for evaluation of the requirements specification documents of the project cases studied. The research concludes that there is considerable doubt within the Government Sector studied as to why it is necessary to produce a requirements specification in the first instance. The design and implementation of an IS/IT system can only be as good as the statement of requirements and a lot more resources and attention need to be channeled to this very important task of requirement specification as part of the project management process.

Keywords: *project management, IS/IT, requirements, specification, elicitation, procedure*

INTRODUCTION AND BACKGROUND

Review of the practice documents, academic journals and publications on project management of IS/IT projects reveals the fact that in spite of all the research work already done in this domain, there are serious issues in the application of requirement elicitation and specification in public sector organizations [1,2, 5,6,7,10,13 and 16].

The Organization for Economic Co-operation and Development (OECD) Public Management Policy Brief (March 2001) highlighted that:

> "*Many governments experience problems when implementing IT projects. Moreover, governments are not alone in failing. Evidence suggests that private sector companies have similar problems...*"

In the public sector, civil servants must take into account many factors that may influence requirements specifications. In Government, procurement periods tend to be longer, more focused on cost than business value, closely monitored by the public and the media, constrained by government and EU legislation and regulations, and managed in a risk averse culture. Also it is true that Government projects are more difficult to manage because of their scale and complexity and their inevitable susceptibility to sudden changes in policy and legislation.

Spending on public sector IT projects in the UK is running at above £7.5 billion per year. While the Government is the biggest computer user in the country, major projects at key Government departments have ended in expensive and embarrassing failure [9,10]. The extent of inefficiency involved in providing public sector IT has been documented in a number of reports and by watchdog bodies such as the Public Accounts Committee and the National Audit Office [10].

Announcements from Government on causes of IT failure and remedial actions have nearly failed either to clarify the situation or provide a basis for improvement. The UK Cabinet Office has produced a report "Successful IT: Modernizing Government in Action" [6] to provide a firm basis for improved practice in Government IT. However, there is little reference to the requirements engineering process that has been identified by a number of different researches as one of the main reasons for project failure [32]. Hoffman and Lehner [19] claim that:
"*Deficient requirements are the single biggest cause of software project failure…..*"

RESEARCH METHOD AND DATA COLLECTION

The research was conducted in three phases: literature review, data collection and analysis. In order to collect data regarding IS/IT requirements elicitation and specification and to establish the procedures used in practice it was decided to use multiple data collection methods incorporating case studies, questionnaires and informal interviews. Whereas the focus of this paper is the analysis of the finding from the case studies a summary of the findings based on the questionnaires and interviews also is presented.

Data on a number of IS/IT project cases was collected, reviewed and analyzed. These projects belonged to the computer departments within the service organization under review. Although case study research could have been used in its own right [3,17], a multi-method approach, 'triangulation', was adopted in which the same dependent variable were investigated using multiple additional procedures. This multi-design approach was intended to provide a more holistic view of the dynamics of requirements elicitation and specification [17,35, 26].

As not all the data required could have been gathered in the case studies, two questionnaires also were designed and sent. One set of questionnaires were sent to the forty-two IS department of the organization in England and Wales. The questions were based around what methods were currently in use for requirements elicitation and specification, what problems were encountered when using them and whether the level of success of the projects was assessed after implementation.

The other set of questionnaires was sent out to non-IT users within one specific department only and questions were based around these people's perception of user requirements and the difficulties that arise formulating them. The questionnaires were randomly sent to all grades and ranks, but care was taken to ensure that all users had been involved at some time with the procurement of information technology.

The informal interview and discussions were organized with IT Project Managers regarding requirements specification and elicitation, and aimed at obtaining a first hand indication as to how much of an issue this area was for practicing Project Managers. The discussions were unprompted and the managers concerned were asked to share their experiences of writing specifications. Questions were asked systematically without setting an interview, when the opportunity arose.

ANALYSIS OF THE DATA FROM THE PROJECT CASES STUDIED

In order to analyze and critically evaluate the project specifications received/collected a framework for comparative analysis of the cases was needed. Based on the information gathered through the literature review it was established that sound inclusion of the following factors and criteria could improve the quality of a requirements specification [4,8,11,12]:

- Introductions that outlines the purpose of the document, scope, definitions, glossary and overview of the requirements specification;
- Outlined objectives at different levels;
- Detailed functional requirements;
- Detailed non functional requirements;
- Design and implementation constraints;
- Grading/prioritization of requirements;
- Statements of what a system should do rather than how it should do it;
- Detailed Inverse requirements;
- Quality and project management requirements highlighted;
- Each requirement written in detail;
- Legislation, assumptions and dependencies documented;
- Overview of current system, technology, problem/risks and organization structure;
- Diagrams that are clear and can stand alone without supplementary text provided;
- Clearly specified user catalogue;
- Each requirement identified with a unique identifier;
- Structured presentation (readers able to find information easily) and
- Language is simple, clear, precise and unambiguous.

As the factors listed above do not have the same degree of importance, a weight was arbitrarily assigned to each factor:1 – Not required, 2 – Useful, 3 – Desirable, 4 – Highly desirable and 5 – Essential. Nineteen requirements specification cases were scrutinized, analyzed and evaluated using the requirements specification framework/assessment matrix. The cases received were for bespoke products as well as commercial-off-the-shelf (COTS) systems. The evaluation framework consisted of the key factors listed above, and each one was graded using the Likert Scale (1 = Poor, 2 = Fair, 3 = Good, 4 = Very Good, 5 = Excellent). Each factor could, therefore, be given a rating of 1-5. The result was then multiplied by the weighting to ascertain the total score. Table 1 illustrates the authors allocated weighting for each factor and the maximum value each factor can score.

Table 1: Framework of key attributes and weightings for requirements specification

Item	Factor	*Weighting*	Max Score
1	Introduction – Purpose of the requirements document, scope, definitions, acronyms and abbreviations, references, specialized terms defined and overview of the requirements specification.	5	25
2	Objectives at different levels are outlined. Project without clear goals will rarely achieve their targets clearly.	4	20
3	Identify functional requirements (Requirements that specify a function that the software system be capable of performing).	5	25
4	Identify Non functional requirements (Non functional issues such as performance, reliability, efficiency, usability, portability, security and interfaces).	5	25
5	Identify design and implementation constraints (design constraints such as specifying specific hardware and software or specific architectures, i.e. client server. Implementation requirements when using C++ or using a specific GUI builder like Visual Basic).	2	10
6	Grading/Prioritization of requirements within a Requirements Catalogue. Requirements will have to be prioritized to ensure that the most important requirements are completed.	3	15
7	Statements of what a system should do rather than a statement of how it should do it.	5	25
8	Identify Inverse requirements (Requirements that specify what the software system should not do. Usually found in safety or security requirements).	2	10
9	Identify Quality and project management requirements (Time, Cost, Resource, Quality).	2	10
10	Detail requirements.	5	25
11	Legislation, assumptions and dependencies have been documented.	4	20
12	Overview of current system, technology, problems/risks, organization structure. Requirement background information or history. Complex requirements may be better understood by their history. How the requirement arose often explains much about it.	2	10
13	If any diagrams are used in the specification they are clear and can each stand alone without supplementary text.	4	20
14	User Catalogue is clearly specified. This helps better design taking end users into consideration.	2	10
15	Each requirement has a unique identifier against it.	3	15
16	Readers can easily find information. The structure must assist the understanding. The specification should be structured logically so that its sections do not overlap and the requirement is fully defined.	3	15
17	Language is simple, clear, precise and unambiguous.	5	25
Maximum possible score			**305**

The tables below (Table 2 and Table 3) detail the outcome of the assessment of the requirements specification cases. The column labeled 'Project' lists all the cases, i.e. Project 1 (P1), Project 2 (P2), etc. and the 17 key attributes are listed 1-17 with a total score at the end. The initial scores, excluding the weighting, have been listed under S1 – S19, and the total score that includes the weighting is shown in the column with Sc as the heading. Projects P1 – P10 represent the IS projects from similar departments and sections within a government organization across the UK. The other projects, P11 – P19 were received from one department but written by different Project Managers/ Business Analysts.

For better analysis and discussion on the data the following classification is suggested:

- $0 \leq Sc \leq 100$ Poor
- $100 \leq Sc \leq 150$ Fair
- $150 \leq Sc \leq 200$ Good
- $200 \leq Sc \leq 250$ Very good
- $250 \leq Sc \leq 300$ Excellent

A maximum of 305 can be scored for each project specification.

Table 2: The analysis of ratings of requirements specifications for 10 Case Studies from different departments

Project	**Factors**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**Score**
Weight		**5**	**4**	**5**	**5**	**2**	**3**	**5**	**2**	**2**	**5**	**4**	**2**	**4**	**2**	**3**	**3**	**5**	
P1	S1	3	2	3	3	3	2	3	2	2	3	2	4	4	1	4	3	4	178
P2	S2	4	2	4	4	3	3	3	3	1	3	3	3	4	1	4	4	3	196
P3	S3	4	2	3	3	3	3	4	3	4	4	3	4	4	1	5	4	4	212
P4	S4	2	2	2	2	2	4	3	1	1	2	1	1	1	1	3	1	3	122
P5	S5	1	2	1	1	1	1	2	1	1	1	1	1	3	1	2	1	3	91
P6	S6	3	1	2	2	1	1	3	1	1	3	1	3	3	1	4	2	3	135
P7	S7	2	1	1	1	2	1	1	2	1	1	1	2	1	1	1	1	1	72
P8	S8	1	1	2	2	1	1	3	1	1	3	1	1	1	1	4	2	3	113
P9	S9	2	2	3	3	2	2	3	4	1	2	1	2	1	1	3	3	3	140
P10	S10	1	4	2	1	2	1	3	1	1	2	3	1	1	1	4	1	3	122

Table 3: The analysis of ratings of requirements specifications for 9 Case Studies from the same department

Project	**Factors**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**Score**
Weight		**5**	**4**	**5**	**5**	**2**	**3**	**5**	**2**	**2**	**5**	**4**	**2**	**4**	**2**	**3**	**3**	**1**	
P11	S11	2	2	3	3	2	1	3	1	1	3	1	3	3	1	2	3	4	136
P12	S12	2	1	3	3	1	1	3	1	1	4	1	1	1	5	5	2	4	149
P13	S13	3	3	4	3	1	5	3	2	2	4	4	3	3	5	4	3	4	207
P14	S14	3	3	3	3	1	4	3	2	2	3	1	2	3	5	4	4	3	178
P15	S15	3	3	3	3	1	1	4	2	2	3	1	2	1	1	4	3	1	148
P16	S16	3	3	3	3	1	5	3	2	2	3	3	2	3	5	4	2	1	161
P17	S17	2	2	3	3	1	3	4	2	2	3	3	2	2	5	4	3	3	163
P18	S18	3	3	3	3	1	5	4	2	2	4	3	3	2	5	4	3	3	194
P19	S19	3	3	3	2	1	1	3	1	2	3	1	1	2	1	4	3	3	145

Three specifications scored poor, under 100, and the majority scored fair. None of the specifications scored excellent and only one scored very good. This is far from an optimal situation as the distribution is skewed towards the lower end of the scale.

QUALITATIVE ANALYSIS OF THE PROJECT CASES

It is interesting to know that several of the specifications were written for the same project but they were developed by similar departments of the organization at different locations. Each project was compared with that of similar ones coming from different part of the UK. Projects labeled 5,6,7 and 13 were nearly the same and the specifications created for them could be collated under the umbrella of *project A category* whereas projects 1and 2 could be labeled as project B and projects 3,9,11 and 17 are labeled as C. The A project was a work flow management application.

From the four specifications received for this category, projects 5 and 7 scored very low as no objectives were explicitly outlined. This could lead to so much difficulty once the system goes live and assessment of the performance of the system would be done. How would the Project Team determine if the objectives had been met once the system went live? Both the functional requirements and non-functional requirements were vague, ambiguous and difficult to understand.

There were no design and implementation constraints, or any grading/prioritization defined, and the statements were poor and did not state what the system should do. Inverse requirements and legislation issues or quality requirements were not specified. Inverse requirements are those that specify what the software system should not do. There were no diagrams or user catalogue included and requirements did not even have a unique identifier to track them through the project life cycle.

One of the requirements specifications, P6, had a good introduction and there was a glossary present to explain the abbreviations and acronyms. The objectives were outlined at the beginning of the document and the functional and non-functional requirements were explained clearly. The overview of the current system was very well presented, and included diagrams that aided in the understanding. However, the specification did not identify design and implementation constraints and did not include any grading/prioritization. Inverse and quality requirements were also not included.

The specification produced for P5 did not score high. The introduction was briefly explained in just one paragraph and there was no glossary included to explain the abbreviations and acronyms. Only four objectives were identified, and they were not explained in much detail. Functional and non-functional requirements scored very poorly. Design and implementation constraints were not specified and there was also no form of prioritization.

Each requirement lacked detail and legislation issues were not even mentioned. There was no overview of the system but a memorandum was attached to the document briefly describing the new central submissions process. The requirements specification did, however, score highly for the diagrams. These were very clear and explained the workflow in more detail.

Project B Category

It is a requirement for a particular department within the organization to respond as quickly as possible to reported incidents. The objective of this system is to ensure that incidents are logged and routed to the most appropriate personnel. Two specifications for this particular project were received and analyzed, P1 and P2.

P1 produced a good introduction, including a good overview of the current system but there did not appear to be an overview of the required system. There also appeared to be few objectives outlined. There was also no evidence of grading/prioritization, however, words were used such as 'must' or 'should' to express the requirements. The document scored particularly well in identifying design constraints and providing an overview of the current system, using good clear diagrams. The requirements specification was a rather detailed document that consisted of a number of pages, which meant that information was difficult to find. It did not appear to be structured logically, there were too many sections, and there was not enough explanation about the project.

P2 scored particularly high in identifying non-functional requirements and design and implementation constraints. Specialized terms were not outlined in a glossary but they were explained in detail in the introduction. The document was separated into three sections that were 'functional', 'non-functional', and 'technical architecture'. This ensured that the specification was easy to read and understand and explained the workflow extremely well. Each requirement within the document was graded 'E' for Essential, 'HD' for Highly Desirable, and 'D' for Desirable. This was recorded next to the requirement, as opposed to recording them in a separate 'Requirements Catalogue'. Entity Relationship Models (ERM) were also included in the specification to ensure the supplier understood clearly the requirements.

Project C Category

The objective of this project is to enable simpler access to corporate incident information held on proprietary databases to assist incident prevention and problem detection. The ability to analyze all structured information will enable links and relationships to be identified. The effective use of technology will assist intelligence led operations and enable good problem analysis. In addition, more 'open' access to incidents data should enable the involved departments to work more effectively with their partners.

The specification from P3 was extremely well written and scored very good. Most attributes scored 'good'. The introduction was good and included a background to the project and purpose of the system. Objectives were defined in detail, and functional and non-functional requirements were specified clearly, including issues such as security and interfaces. Each requirement was graded as 'Mandatory', 'Desirable', or 'Highly Desirable' but were not included in a separate requirements catalogue. Each requirement was significantly detailed and was understood easily. A good overview and history was provided which aided the understanding. All the diagrams produced were very clear and enhanced the requirement.

P9 provided a fair introduction but acronyms and abbreviations were not defined. The objectives were briefly stated but only referenced in the introduction. The functional and non-functional requirements were detailed, especially the security requirements. Inverse requirements were also specified in the document in a section called 'Threat Summary'. The document, however, did not identify any design and implementation constraints, quality requirements or any grading/prioritization. Legislation requirements also appeared not to be present. There were no diagrams included or user catalogue, which brought down the overall score. In summary, the specification was well written and the language was clear, precise and unambiguous, but the objectives needed to be expanded to provide more detail.

The P11 specification was produced about five years ago. The introduction was brief and so were the objectives. Functional and non-functional requirements were detailed clearly and stated what the system should do rather than how it should do it. The document did not include any design and implementation constraints, inverse requirements, quality requirements or grading/prioritization. This is the reason why the specification did not score as high as some of the others. The document also presented an overview of the current system and some background information that aided in the understanding of the document. Diagrams were also used which were clear and could each stand alone without supplementary text. It was also well structured.

The P17 specification did not score well. The introduction and objectives were outlined but it was evident that there was not much user involvement. Functional and non-functional requirements were outlined, but not in detail. Design constraints were not included and there did not appear to be a completed requirements catalogue. Quality and inverse requirements were graded as 'fair'. The document did include an overview of the current system but did not outline any problems or risks. In summary, it is evident that users were not involved in the production of the specification.

FURTHER ANALYSIS OF DATA

The average grade for requirements specifications in the sampled data was 144. The ideal score was 305. This indicates that requirement specifications produced within these government departments only provide a 47% fit against the suggested framework. The table overleaf (Table 4), shows the total percentage achievements. It also highlights the percentage fit against the suggested framework, namely poor, fair, good, very good and excellent specification. The assessment shows a clear problem with regards to requirements/ specifications produced.

The table highlights that only two specifications provided over a 66% fit. Two specifications scored poor with less than a 33% fit. The average percentage has been calculated as 47%. This indicates that on average these departments produce 'poor' specifications that provide less than a 50% fit. The highest score was only 71%. The graph overleaf (Figure 1) illustrates the percentage fit against the requirements framework maximum score.

In summary, the majority of specifications produced provided less than 50% fit against the requirements framework. Most specifications produced are not at a particularly high standard, which could lead to many systems not actually delivering what the users require, and falling into disuse.

Table 4: Percentage fit against the suggested requirements specification framework

	Project	Score(Sc)	Percentage
Poor if 0% ≤ Sc ≤ 33%	P7 P5	72 91	24% 30%
Fair 33% ≤ Sc ≤ 50%	P8 P4 P10 P6 P11 P9 P19 P12 P15	113 122 122 135 136 140 145 149 148	37% 40% 40% 45% 45% 48% 48% 50% 50%
Good if 50% ≤ Sc ≤ 66%	P14 P16 P17 P1 P18 P2	178 161 163 172 194 196	59% 53% 53% 58% 62% 66%
Very Good if 66% ≤ Sc ≤ 83%	P13 P3	207 212	67% 71%
Excellent if 83% ≤ Sc ≤ 100%	None	None	0%

When the individuals were scrutinized for standards, the problem persisted. Some factors received better scores but overall the performance was less than desired. Table 5 shows the factors that received high scores (strength), and the factors, which were not presented well (weaknesses).

Table 5: Summary of scores for each factor

Factor	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Score
Maximum	25	20	25	25	10	15	25	10	10	25	20	10	20	10	15	15	25	305
Average	11	9	13	13	3	7	15	4	3	14	7	4	9	4	11	7	15	144
% Fit	43	45	53	53	30	50	59	40	30	55	36	40	45	40	71	48	59	47

P19 requirements scored relatively well. The introduction to the project was excellent and was really easy to read and understand, particular as the author did not have an understanding of this project. Objectives were detailed and provided the project with clear goals. Functional and non-functional requirements were specified in detail and were clear and unambiguous. The document, however, did not identify design and implementation constraints or include a requirements catalogue including all the grading. Legislation was not made reference to and there did not appear to be an overview of the current system.

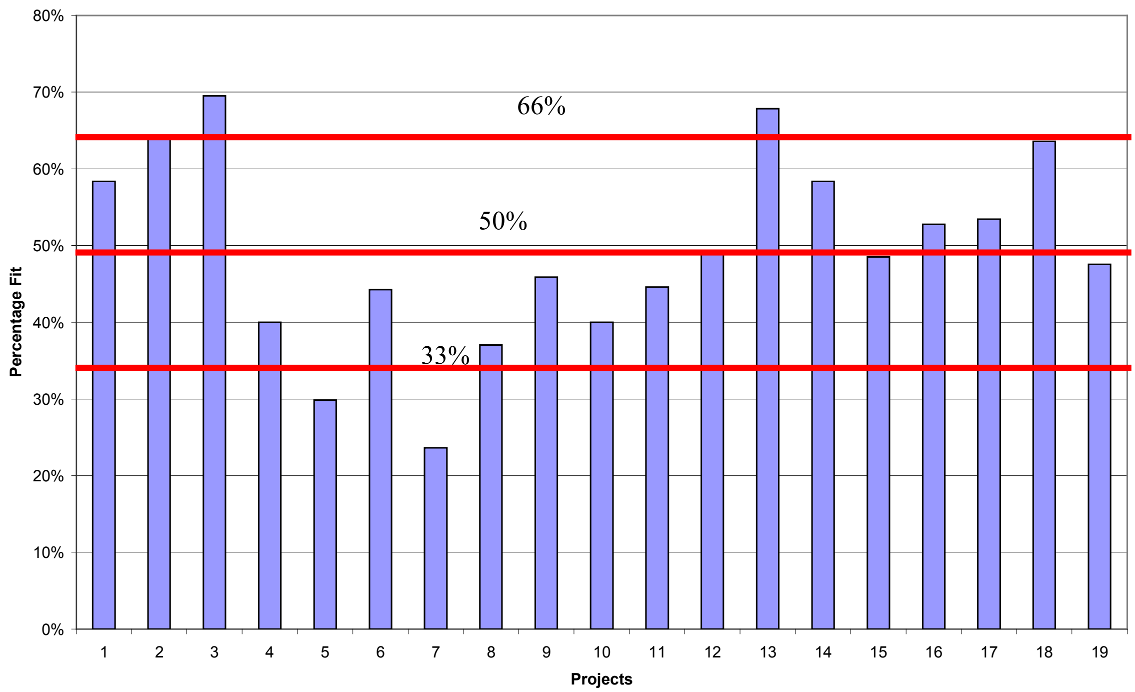

Figure 1: Final percentage fit against Requirements Framework

The data shows that on average none of the factors, with the exception of factor 15, scored over a 60% fit. The highest scores were for factor 15 (71%), and factor 17 (59%) for each requirement having a unique identifier and the language being clear, precise and unambiguous. Factors 5 and 9 only scored an average of 30% fit. These were for referring to design and implementation constraints, and identifying quality and project management requirements. This indicates that these are the factors that continually are being left out of a specification. Factor 11 only averaged 36% for identifying legislation requirements. Factors 12 and 14 only averaged 40% for providing an overview of the current system and producing a user catalogue.

It is interesting to note that not one of the requirements specifications supplied included a requirements catalogue that prioritized/graded each requirement in a separate document, or a user catalogue, that outlined the users of the system. Only one department consistently used a user catalogue. Many specifications included the grading/prioritization next to the actual requirement in brackets. This appeared to be a lot clearer and significantly reduced the amount of paperwork produced. Unfortunately, within a requirements catalogue each requirement needs to be repeated, and then given a grading. If the project is rather complex this will create significant paperwork.

The majority of specifications did not produce any inverse requirements. Quality and project management requirements were often not submitted. The people responsible for requirement specification should be aiming or trying to keep hold of a quality standard (e.g. ISO9001) and reference should be made to these types of standards.

The organization's security legislation should be included. Many suppliers that submit an 'expression of interest' are not always aware of the legal demands of these departments and are therefore not clear on the current legislation issues. Security wasn't highlighted in many requirements specifications. In fact, only a few made reference to security. This is surprising as a majority of the specifications had made reference to interfaces with other systems but had not included the security implications. Only one department had included a separate security policy document that was made reference to in the requirements specification. It can be argued that these issues are included in the Risk Log as opposed to the requirements specification to ensure that the Project Board is aware of all the security implications and how they will be addressed.

Analysis of data from Questionnaires and Interviews

The collected data from the questionnaire shows that a number of techniques are used to gather requirements, namely interviewing, board blasting, observation, prototyping and modeling. Interviewing was the most popular and the majority of departments allow the Project Manager/Business Analyst to select the most suited method. Other tools such as data flow diagrams and conceptual models are used to identify project needs. One department commented that the use of data flow diagrams form the basis of the requirements specification.

It came as no surprise that the majority of the departments felt that the requirements phase contributed most to system errors. However, not all departments produced requirements specifications (only 71%).

Interestingly, only one office used a formal IEEE standard for producing a specification. Another department commented on the use of a standard template, adjusting the headings accordingly. A few departments had 'interfaces' as a major heading but not 'security'. This is a concern, as data held on different systems have different levels of security and must therefore be references in the requirements specification.

It was evident from the 92% response for the question about problems respondents encountered when writing specifications, that many Project Managers/Business Analysts experience problems. Many managers found it difficult eliciting the requirements and felt that users did not contribute enough. Other respondents felt that managing user expectations and project scope creep were difficult.

Project Managers were also asked how many of their projects provided an 80% or more fit. The majority (42%) selected 80-100%. However, only 76% of them stated that they conduct post implementation reviews. This indicates that a number of respondents who answered this question did not base their answer on any quantifiable results, i.e. following a post implementation review.

All departments used English statements within the requirements specification. Other languages used are graphical form (35%), mathematical language (16%), Unique Modeling Language (14%) and pseudo code (12%). Research suggests that to be most effective, formal specification must be supplemented by a good deal of supporting, informal descriptions.

Analysis of data from just one Organization

A total of 40% of users had been required to use a computer system without being consulted. This indicates that a vast number of users are not involved in the initial stages of an IS/IT project, i.e. defining the requirements. In fact, only 8% stated that they are normally involved/consulted in specifying requirements for a system. Most respondents did not know who was responsible. A total of 76% of respondents did not have any experience in writing specifications.

An assessment was done into how respondents felt about the Business Analysts/Project Managers they worked with. Most agreed that they were good listeners, gained a good grasp of the requirements and documented them in detail. A small percentage of users did feel that the specification was too detailed and felt that they used too structured techniques. However, most of the respondents felt that requirements specifications are a must and should be completed irrespective of how much time is required to produce one, which contradicts their last statement.

One of the most important goals of elicitation is to find out the problems that need to be solved, and hence identify system boundaries and objectives. A total of 50% of users found this difficult to do. There could be a number of reasons for this. It may be due to poor communication skills between the user and analyst. Although the majority of users felt that it could be due to their lack of IS/IT experience that affected the way they try to specify their requirements.

There were a number of different methods that were used for gathering requirements such as interviewing, board-blasting, questionnaires, process mapping, thinking aloud, scenarios and workshops. There was not one particular method that was a clear leader.

It is a concern that 24% of respondents felt that it was a waste of time writing requirements, if they liked a product that had been demonstrated. This highlights that there is a general lack of understanding amongst users regarding the importance of the specification, and that they are prepared to buy a product with no specification just because it appears to look good and had been demonstrated by a good sales person. The majority of respondents felt that only 40-60% of IT solutions delivered met the requirements expected. This is not surprising as most users felt they were not involved in the requirements specification.

SUMMARY AND CONCLUSION

In summary, the majority of specifications evaluated from different organizations within these service departments provided less than a 50% fit against the requirements framework. Only two specifications provided a 66% fit, and none provided over an 83% fit. Design and implementation requirement, and project management requirements were often not included (only 30% of specifications provided this functionality). Legislation requirements were also forgotten and many specifications did not provide an overview of the current system.

If requirements have not been specified, are vague or even wrong it is impossible for the developers to provide the most appropriate software. It is recommended that much more effective requirements and specification phase be built into the project life cycle to reduce these risks.

Sometimes the requirements stage is rushed for the delivery of the system on-time and within budget. On the other hand if the requirements process is not given a time limit, it could go on forever and experience scope-creep. A good Project Manager/Business Analyst must control this. Correct requirements are the foundation to build the IS/IT system, and if the requirements are not correct, the system will be built with many problems. It is also evident that more training is required within these departments with regards to producing requirements specifications.

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