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A Requirements Engineering Method for COTS- Based Systems Development

Cornelius Ncube

Submitted for Examination of Doctor of Philosophy

Centre for Human-Computer Interaction Design

School Of Informatics

City University

London

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Appendix 3a: Sample acceptance test for Requirements Management used in the case study that is described in section 3.2

This third acceptance test explores how well the supplier's product meets requirements related to requirements management. Again there are a number of tasks which should be followed in sequence.

Task 3(T3)

T31: The product shall have configuration management and version control facilities applicable to both the entire data base and individual requirement statements.

Instructions

Demonstrate the configuration management and version control facilities for the product data base. First, make changes to one requirement statement, store these changes, then demonstrate that previous versions of the requirement statements are still held and available in the data base. Second, make changes to several requirement statements at once and store these changes. Demonstrate the previous version of the entire data base.

Checks

Use the following checks to rate the product's fit to diverse requirements, where 1=very poor fit and 7=excellent fit. Remember that, in essence, each check is a more detailed requirement statement which the product should meet.

3.1a: The product shall store all versions of each requirement statement in the data base.

Rating: 1--2--3--4--5--6--7

Comment:

3.1b: The product shall link all versions of each requirement statement in the data base.

Rating: 1--2--3--4--5--6--7

Comment:

3.1c: The product shall provide a separate comments field to record the justification of all changes to each requirement statement in the data base.

Rating: 1--2--3--4--5--6--7

Comment:

3.1d: The product shall provide a function to group requirement statements which shall be handled as a single entity for version control.

Rating: 1--2--3--4--5--6--7

Comment:

3.1e: The product shall provide full functions for configuration management, including capabilities to manage changes to different requirement statements at different rates in the data base.

Rating: 1--2--3--4--5--6--7

Comment:

3.1f: The product shall record authorisations to all changes to requirement statements in the product data base.

Rating: 1--2--3--4--5--6--7

Comment:

3.1g: The product data base shall maintain change histories which record all changes to the contents of the data base.

Rating: 1--2--3--4--5--6--7

Comment:

3.1h: The product data base shall maintain records to users which make all changes to the contents of the data base.

Rating: 1--2--3--4--5--6--7

Comment:

3.1i: The product data base shall enable the user to 'rerun' changes to the data base contents using the recorded changes histories, to detect possible discrepancies in the data base contents.

Rating: 1--2--3--4--5--6--7

Comment:

3.1j: The product shall allow the user to reconfigure the products to improve the fit between the product's functions and user's requirements.

Rating: 1--2--3--4--5--6--7

Comment:

T32: The product shall restrict user access to the data base to individual requirement statements according to the user's status and the requirement statement's security levels.

Instructions

Set up a new user who can access the whole data base. Set up a second user with access to certain levels of requirement statements in the data base. Demonstrate restricted retrieval of requirement statements according to user status and level of requirement statements.

Change the user's access levels. Again demonstrate restricted retrieval of requirement statements according to user status and level of requirement statements.

Checks

3.2a: The product shall permit the data base manager to generate a user-identifier which gives user access and change privileges to requirement statements in the data base according to the status of the requirement statement and the user.

Rating: 1--2--3--4--5--6--7

Comment:

3.2b: The product shall permit the data base manager to change user-identifiers which give user access and change privileges to requirement statements in the data base according to the status of the requirement statement and the user.

Rating: 1--2--3--4--5--6--7

Comment:

3.2c: The product shall restrict access to requirement statements according to the statement's level.

Rating: 1--2--3--4--5--6--7

Comment:

3.2d: The product shall restrict access to requirement statements according to the user-identifier level.

Rating: 1--2--3--4--5--6--7

Comment:

3.2e: The product shall restrict changes to requirement statements according to the statement's level.

Rating: 1--2--3--4--5--6--7

Comment:

3.2f: The product shall restrict changes to requirement statements according to the user-identifier level.

Rating: 1--2--3--4--5--6--7

Comment:

3.2g: The product shall provide different sophisticated levels of requirement statement change and access. The product manager shall manage these levels.

Rating: 1--2--3--4--5--6--7

Comment:

3.2h: The product shall provide sufficient levels of security to protect the user-identification and security-levels system.

Rating: 1--2--3--4--5--6--7

Comment:

3.2i: The product shall allow the user to reconfigure the products to improve the fit between product's functions and user's requirements.

Rating: 1--2--3--4--5--6--7

Comment:

T33: If one requirement statement in the product data base changes, the product can inform the user of all other requirement statements linked either directly or indirectly to that requirement.

Instructions

Retrieve the requirements statement number 1.#.2.4.2.1.1.3.2.1.5... Change this requirement statement. Show statements which have links to other requirement statements in the data base. Demonstrate all useful change notification mechanisms to owners of other requirement statements.

Checks

3.3a: The product shall show all requirement statements which are affected by the requirements change.

Rating: 1--2--3--4--5--6--7

Comment:

3.3b: The product shall show all owners whose requirement statements which are affected by the requirements change.

Rating: 1--2--3--4--5--6--7

Comment:

3.3c: The product shall show all requirement statements which are affected by the requirements change according to links between the requirement statements.

Rating: 1--2--3--4--5--6--7

Comment:

3.3d: The product shall show all requirement statements which are affected by the requirements change according to the requirement statement types.

Rating: 1--2--3--4--5--6--7

Comment:

3.3e: The product shall show all requirement statements which are affected by the requirements change according to having the same owner.

Rating: 1--2--3--4--5--6--7

Comment:

3.3f: The product shall show all requirement statements which are affected by the requirements change according to shared keywords.

Rating: 1--2--3--4--5--6--7

Comment:

3.3g: The product shall provide the user with a function to define the range of change notification according to requirements type, link and the number of requirement statements which must be included in the notification procedure.

Rating: 1--2--3--4--5--6--7

Comment:

3.3h: The product shall provide functions to undertake sensitivity analyses as a result of changes to requirement statements.

Rating: 1--2--3--4--5--6--7

Comment:

3.3i: The product shall allow the user to reconfigure the products to improve the fit between product's functions and user's requirements.

Rating: 1--2--3--4--5--6--7

Comment:

T34: The product data base shall support links between any two requirement statements in the data base, regardless of their location in the data base.

Instructions

Use the prototype data base to show all forms of links between requirement statements. Use queries, schema and graphical representations of the data base, and trace functions to show all forms of link which are possible. If necessary generate new links between requirement statements.

Checks

3.4a: The product data base shall support links between any two requirement statements in the data base, regardless of their location in the data base.

Rating: 1--2--3--4--5--6--7

Comment:

3.4b: The product shall enable the definition of links between requirement statements using static links between the statements.

Rating: 1--2--3--4--5--6--7

Comment:

3.4c: The product shall enable the definition of links between requirement statements using the types of these statements.

Rating: 1--2--3--4--5--6--7

Comment:

3.4d: The product shall enable the definition of links between requirement statements using keywords in statements.

Rating: 1--2--3--4--5--6--7

Comment:

3.4e: The product shall allow the user to reconfigure the products to improve the fit between product's functions and user's requirements.

Rating: 1--2--3--4--5--6--7

Comment:

T35: The product shall produce documents using the contents of its data base. These documents are produced using the commercial products such as word processors, spreadsheets, system design software tools, CAM-CAD tools and procurement management software tools.

Instructions

Produce short documents using the contents of the prototype data base. These documents should demonstrate all output document types and formats which are possible using the product. In particular focus on word processor, spreadsheet, data base and computer-aided design documents.

Checks

3.5a: Requirement statements can be output to word processor documents.

Rating: 1--2--3--4--5--6--7

Comment:

3.5b: Requirement statements can be output to spreadsheet documents.

Rating: 1--2--3--4--5--6--7

Comment:

3.5c: Requirement statements can be output to data bases.

Rating: 1--2--3--4--5--6--7

Comment:

3.5d: Requirement statements can be output to computer-aided design documents.

Rating: 1--2--3--4--5--6--7

Comment:

3.5e: The product shall allow the user to reconfigure the products to improve the fit between product's functions and user's requirements.

Rating: 1--2--3--4--5--6--7

Comment:

T36: The product data base supports the storage and reuse of generic requirement statements. It shall also include a data dictionary to reconcile differences in terminologies in requirement statements.

Instructions

Demonstrate reuse of requirement statements from the prototype data base to assist requirement definition. Demonstrate all useful functions to aid requirement statement reuse.

Checks

3.6a: The product shall support the retrieval of generic requirement statements from the data base.

Rating: 1--2--3--4--5--6--7

Comment:

3.6b: The product shall support the user to understand generic requirement statements in the data base.

Rating: 1--2--3--4--5--6--7

Comment:

3.6c: The product shall support the user to adapt generic requirement statements retrieved from the data base.

Rating: 1--2--3--4--5--6--7

Comment:

3.6d: The product shall allow the user to reconfigure the products to improve the fit between product's functions and user's requirements.

Rating: 1--2--3--4--5--6--7

Appendix 3b: An example of product scores from supplier information used in case study that is described in section 3.2

PRODUCT NAME:							
TASK	TASK DESCRIPTION	YES	NO	SCORE	E	D	O
1 Req. Capture	1.1 Automatic extraction of requirements	1		6	6		
	1.2 Automatic extraction of requirements from existin	1		5	5		
	1.3 Guidelines to capture requirements from stakehol	1		5			5
	1.4 Templates to enter requirements and their attribut	1		7		7	
Sub-Total		4	0	23	11	7	5
2 Req. Modelling	2.1 Can all requirements have attributes	1		7	7		
	2.2 Can req be linked to other statements	1		6	6		
	2.3 All req have attribute identifiers	1		6	6		
	2.4 Attribute enable inclusion of justification	1		7		7	
	2.5 Contents of the database can be checked for incor	1		6		6	
	2.6 Contents of the database can be checked for incor	1		6		6	
	2.7 Contents of the database can be checked for confl	1		4	4		
	2.8 Database can be partitioned to store different syste	1		5	5		
	2.9 Search database to retrieve on keywords	1		6	6		
	2.10 Search database to retrieve on req attributes	1		7	7		
	2.11 Enable user to formulate complex queries	1		7		7	
	2.12 Enables linking of detailed information about ac	1		7		7	
	2.13 Enables storage of non req information	1		6			6
	2.14 Store information in formats other than text		1				
Sub-Total		13	1	80	41	33	6
3 Req Manager	3.1 Configuration management & Version Control	1		6	6		
	3.2 Config. management and version control for each	1		6	6		
	3.3 Attribute to record justification for previous chang	1		7	7		
	3.4 Restrict access to requirements according user's st	1		6	6		
	3.5 Restrictions to who can change requirements	1		6	6		
	3.6 Maintain change history to record changes to dbas	1		6	6		
	3.7 Maintain change history to record who changed d	1		7	7		
	3.8 Supports linkis between any two req regardless of	1		7	7		
	3.9 Enables each link between two req to have a type	1		3		3	
	3.10 Can undertake large scale cutting -and-pasting of	1		6		6	
	3.11 Each requirement can be linked to an external so	1		7		7	
	3.12 If req changes, informs user of all other req linke	1		7	7		
	3.13 User can define configuration rules for complex	1		6			6
	3.14 Supports storage and reuse of generic requireme	1		4		4	
	3.15 Includes data dictionary		1				
	3.16 Can produce documents using its database conte	1		5	5		
	3.17 Enables user to print all or selected parts of the d	1		6		6	
Sub-Total		16	1	95	63	26	6
4 Proc Manager	4.1 Support evaluation of tenders	1		5	5		
	4.2 Can separate user selected requirements	1		7	7		
	4.3 Support preparation of contract based on requirements		1				
	4.5 Support system acceptance against requirements		1				
Sub-Total		2	2	12	12	0	0
FINAL TOTALS		35	4	210	127	66	17

**Appendix 3c: An Example of an AHP Method applied in the case study
described in section 3.2**

		Level 1 Priority Vector						
Method 1								
		Req Cap	Req Mode	Req Manc	Proc Man	Technical	Total Scores	Priority
	Req Capt	1	3	6	2	5	17	0.33
	Req Mode	0.333	1	3	4	6	14.333	0.278
	Req Manc	0.167	0.333	1	5	6	12.5	0.242
	Proc Man	0.5	0.25	0.2	1	4	5.95	0.115
	Technical	0.2	0.167	0.167	0.25	1	1.784	0.035
							51.567	1
Method 3		2.2	4.75	10.367	12.25	22		
	Req Capt	0.455	0.632	0.579	0.163	0.227	2.056	0.411
	Req Mode	0.151	0.211	0.289	0.327	0.273	1.251	0.25
	Req Manc	0.076	0.07	0.096	0.408	0.273	0.923	0.185
	Proc Man	0.227	0.053	0.019	0.082	0.182	0.563	0.113
	Technical	0.091	0.035	0.016	0.02	0.045	0.207	0.041
								1

Appendix 3d: Template 1 – Paper Evaluation (version 1.0)

The template defines the type of product information, type of requirements to acquire, acquisition techniques and tools to use and the best decision-making technique to use.

1: THE MAIN PURPOSE OF THIS TEMPLATE:

- *To provide guidance when acquiring the essential customer requirements and product information necessary to select and reject products as a result of information provided by suppliers. The information provided by vendors is collected and compared against customer requirements. The most critical high level requirements are used for product-requirements compliance checking.*
- *To provide technique guidance for gathering customer requirements and product information*
- *To initially screen many products and to shortlist one or more product(s) for detailed evaluation.*
- *Use this template during the early stages of customer requirements acquisition and product evaluation and selection.*
- *The template has two levels. Level 1 provides the process, guidelines and instructions to the requirements engineer or the evaluation team for using the template; Level 2 provides guidelines and techniques and ways for gathering customer requirements, product information, type of information and any other data necessary for an effective evaluation and selection.*

2: PRELIMINARY GUIDELINES:

- Assemble a core evaluation team that possesses all the necessary skills to carry out the evaluation tasks. The core evaluation team should not change if necessary for the entire duration of the project and should have a customer representative present during the evaluations.
- Assign specific tasks to each team member to avoid confusions and duplications of tasks.
- Weight the assessors on the basis of their skills - since some of the assessors may be more competent at the proposed solution than others and each of the assessors will be asked to give weighting to the credibility of the proposed solution, unless you weight them on the basis of their skills, the results won't be necessarily correct. A lessor competent assessor may give a very high score mark yet an informed one might give a very low score mark and you end up with an average mark whereas it should be low. More information on this can be found on: <http://www.sei.cmu.edu/products/publications/p-cmm.html>
- Have experienced and competent facilitator lead the evaluation team. Preferably the team leader should be familiar with the application domain.

- The team should have access to the main stakeholder(s) who is the key decision-maker. It is also advisable to assign specific tasks to team members.
- The evaluation should assess product's functional sufficiency, ease of integration and use. Primary focus should be to determine whether or not the product does the job needed.
- The evaluation criteria should reflect customer requirements, external interface requirements, processing performance requirements and the underlying system architecture.

3: PROCESS FOR APPLYING THE *PORE* TEMPLATES.

The PORE templates are applied iteratively in cycles of Acquire customer requirements and product information, Analyse information, Decide & Reject products.

Each iteration reduces the number of candidate products and different iterations may vary the set of features being assessed, the individuals making the assessment, techniques or the evaluation criteria to be used. The main process steps are:

- Acquire customer requirements
- Identify and acquire information about candidate products
- Devise an assessment criteria, i.e. what features to be assessed and what judgement scales to be used
- Score each feature for compliance with each customer requirement
- Analyse the scores for product – requirements compliance
- Make a decision or present results to decision-makers

Do the following before product evaluation

- Acquire customer requirements
- Undertake market survey to identify candidate products in parallel with requirements identification/gathering
- Acquire product information

4: Acquire core essential discriminating customer requirements and identify candidate products and suppliers:

- *Core requirements are those requirements that are central and most important to the customer and do not change for the entire duration of the system.*
- *Essential requirements are those requirements that are necessary for the system to achieve its purpose.*
- *Discriminating requirements are those requirements that express differences between products.*

4.1: Elicit core functional and non-functional customer requirements

Do the following before requirements elicitation:

- Identify key stakeholders – the key people whose opinion must be taken into account and who have the priority in the event of conflicts of requirements between stakeholders
- Identify an user groups which are likely to have different requirements
- Define what exactly you need the product to be able to do
- Define what the business need NOT what does it want.
- Determine how many essential core requirements to elicit
- Avoid requirements which will bias against or towards specific products or suppliers

Do the following during requirements elicitation

- Elicit core essential non-functional requirements
- Elicit core essential functional requirements

Do the following after requirements elicitation

- Describe and structure acquired requirements using techniques such as Volere Requirements Specification templates found in: <http://www.atlsysguild.com/Site/Robs/Template.html>
- Prepare a way of comparing products and product features based on essential core customer requirements

Use the following techniques to elicit and acquire customer requirements:

- Techniques and guidelines provided in the ACRE Framework:
 - **Brainstorming** - asks stake-holders to generate as many requirements as possible, with emphasis on generation rather than on evaluation. Observe the following brainstorming basic rules:
 - No criticism should be allowed
 - Allow free wheeling
 - Quantity is wanted and should be encouraged
 - Combination and improvement should always be sought

For information on brainstorming tools, see:
http://www.expertchoice.com/software/teamec/teamec_brochure.htm

- **Interviews** – conduct both unstructured and structured interviews:
 - *Unstructured interviews* - asks stake-holders about the topic in question without a prepared list of questions
 - *Structured interviews* - asks stake-holders a list of prepared questions about they want the chosen product(s) to able to do.
- **Scenario Analysis** - ask stakeholders to describe perceived sequences of actions and events for specific generic tasks which the product is intended to accomplish.
- **Card Sorting** - ask stake-holder prioritise and group requirements by sorting into groups a set of cards, each of which has the name essential requirements written or depicted on it; ask the stakeholders to says what the criterion was for sorting, and what the groups were.

For more techniques and guidelines for using these techniques, see ACRE site:
<http://www.soi.city.ac.uk/~cc559/acre/welcome.html>

- **Architecture Analysis** - examine and analyse existing systems structure/architecture. Procured products have to be integrated into the existing customer systems architecture and legacy systems. Examine the existing system architecture, hardware, software and other systems to discover any constraints. For more information on this see: http://www.sei.cmu.edu/ata/ata_init.html
- **Document analysis** – examine organisation documents to discover existing processes, information flows and data structures.

4.2 Identify Candidate Products and Suppliers

Identify candidate products and suppliers by conducting a market survey using any or all of the techniques listed below. If product(s) has already been identified and the supplier is known, please go to STEP 2:

Do the following to identify candidate products before acquiring product information:

- Browse the internet and send a general request for information to known suppliers, news groups, special interests groups, mailing lists and bulletin boards. A sample request for information call is as below:

Dear Product Supplier

We are looking for COTS products to build a very large software intensive system. Our role is to recommend one or more such products in accordance with customer needs.

We are therefore asking for all those who wish their products to be considered to send us all information which they consider relevant to the assessment of their product.

A short list of all possible products will be compiled and a second, more detailed assessment will be carried out.

For the second, more detailed assessment, product demonstrations at our site or your will be considered.

The deadline for consideration is: Day, Date, Month, Year.

All enquiries and information should be directed to:

Main Contact Person

Postal Address:

Telephone Number:

Fax Number:

E-mail Address:

Thank you very much for your consideration. We are looking forward to working with you in the near future.

Name of contact person:

- Issue an open or closed Invitation To Tender (ITT) or advertise in publications such as the Contract Bulletin.
- Survey publicity literature, e.g. trade journals - most vendors publish information about their products in specific trade journals.
- Study published evaluations in the technical literature.
- Request marketing literature/brochure direct from known suppliers – most organisations have a marketing department that produces literature describing their products. These can be obtained direct from the organisation.
- Contact organisations in other application domains who are currently using similar technology/products – some organisations in other application domains might have used similar products and therefore have gained useful experiences with the product. It's always beneficial to look at these organisations for more information.
- Direct vendor solicitation – if the product has already been identified and the supplier is known, contact the supplier directly.

- Visit trade shows, exhibitions or organised demonstrations – trade shows and exhibitions are another sources of product information. Trade shows and exhibits have an added advantage that you will be able to closely view and compare competing products and demonstrations at the same time

5: Acquire basic product and supplier information:

Do the following after identifying candidate products:

- Develop a questionnaire for eliciting basic product information.
- Prepare a covering letter to accompany the questionnaire
- Send the questionnaire with the accompanying covering letter, by e-mail, fax, or post. The covering letter should state, among other things, the following information:
 - The proposed closing date and time for accepting questionnaire responses.
 - The purpose of the questionnaire, (i.e. for acquiring basic information).
 - A brief description of the proposed system, (i.e. the system will have 200 users).
 - Copyright and legal issues (i.e. if supplier does not want to be publicly identified),
 - The person to contact if more information is needed,
 - Estimated project budget to be spent on procuring the products (i.e. how many product licenses will be purchased).
 - The proposed date when the suppliers will be informed of the initial decision.

A sample cover letter and a sample questionnaire for acquiring the basic information are shown below. Both the questionnaire and the covering later can be adapted or tailored to meet specific purposes or specific applications.

5.1: THE SAMPLE COVERING LETTER:

Dear Supplier

We are delighted to inform you that you have been selected to be part of our product evaluation and selection. As you may recall we are part of a team which is helping a large customer to select new commercial-off-the-shelf products for developing a large complex software intensive system. The purpose of this questionnaire is to gather information from product suppliers to select candidate products that meet our customer's requirements. Suppliers of successful products will be invited to participate in a second, more detailed evaluation in the near future.

The questionnaire is a key part of our evaluation and product analysis and we therefore request you to complete ALL questions as fully and truthfully as possible. Questionnaires with incomplete answers will not be considered. Deadline for the return of the questionnaire is [time, day, date, month, year]. Questionnaires received after this deadline will not be considered. We aim to inform you of our decision on [day, date, month, year]. All questionnaires must be returned to:

Name of main Contact Person

Address:

Telephone Number

Fax Number

E-mail Address

Successful suppliers will be invited to participate in a more detailed evaluation buy demonstrating their product at, [location and when]. Our purpose is to recommend one or a suite of products, possibly from different suppliers that meet all or most of the customer's requirements. The customer will purchase a large number of products. The system will have over xxx end-users, so a contract resulting from these studies will be very large.

If you have any questions about the process or, the questionnaire, please do not hesitate to contact [main contact person] at the above address or e-mail.

Finally, if you do wish your identity, or the identity of the supplier to be made public, please tick this box [].

We thank you for taking the time to complete the questionnaire.

Yours Sincerely

Team Leader or Contact Person.

5.2: THE SAMPLE QUESTIONNAIRE:

The questionnaire should ask each product supplier how the product complies with essential functional and non-functional customer requirements. The questionnaire should focus among other things, on gathering the following information about each product:

For more information on questionnaire tools, see:
http://www.expertchoice.com/software/teamec/teamec_brochure.htm

5.2.1: Basic Product Information

This section asks you to describe attributes of your product. Please provide the following information as accurately as possible.

(1) Please supply the following basic product and supplier information:

Product Name:

Supplier Name and Address:

Supplier Contact Representative:

E-mail Address:

Telephone Number:

Fax Number:

Product's Technical Features, Hardware and Software Requirements

This section gives you the chance to describe the technical features of your product:

(2) Please give an accurate technical description of your product:

(3) Please indicate hardware requirements for your product: i.e.

- Processor
- Minimum Memory (RAM) required
- Minimum disk space (HARD) required
- Mouse supported
- Keyboard supported
- Monitor supported

(4) Please indicate which platform(s) does the product run on:

- All platforms
- PC platform
- Workstation
- Client/Server
- Protocols and Network protocols supported

(5) Please indicate software requirements for your product, i.e.:

- Operating system required
- Database(s) supported
- Any other software required

(6) Please indicate which environment(s) does the product support

- Single user
- Multiple User
- Enterprise-wide
- Distributed

(7) Please indicate the current version of your product and all available versions

5.2.2: Product Coverage

This section asks you to indicate the degree to which the product provides supports for the major and mandatory customer tasks such as functional and non-functional requirements. For each task, where applicable, please indicate the degree on a scale of 1 to 7, where 1 = minimum, 4 = average and 7 = maximum. You can provide comments you deem necessary:

1: Functional Requirements Coverage

(1.1) From the viewpoint of the customer application domain, will the product work as is or will it need some modifications?

(1.2) What other supporting packages does your product use or depend on (e.g. DBMS)?

(1.3) Does the product allow for additions of new functionality in the future?

(1.4) Is the source code available for purchase? If so what standard does it follow or comply with, e.g. ANSI, Open Architecture, X-Open, and ISO?

2: Non-functional Requirements Coverage

(2.1) Please specify which platform(s) and operating system(s) is your product compatible with?

(2.2) What hardware/communications set up does it require?

(2.3) What is the style of the user interface, e.g. GUI, X-Windows or text based?

(2.4) From the viewpoint of all target users what is the typical learning curve for learning to use the product?

(2.5) What is the level of integration required with other software/systems used in the organisation?

(2.6) What will be the envisaged risks, in terms of the organisation's dependence on the product and what will be the costs involved?

(2.7) Is the product flexible enough to allow for future technology updates and insertions?

5.2.3: Technical Support Arrangements

This section gives you the chance to describe how the product will be supported if purchased. It also asks you to indicate the licensing arrangements and the type of technical support available.

(1) What are available licensing arrangements and cost per license?

- The relative cost of the product can depend on:
 - its intended use within the system (e.g. number of copies)
 - cost of configuration - this will vary with the maturity of the product and whether it is in the heart of the system architecture or on its periphery
 - 'hidden' costs such as annual support, runtime licenses, end-user documentation and upgrade costs

(2) Are there any costs for technical support, training, and maintenance?

- (3) Is source code available for purchase and what are the arrangements and costs?
- (4) Is there any extra support provided for high-risk and critical systems?
- (5) What is your organisation policy on upgrades and fixes?
- (6) Is user and system documentation provided and what are the costs?
- (7) How long will your organization continue supporting this product?
- (8) What kind of help is available to learn about the product and to solve problems?
- (9) Are there any additional costs such as annual support, runtime licenses, end-user documentation and upgrade costs (Yes/No). If there are what are the arrangements?
- (10) Is training provided and if it is, how much does it cost?
- (11) Are demo copies available and if there are what are licensing arrangements?

5.2.4: Contractual Conditions

This section asks you to indicate your organisations contractual arrangements and conditions.

- (1) What is the policy of your organisation's contract terms and procurement conditions, e.g. fixed price, cost-plus, flexible terms or other?
- (2) What are conditions and criteria for accepting the contract?
- (4.3) What are the conditions for extra technical support?
- (4) Are there any extra legal issues?
 - (4.5) What are the pricing mechanism, paying method and conditions?
- (6) What are the arrangements and conditions for contract termination?
- (7) What are your organisation's policy on software upgrades and provisions for software fixes within the project schedule?

For more guidelines on contractual issues, please see:
<http://www.itworld.co.uk/buyit/guide7.html>

5.2.5: Supplier and Product History

This section asks you to provide accurate and detailed information about your organisation and the history of your product:

- (1) How long has the organisation been in business?
- (2) How long has the product been available?
- (3) What is your average annual turnover and your customer base?
- (4) How many copies of your product have been sold to date?
- (5) What is the current version of the product?
- (6) How many employees does your organisation employ?
- (7) What are the skills and experience levels of the key personnel?
- (8) Can you supply at least two (2) references where the product has been or is being currently used; (Note: referees might be approached).
- (9) How is your organisation's track record, e.g. record of successful and unsuccessful projects you have been involved?
- (10) What is the CMM level of your organisation? – CMM (Capability Maturity Model) is a model for judging the maturity of the software processes of an organization and for identifying the key practices that are required to increase the maturity of these processes. More information about CMM can be obtained from: <http://www.sei.cmu.edu/cmm/cmm.html>
- (11) What international development and management standards do your organisation follow and comply with?
- (12) Does the product has any limitations; e.g. maximum size of database, maximum number of windows open simultaneously, or maximum number of users at a time?
- (13) Does the vendor have a good track record for: on time deliveries; good, timely technical support and quality products?
- (14) What is the breadth of the vendor's customer base?

For more supplier selection guidelines, please see the following sites:
<http://www.itworld.co.uk/buyit/index.html> and
<http://www.itworld.co.uk/buyit/guide6.html>, (for selecting suppliers) and
<http://www.itworld.co.uk/buyit/guide5.html> (for managing supplier relationships)

6: Analyse Acquired Customer Requirements and Product Information:

Do the following during product evaluation sessions:

Use the following heuristics as advice and guidelines for decision making:

- Avoid products that present the best value for money at the time but whose upgrade can prove to be costly as time and technology advances
- Don't buy version 1.0 of any product if it can be avoided
- If there is a choice don't buy a product for which an evaluation copy is not available
- Always obtain documentation with the evaluation copy
- Purchase extra vendor technical support for high-risk products.
- Focus on the overall life-cycle costs rather than solely on the initial acquisition costs
- Look for solution that fit with the general architecture of the company's hardware and software
- Arrange to keep source code in escrow for products where there is a significant risk that the vendor might go out of business.
- Beware of the vendor dependence
- Use compliance with international standards as an evaluation criteria

Analyse and evaluate the information obtained from the questionnaire responses and high-level customer requirements. Identify user requirements for particular tasks and then map those requirements to features that a product aimed at supporting that task should possess. Before beginning the analysis and evaluation, do the following:

- Group questionnaire responses into vendors who are:
 - Prepared to demonstrate their products
 - Those who provided evaluation copies
 - Those who provided information packages
 - Those who did not respond to the questionnaire
- Allocate responsibilities to each team member to carry during the evaluation
- Decide the required features each product must possess in order to be selected.
- Prioritise the required features with respect to customer requirements
- Decide the level of confidence required for each feature and then select the level of rigour required for the evaluating the features.
- Agree on a scoring/ranking system that will be applied to all the features.
- Create a product and supplier information base or simple spreadsheet and record the following key information about each product:
 - Vendor name and address
 - Cost of the product
 - Availability of the product
 - Track record of the supplier
 - Amount of in-house experience required
 - Sources of information
 - Reason for selecting the product
 - Reasons for rejecting the product
 - Likely risks associated with purchasing the product
- Divide product features into two types- (this simplifies and speeds-up feature comparisons):

- Simple features that are either present or not present. These are assessed by simple Yes/No nominal scale;
- Compound features where the degree of support offered by the product must be measured or judged on an ordinal scale with the following scale points:
 - M Mandatory (10)
 - HD Highly Desirable (6)
 - D Desirable (3)
 - N Nice to have (1)
- Carry out the analysis and evaluation to determine how well the products being evaluated meet the evaluation criteria and customer requirements
 - First use simple high-level mandatory customer requirements (Yes/No type) to check product compliant. Example of a high-level mandatory customer requirement is “ The product shall be compatible with Access database”. Any product that is not compatible with Access database is automatically eliminated at this stage. Continue using simple high level requirements to eliminate non-compliant products and iteratively reducing the number of candidate product.
 - For the remaining products, score the compound non-simple features using the agreed measurement scale and scale points; (e.g. if a mandatory feature is fully provided, give score 10 and if not give score 0 and etc.)
 - Compare products feature by feature, assess how well each product possesses the required features and how well each product meets all mandatory customer requirements.
 - Devise a scale of 1 to 7, (e.g. [1-2-3-4-5-6-7]) for assessing the degree of support a product provides for specific feature/requirement, where 1=minimal support, 4=average support and 7=total support. Assume that products that possess a feature and score highly for that feature are “good” and those that do not score high are “less good”.
 - Make more comparisons using mandatory and/or desirable properties, qualities, attributes or characteristics of each product, (ref. Feature Analysis).
- Set minimum compliance threshold according to essential and non-essential requirements. The threshold could be set as:
 - Either minimum compliance threshold of each product on a scale of [1-2-3-4-5-6-7], e.g. all product scoring above 5 will be considered compliant in this initial stage.
 - Maximum number of products compliant with mandatory and highly desirable features

- Assess all candidate products for basic acceptability by deciding that a product will be acceptable if:
 - All simple mandatory requirements are met;
 - All compound mandatory requirements meet their required level of acceptable threshold
- Develop reusable spreadsheets for ensuring speedy and justifiable decision making process. An example spreadsheet is shown below:

	PRODUCT NAME:			
Supplier Name:				
Supplier Address:				
Product's Cost:				
Availability of the product:				
Amount of in-house experience:				
Track record of the supplier:				
Sources of information:				
Reasons for selecting product:				
Reasons for rejecting product:				
Risks associated with purchasing the product:				
MAIN CUSTOMER TASK	MAIN FEATURES TO PERFORM TASK	YES	NO	SCORE
Task-1	Feature-1.1	1		7
	Feature-1.2	1		5
	Feature-1.3	1		6
	Feature-1.4	1		7
Sub-Total		4	0	25
Task -2	Feature-2.1	1		7
	Feature-2.2	1		7
	Feature-2.3	1		7

- Analyse and interpret the results using decision-making techniques such as AHP. For information about AHP see <http://www.expertchoice.com/>

7: Decide and Reject Non-Compliant Products

Do the following after analysing acquired product information:

- Use value judgement scales to measure how much each product provides support for customer requirements and what degree of that support is present. Value judgement scales are measurement scales devised for assessing the desirability of an alternative product with respect to individual customer requirements, (ref. DESMET Report on Feature Analysis, ISSN: 1353-7776).
- Also use more direct means of comparison such as comparing the scores obtained for each key feature across candidate products to increase the accuracy and reliability of the comparison results

- Once all features for each product have been “scored”, aggregate the individual scores to provide an overall score for each product.
- Collate and compare the various scores to decide the relative order of merit and ranking for each product using techniques such as weighted score average

CAUTION: *note that combining scores of multiple features (in whatever way) must be treated with caution, because many different combinations of numbers can produce the same aggregate score*

- If necessary use Card Sorting technique (see above) and customer requirements to discriminate between candidate products.
- Reject products which are non-compliant with customer requirements
- Respond to the questionnaire by sending rejection letters to rejected products and invitation letters to successful products inviting them for participation in a more detailed evaluation for the next phase. In both cases use a standard reusable letter.
 - For rejected products, inform the supplier that the evaluation results can be individually discussed on request.
 - Provide an explanation why a decision was made and why the product was rejected
 - For successful candidates:
 - Send an invitation letter offering possible dates for evaluation.
 - State the format and process of the product evaluation to be performed
 - Send any relevant material or information to be used during the product evaluation, e.g. a sample of test cases
- Always record the rationale for accepting or rejecting the product

CAUTION: beware of some dangerous vendor comebacks. Always have strategies for handling these vendor comebacks.

COMMENT: sometimes it might be necessary to have a second iteration, to return to the supplier for clarification and further acquisition/elicitation, but just within one Decide & Reject process. The key issue in these circumstances is to give all vendors the same opportunities and questions. Keep an open communication channel to ensure rapid required responses.

Use information gained from product evaluation to inform requirements acquisition in the next phase, the hands-on product demonstration evaluation.

NEXT STEP: Go To Template 2: Hands-on Product Demonstration Evaluation:

Appendix 3e Template 2: Hands-on Evaluation (version 1.0)

Purpose: What information is needed at each stage of the evaluation process:

- *To provide guidance when acquiring customer requirements and product information necessary to select and reject products from supplier led demonstrations using test cases for individual requirements; selected vendors are brought in-house for demonstrations;*
- *To evaluate in more detail the alternative products shortlisted using T1 and to recommend one or more product(s) for pilot project evaluation;*
- *Use this template in the second stage of the evaluation process during vendor demonstrations to evaluate in detail selected products*

Process for applying Template-2:

- *During demonstrations the evaluation team will be looking for technical and architectural compliance, support capabilities and functionality delivered to meet the requirements. Develop a prototype to aid in test case generation and always have a stakeholder representative present during the demonstrations. Always insist in being in charge of the demonstration session other than the vendors being in charge. Also arrange for people with specialist knowledge to be available for consultations if need be.*

TO DO BEFORE SUPPLIER DEMONSTRATION SESSION

Step 1: The evaluation team and together with stakeholder(s) design and develop criteria and acceptance test cases. The team should do the following before the demonstrations:

(1) Have the stakeholders or the main stakeholder assign priority weights to all requirements, (the weights will indicate which product features are mandatory or optional) and groups of requirements.

(2) Together with the stakeholders, develop a working prototype of the required system. The prototype should be a realistic representation of the required system, in size and complexity.

(3) Using the prototype and stakeholder representatives, design acceptance test cases. The test cases should cover all major product properties (i.e., functionality, behavior, architecture and usability) and all the tasks the product will be expected to perform.

(3.1) Divide acceptance tests into major tasks, (e.g. functionality, behavior, architecture, usability)

(3.2) For each major task, further divide it into all the sub-tasks which are necessary to meet the parent task.

(3.3) For each of the sub-tasks design a series of test cases to check compliance. Also provide instructions on how the task will be checked.

(3.4) For each test case in 3.3, assign quantitative scores of 0-7 which will indicate the degree of compliance or the presence of a feature. An example of the test cases is given below which is taken from a recent real life study:

Acceptance Test 1: Requirements Capture

This first acceptance test explores how well the supplier's product meets requirements related to requirements capture. There are 4 tasks which should be followed in sequence. If the Vision-94 data base has not been loaded in task T1.1 start from task T1.2. However, the reviewers should ask reasons why the data base was not loaded, and which data bases can be loaded into the product.

Task-1 (T1)

T1.1: The product shall aid automatic extraction of requirement statements from existing commercial relational data bases which contain requirement statements.

Instructions

Download the provided Vision-94 data base into the product. This should have been done prior to the demonstration session. Demonstrate the existence of the Vision-94 data base in the product using simple queries on the product data base. For example, Vision-94.

Checks

Use the following checks to rate the product's fit to diverse requirements, where 1=very poor fit and 7=excellent fit. In essence each check is a more detailed requirement statement which the product should meet.

1.1a: The data base can be loaded into the product.

Rating: 1--2--3--4--5--6--7

Comment:

1.1b: All data base tables have been loaded.

Rating: 1--2--3--4--5--6--7

Comment:

1.1c: All data base relationships have been loaded.

Rating: 1--2--3--4--5--6--7

Comment:

1.1d: All data in the data base tables appears to be correct.

Rating: 1--2--3--4--5--6--7

Comment:

1.1e: There is no obvious distortion of the data base contents.

Rating: 1--2--3--4--5--6--7

Comment:

1.1f: The product shall allow the user to reconfigure the products to improve the fit between the product's functions and user's requirements.

Rating: 1--2--3--4--5--6--7

Comment:

(4) Run test cases on the prototype to test their validity and refine where possible.

(5) Send a copy of the prototype to the candidate vendors so as to be familiar with the test cases before the demonstrations.

TO DO DURING EACH SUPPLIER DEMONSTRATION SEESION

Step 2: Conduct live vendor demonstration sessions. A stakeholder representative who is an application domain expert, who is familiar with the target system and who has a stake in the system should be always present in all demonstration sessions. The stakeholder representative should also be familiar with the organisation's strategic plans. However, the stakeholder representative should not have a direct influence in the process. S/he should be there purely to help clarify or provide detailed domain knowledge and information. Also, the evaluation should have access to people with specialist knowledge like architecture designers, usability engineers, etc.

(1) Prior to starting the demonstration session, give each member of the evaluation team, a blank copy of the test cases to record their scores

(2) Using the test cases generated in STEP 1 as a guide, ask questions about the product that the vendor will answer by demonstrating that their products.

(3) Record on the test cases the presence or otherwise absence of a feature or the degree of requirement-property compliance. Also record your rational or decision for awarding the score.

(4) As well as evaluating the main properties of the product, use usability heuristics, such as Nelson's to evaluate the usability and the user interface.

(5) Video tape the demonstration sessions. The video will be used during the decision process when some clarification is needed. Also the video can be linked to other techniques such as Design Rationale to help reach an informed decision.

(6) If possible, have an independent scribe to record decision rationale during the demonstrations and any other peripheral information that might be useful but otherwise could be missed by the members of the evaluation team.

TO DO AFTER EACH SUPPLIER DEMONSTRATION SESSION

Step 3: (After the demonstration sessions): Rank products and make a recommendation to the customer. Also inform the vendors who participated in the demonstration about the decision and if necessary discuss with individual vendors the results of their product's evaluation. After each demonstration session and after the demonstration phase, the following should be done:

(1) Immediately after each demonstration, the evaluation team should collate their individual anonymous scores into a single agreed test scores for each product. It is important that the agreed scores should be arrived at through consensus and therefore steps must be taken to guard against a dominance by one member of the team so that the final scores reflect the judgements of the whole team not just one member. If necessary use the scribes and video recording to aid the judgements decisions.

(2) To minimise possible bias take into account the relative experiences of the evaluation team when collating judgement scores. (This can be achieved by evaluating the team members on their relative experience and skills. Bias is usually caused by the assumption that all the members have equal experiences and expertise which is seldom the case)

(3) When a single agreed test scores for a product has been agreed, use decision making tools like the AHP to produce an overall relative ranking score of the product.

(4) If necessary, use the product information gained during the demonstration to acquire more detailed customer requirements. Use techniques such as card sorting or laddering to discover further discriminating customer requirements.

(5) If no further requirements acquisition is necessary, produce a relative ranking of the products and make a recommendation to the client about which product(s) meets their requirements.

(6) Put any useful information about the product into the product database. The information should include relative strengths and weaknesses of the product, the decision rationale for either recommending or rejecting the product, etc.

(7) Inform the vendors about the outcome of the decision and where necessary or required, discuss the results in confidence with the individual vendors without disclosing any information about other vendor products

Step 4: Go to Template-3: User Trial Template

Appendix 3f User Trial Template (version 1.0)

1. Over a limited period, install the selected products in the user environment
2. Design test cases to test the following: interoperability, integrability, usability, performance, reliability, learning curve and training.
3. Work with main stakeholders to weight each category
4. Design a score sheet for allocating compliance scores
5. Assemble an evaluation team composed of stakeholder representatives that will allocate scores during the duration of the pilot project. The team must have all the required technical skills as well as the application domain knowledge
6. If possible negotiate to have a supplier representative on site during the duration of the pilot project to help with technical problems or have a dedicated contact person from the supplier

7. Each evaluation team member allocates scores on the interoperability, integrability, usability, performance, reliability and the learning curve of each product. For usability Nelson's Usability Heuristics can be used
8. Record all decisions behind all scores
9. Record all the problems experienced during this period including the quality of the supplier's response to technical queries, help desk and technical support
10. Identify and acquire new requirements and required product features

11. Collate all scores for each product into one final score
12. Rank each product and select the preferred one
13. Negotiate with the supplier to include the new features that were identified during the pilot project
14. Negotiate contractual and legal issues with the supplier including licensing arrangement.

Appendix 4a: Algorithm for processing process chunks:

```
BEGIN
  FOR each_requirements_type SET minimum_sufficient_number_of_requirements = x;
  FOR each_candidate_product SET minimum_sufficient_number_of_features = y;
  CHECK IF acquired requirements => x;
  CHECK IF acquired product features => y;
  IF acquired requirements => x AND acquired product features => y THEN begin analysis;
  IF acquired requirements < x AND acquired product features < y THEN 'not enough
  information'
  Advise is: 'Do more acquisition'
END;

BEGIN ANALYSIS
  Analyse acquired requirements
  Analyse acquired product information

  IF Total_Number_Of_Requirements = 0 THEN requirement_model = empty';
  Advise is: 'Acquire atomic customer requirements';
  RETRIEVE process_chunk = 1.11;

  IF Total_Number_Of_Requirements < x THEN 'Insufficient_customer_requirements';
  Advise is: 'Acquire more atomic customer requirements';
  IF Insufficient 'atomic_functional_requirements' THEN
  RETRIEVE process_chunk = 1.12;
  IF Insufficient 'atomic_non-functional_requirements' THEN
  RETRIEVE process_chunk = 1.14;
  IF Insufficient 'atomic_architecture_requirements' THEN
  RETRIEVE process_chunk = 1.16;
  IF Insufficient 'atomic_user_requirements' THEN
  RETRIEVE process_chunk = 1.18;
END IF;

  FOR EACH CANDIDATE PRODUCT
  IF Total_Number_Of_Features = 0 THEN product_model = empty;
  Advise is: 'Acquire product information'
  RETRIEVE process_chunk = 1.4;

  FOR EACH CANDIDATE PRODUCT
  IF Total_Number_Of_Features < y THEN 'Insufficient_product_information';
  Advise is: 'Acquire more product information';
  RETRIEVE process_chunk = 1.5;

  IF Insufficient 'supplier_information' THEN
  RETRIEVE process_chunk = 1.7;

  IF Insufficient 'contractual_information' THEN
  RETRIEVE process_chunk = 1.9;

  IF Total_Number_Of_Requirements > x AND Total_Number_Of_Features > y THEN
  sufficient_customer_requirements AND sufficient_product_features;
  Advise is: 'determine compliance checking';

END ANALYSIS

BEGIN REQUIREMENT-PRODUCT ANALYSIS
SET requirement-product compliance = FOR each product maximum features mapped to essential
customer requirements;
```

```

IF no_core_requirements mapped_to_any_feature THEN 'no compliance mapping'
Advise: 'Do more detailed analysis'
RETRIEVE process_chunk = 1.20;

IF one_core_requirement NOT mapped_to_any_feature THEN 'no compliance mapping'
Advise: 'Do more requirement-product analysis'
RETRIEVE process_chunk = 1.21;

IF no product-requirement mapping THEN 'no compliance mapping'
Advise is: 'Do more analysis'
RETRIEVE process_chunk = 1.23;

IF all_requirements mapped to all_features THEN 'no discriminating requirements'
Advise is: 'Do more detailed analysis';
RETRIEVE process_chunk = 1.22;

IF all_features mapped_to all_requirements THEN 'no discriminating features'
Advise is: 'Do more detailed analysis'
RETRIEVE process_chunk = 1.25;

END REQUIREMENT-PRODUCT ANALYSIS

BEGIN DETERMINE REQUIREMENT-PRODUCT COMPLIANCE

IF there exist a mapping-relationship between one or more core requirement and one or more product
features THEN ' requirement-product compliance = TRUE'

IF there exist mapping between one or more product features and one or more essential requirements
THEN 'product-requirement compliance = TRUE;

IF no mapping-relationship between one or more essential requirements and one or more product
features THEN requirement-product compliance = FALSE

IF no mapping-relationship between one or more product features and one or more essential
requirements THEN 'product-requirement compliance = FALSE';

END DETERMINE REQUIREMENT-PRODUCT COMPLIANCE

BEGIN REJECTING NON-COMPLIANT PRODUCTS

FOR each candidate product IF requirement-product compliance = FALSE OR product-requirement =
FALSE THEN candidate product = REJECTED;
RETRIEVE process_chunk = 1.28

IF all candidate products = REJECTED THEN 'all products eliminated'
Advise is: 'identify new products or relax requirements and do more analysis'
RETRIEVE process_chunk = 1.29;

END REJECTING NON-COMPLIANT PRODUCTS;

```


Appendix 4b: Steps for processing the chunks

Step-1:

Acquire product information
Acquire supplier requirements
Acquire contractual requirements
Acquire customer requirements
CHECK: IF acquisition completed THEN do step 2

Step-2:

Set SUFFICIENT_NUMBER_OF_REQUIREMENTS = x;
Analyse acquired product information and customer requirements
CHECK:
IF INSUFFICIENT product information or requirements THEN
 Acquire more product information or requirements
IF NON-DISCRIMINATING requirements or product information THEN
 Acquire more product information or requirements
IF SUFFICIENT requirements and product information AND discriminating
requirements or product information THEN do step 3

Step-3:

Determine product-requirement compliance mapping
CHECK:
IF no product-requirement mapping THEN DO more analysis
IF Core requirements not mapped to product feature THEN DO more detailed analysis
IF One core requirement not mapped to any product feature THEN DO more detailed analysis
IF All requirements mapped to all product features THEN DO more detailed analysis
CHECK if compliance mapping completed THEN do step 4

Step-4: Reject one or more products

IF All products rejected or eliminated THEN
EITHER identify new products AND new requirements OR
Relax strictness of customer requirements AND Backtrack to do more detailed analysis
 Check if selected products meet all core essential customer requirements
 IF one or more selected requirements meet core customer requirements THEN
 recommend products to customer and END process
 ELSE perform process-goal-2

Appendix 4c: Processing of goals and process chunks

BEGIN PROCESS

 PROCESS GOAL-1

 Acquire product basic information (CALL CHUCK 1.1)

 Acquire supplier requirements (CALL CHUNK 1.2)

 Acquire contractual requirements (CALL CHUNK 1.3)

 Acquire essential atomic functional requirements (CALL CHUNK 2.1)

 Acquire essential atomic non-functional requirements (CALL CHUNK 2.2)

 Acquire essential atomic architecture requirements (CALL CHUNK 2.3)

 Acquire essential atomic usability requirements (CALL CHUNK 2.4)

 Analyse acquired information and requirements (CALL CHUNK 3)

 Determine product-requirements compliance (CALL CHUNK 4)

 Reject one or more non-compliant products (CALL CHUNK 5)

 END PROCESS GOAL-1

BEGIN CHECK_CHUNK

CHECK: All products eliminated (YES or NO)?

IF YES THEN

 CALL ELIMINATION_CHUNK

ELSE

IF NO THEN

 CHECK IF SELECTED PRODUCTS MEET REQUIREMENTS

 IF SELECTED PRODUCTS MEET REQUIREMENTS THEN

 RECOMMEND TO CUSTOMER

 END PROCESS

 ELSE

 NOT FINAL SELECTION;

 PROCESS GOAL-2

 END IF;

END IF;

END CHECK_CHUNK

BEGIN ELIMINATION_CHUNK

 IF All products are eliminated THEN

 EITHER identify missing products AND missing requirements OR

 Backtrack to do more Analysis,

 Relax strictness of customer requirements

 CALL CHUNK 3

 CALL CHUNK 4

 CALL CHUNK 5

END ELIMINATION_CHUNK.

BEGIN PROCESS_CHUNK_GOAL-2:

 Acquire non-essential functional requirements (CALL CHUNK 2.1)

 OR

 Acquire non-essential non-functional requirements (CALL CHUNK 2.2)

 OR

 Acquire non-essential architecture requirements (CALL CHUNK 2.3)

 OR

 Acquire product information (CALL CHUNK 1.1)

 Analyse acquired requirements (CALL CHUNK 3)

 Determine compliance (CALL CHUNK 4)

 Reject one or more non-compliant products (CALL CHUNK 5)

END PROCESS_CHUNK_GOAL-2

CHECK: All products eliminated (YES or NO)?

IF YES THEN CALL ELIMINATION_CHUNK

IF NO THEN NOT FINAL SELECTION

PROCESS GOAL-3:

Acquire complex non-atomic functional requirements (CALL CHUNK 2.1)

OR

Acquire complex non-atomic non-functional requirements (CALL CHUNK 2.2)

OR

Acquire complex non-atomic architecture requirements (CALL CHUNK 2.3)

OR

Acquire product information (CALL CHUNK 1.1)

Analyse acquire information (CALL CHUNK 3)

Determine compliance (CALL CHUNK 4)

Reject one or more non-compliant products (CALL CHUNK 5)

END PROCESS GOAL-3

CHECK: All products eliminated (YES or NO)?

IF YES THEN CALL ELIMINATION_CHUNK;

IF NO THEN NOT FINAL SELECTION

PROCESS GOAL-4:

Acquire customer user requirements (CALL CHUNK 2.4)

OR

Acquire product information (CALL CHUNK1.1)

Analyse acquired information (CALL CHUNK 3)

Determine compliance (CALL CHUNK 4)

Reject one or more non-compliant products (CALL CHUNK 5)

END PROCESS GOAL-4

CHECK: All products eliminated (YES or NO)?

IF YES THEN CALL ELIMINATION_CHUNK;

IF NO THEN RECOMMEND REMAINING PRODUCTS.

END PROGRAM:

Appendix 4d: A list of PORE situations

- (1) No basic product information – product model is empty
- (2) Insufficient basic product information
- (3) Incomplete basic product information
- (4) Non-discriminating basic product information
- (5) No supplier information
- (6) Insufficient supplier information
- (7) Incomplete supplier information
- (8) Non-discriminating supplier information
- (9) No contractual requirements
- (10) Insufficient contractual requirements
- (11) Incomplete contractual requirements
- (12) Non-discriminating contractual requirements
- (13) Empty requirements model
- (14) Insufficient core atomic functional requirements
- (15) Incomplete core atomic functional requirements
- (16) Non-discriminating core atomic functional requirements
- (17) Insufficient essential atomic non-functional requirements
- (18) Incomplete essential atomic non-functional requirements
- (19) Non-discriminating essential atomic non-functional requirements
- (20) Insufficient essential atomic architecture requirements
- (21) Incomplete essential atomic architecture requirements
- (22) Non-discriminating essential atomic architecture requirements
- (23) Insufficient essential atomic customer user requirements
- (24) Incomplete essential atomic customer user requirements

- (25) Non-discriminating essential atomic user requirements
- (26) Insufficient global core atomic functional requirements
- (27) Incomplete global core atomic functional requirements
- (28) Non-discriminating global core atomic requirements
- (29) Insufficient global essential non-functional requirements
- (30) Incomplete global essential non-functional requirements
- (31) Non-discriminating global essential non-functional requirements
- (32) Insufficient global core architecture requirements
- (33) Incomplete global core architecture requirements
- (34) Insufficient global core user requirements
- (35) Incomplete global core user requirements
- (36) Non-discriminating global core user requirements
- (37) Insufficient global core product capability features
- (38) Incomplete global core product capability features
- (39) Non-discriminating global core product features
- (40) Insufficient behavioural requirements
- (41) Incomplete behavioural requirements
- (42) Non-discriminating behavioural requirements
- (43) All products rejected or eliminated
- (44) Requirements rejected - requirements can not be met by available products or technology

Appendix 4e: A List of the process chunks together with process goals and situations:

Begin-Process-Chunk

Name:1.0

Goal-1: reject products non-compliant with core essential atomic customer requirements

Processes: Acquire product information and requirements THEN

Analyse acquired information and requirements THEN

Determine product-requirement compliance THEN

Reject one or more non-compliant products

Situation: none

Content focus: none

Technique: { PORE method box }

End-Process-Chunk

Begin-Process-Chunk

Name: 1.2

Goal: 1.2 Analyse acquired information

Processes: Analyse acquired product information OR

Analyse acquired customer requirements OR

Analyse acquired supplier requirements OR

Analyse acquired contractual requirements

Situation: none

Input-information: none

Techniques: { PORE method box }

End-Process-Chunk

Begin-Process-Chunk

Name:1.3

Goal-1.1: Acquire product information and requirements

Processes: Acquire product information OR

Acquire customer requirements OR

Acquire supplier requirements OR

Acquire contractual requirements

Situation: none

Input-information: none

Technique(s): { PORE method box }

End-Process-Chunk

Begin-Process-Chunk

Name: 1.4

Goal-1.1.1: Acquire product information

Processes: none

Situation: empty (product sub-model)

Input-information: none

Techniques: { questionnaire, request-for-information, marketing literature }

End-Process-Chunk

Begin-Process-Chunk

Name: 1.5

Goal-1.1.2: Acquire product information

Processes: none

Situation: Insufficient product information

Input-information: content (product sub-model)

Techniques: { questionnaire, structured interview, request-for-information, card sort }

End-Process-Chunk

Begin-Process-Chunk

Name: 1.6

Goal-1.1.3: Acquire product information
Processes: none
Situation: non-discriminating product information
Input-information: content (product sub-model)
Techniques: {card-sort, questionnaire, request-for-information}
End-Process-Chunk

Begin-Process-Chunk
Name: 1.7
Goal-1.1.4: Acquire supplier information
Processes: none
Situation: Insufficient supplier requirements
Input-information: content (requirement sub-model)
Techniques: {questionnaire, structured interviews, request-for-information}
End-Process-Chunk

Begin-Process-Chunk
Name: 1.8
Goal-1.1.5: Acquire supplier information
Processes: none
Situation: non-discriminating supplier requirements
Input-information: content (requirement sub-model)
Techniques: {questionnaire, structured interviews, request-for-information}
End-Process-Chunk

Begin-Process-Chunk
Name: 1.9
Goal-1.1.6: Acquire contractual information
Processes: none
Situation: Insufficient contractual requirements
Input-information: content (requirement sub-model) *
Techniques: {questionnaire, structured interview}
End-Process-Chunk

Begin-Process-Chunk
Name: 1.10
Goal-1.1.7: Acquire contractual information
Processes: none
Situation: non-discriminating contractual requirements
Input-information: content (requirement sub-model) *
Techniques: {card-sort}
End-Process-Chunk

Begin-Process-Chunk
Name: 1.11
Goal-1.1.8: Acquire atomic essential customer requirements
Processes: none
Situation: empty (requirements sub-model)
Input-information: none
Techniques: {brainstorm, interview, use-case analysis, prototype}
End-Process-Chunk

Begin-Process-Chunk
Name: 1.12
Goal-1.1.9: Acquire atomic functional requirements
Processes: none
Situation: Insufficient behaviour requirements
Input-information: content (requirement sub-model)
Techniques: {prototype, use-case walkthrough}
End-Process-Chunk

Begin-Process-Chunk
Name: 1.13
Goal-1.1.10: Acquire atomic functional requirements
Processes: none
Situation: non-discriminating functional requirements
Input-information: content (requirement sub-model)
Techniques: {structured interviews, card-sort, prototype}
End-Process-Chunk

Begin-Process-Chunk
Name: 1.14
Goal-1.1.11: Acquire non-functional requirements
Processes: none
Situation: insufficient non-functional requirements
Input-information: content (requirement sub-model)
Techniques: {prototype, product-demos}
End-Process-Chunk

Begin-Process-Chunk
Name: 1.15
Goal-1.1.12: Acquire non-functional requirements
Processes: none
Situation: non-discriminating non-functional requirements
Input-information: content (requirement sub-model)
Techniques: {card-sorts, prototype}
End-Process-Chunk

Begin-Process-Chunk
Name: 1.16
Goal-1.1.13: Acquire architecture requirements
Processes: none
Situation: insufficient architecture requirements
Input-information: content (requirement sub-model)
Techniques: {direct and indirect scenario analysis, role analysis, architecture behaviour analysis}
End-Process-Chunk

Begin-Process-Chunk
Name: 1.17
Goal-1.1.14: Acquire architecture requirements
Processes: none
Situation: non-discriminating architecture requirements
Input-information: content (requirement sub-model)
Techniques: {SAAM, ATAM}
End-Process-Chunk

Begin-Process-Chunk
Name: 1.18
Goal-1.1.15: Acquire usability requirements
Processes: none
Situation: Insufficient usability requirements
Input-information: content (requirement sub-model)
Techniques: {prototype, business-event analysis, JAD}
End-Process-Chunk

Begin-Process-Chunk
Name: 1.19
Goal-1.1.16: Acquire usability requirements
Processes: none

Situation: non-discriminating usability requirements
Input-information: content (requirement sub-model)
Techniques: {card-sort}
End-Process-Chunk

Begin-Process-Chunk
Name: 1.20
Goal-1.2.1: Analyse requirement-product compliance
Processes: none
Situation: core requirements not mapped to any product feature
Input-information: content (compliance sub-model)
Techniques: {PORE method box}
End-Process-Chunk

Begin-Process-Chunk
Name: 1.21
Goal-1.2.2: Analyse requirement-product compliance
Processes: none
Situation: One core requirement not mapped to any product feature
Input-information: content (compliance sub-model)
Techniques: {compliance-mapping}
End-Process-Chunk

Begin-Process-Chunk
Name: 1.22
Goal-1.2.3: Analyse requirement-product compliance
Processes: none
Situation: all requirements mapped to all product features
Input-information: content (compliance sub-model)
Techniques: {compliance-mapping}
End-Process-Chunk

Begin-Process-Chunk
Name: 1.23
Goal-1.2.4: Analyse requirement-product compliance
Processes: none
Situation: no product-requirement mapping
Input-information content (compliance sub-model)
Techniques: {compliance mapping}
End-Process-Chunk

Begin-Process-Chunk
Name: 1.24
Goal-1.2.5: Analyse requirement-product compliance
Processes: none
Situation: non-discriminating requirements
Input-information: content (compliance sub-model)
Techniques: {card-sorts}
End-Process-Chunk

Begin-Process-Chunk
Name: 1.25
Goal-1.2.6: Analyse requirement-product compliance
Processes: none
Situation: non-discriminating product-features
Input-information: content (compliance sub-model)
Techniques: {card-sorts}
End-Process-Chunk

Begin-Process-Chunk

Name: 1.26
Goal-1.3: determine product-requirement compliance
Processes: none
Situation: no requirement-compliance mapping
Input-information: content (compliance sub-model)
Techniques: {compliance-checklist, compliance-walkthrough}
End-Process-Chunk

Begin-Process-Chunk
Name: 1.27
Goal-1.3.1: determine product-requirement compliance
Processes: none
Situation: no product-compliance mapping
Input-information: content (compliance sub-model)
Techniques: {compliance-checklist, compliance-walkthrough}
End-Process-Chunk

Begin-Process-Chunk
Name: 1.28
Goal-1.4: reject one or more non-compliant product
Processes: none
Situation: small (decision space)
Input-information: content (compliance sub-model)
Techniques: {AHP, MCDA, Out-ranking}
End-Process-Chunk

Begin-Process-Chunk
Name: 1.29
Goal-1.4.1: Identify new candidate products
Processes: none
Situation: all candidate products eliminated or rejected
Input-information: content (compliance sub-model)
Techniques: {electronic-requirementing, market survey}
End-Process-Chunk

Begin-Process-Chunk
Name:2.0
Goal-2: reject products non-compliant with non-essential atomic customer's requirements
Processes: Acquire product information and requirements THEN
 Analyse acquired information and requirements THEN
 Determine product-requirement compliance THEN
 Reject one or more non-compliant products
Situation: none
Content focus: none
Technique: {PORE method box}
End-Process-Chunk

Begin-Process-Chunk
Name:3.0
Goal-3: reject products non-compliant with complex non-atomic customer's requirements
Processes: Acquire product information and requirements THEN
 Analyse acquired information and requirements THEN
 Determine product-requirement compliance THEN
 Reject one or more non-compliant products
Situation: none
Content focus: none
Technique: {PORE method box}
End-Process-Chunk

Begin-Process-Chunk

Name:4.0

Goal-4: reject products non-compliant with customer's user requirements

Processes: Acquire product information and requirements THEN

Analyse acquired information and requirements THEN

Determine product-requirement compliance THEN

Reject one or more non-compliant products

Situation: none

Content focus: none

Technique: {PORE method box}

End-Process-Chunk

**Appendix 6a: Sample questionnaire sent to anti-virus product suppliers
(organisation B)**

(DEADLINE FOR RETURN: THURSDAY 29th DECEMBER 1997)

Dear Supplier

We are sending you this questionnaire as part of an anti-virus software product analysis in conjunction with a large International Bank. The Bank concerned is at the moment reviewing its anti-virus software product and looking at alternative products on the market. The product analysis is to be conducted at the City University, London. City University has developed expertise in the acquisition of customer requirements and selection of software products. The aim of this analysis is to recommend one or a suite of products which meet all or most of the Banks requirements.

This questionnaire which follows is an important part of the analysis. Its aim is to acquire basic product and supplier information. The basic requirements gathered as a result of the questionnaire, will determine those products to consider for the second phase of the product analysis.

Therefore it is highly recommended that the questionnaire be completed fully, any incomplete questionnaires will not be considered for the product analysis.

In total the Bank will require 4000 to 5000 licenses. These will vary depending on the type of license and the number of users at each of the banks branches. Currently the London Branch requires 200 licenses so any contract resulting from these studies will involve a large number of licenses.

The deadline for the return of the questionnaires is **THURSDAY 29th DECEMBER 1997**. Questionnaires received after this date will not be used for the analysis. We will inform you of our decision by **MONDAY 19th JANUARY 1998**.

All questionnaires must be returned to :

**Centre for HCI Design
City University
Northampton Square
London EC1V 0HB, UK.**

OR

If you wish you can also return the completed questionnaire via Email at the following address:

Email: dh105@city.ac.uk

[IF YOU FIND THAT THERE HAS NOT BEEN ENOUGH SPACE AVAILABLE IN THIS QUESTIONNAIRE THEN PLEASE ATTACH ANY RELEVANT MATERIAL AND ALLOCATE THE RELEVANT NUMBER FOR THAT QUESTION AT THE END OF THE QUESTIONNAIRE].

If you have any questions about this process or the questionnaire itself please do not hesitate to contact me at the above email address. Finally if you do not wish your identity, or the identity of the supplier to be made public, please tick this box .

I thank you for taking the time to complete the questionnaire.

XXXX
City University, London

1. BASIC PRODUCT INFORMATION

Please supply the following Product & Supplier information.

Product Name.....

Supplier name.....

Supplier Address
.....
.....
.....
.....

Supplier Telephone Number

Supplier Fax Number

Supplier contract representative

Supplier Email Address

[1.1] Please give an accurate description of the product ?

.....
.....
.....
.....
.....
.....
.....
.....

.....
.....
.....
.....

[ENCLOSE ANY RELEVANT MATERIAL IF NECESSARY]
2 SUPPLIER INFORMATION AND PRODUCT HISTORY

This section asks you to provide accurate and detailed information about your organization and the history of your product:

[2.1] How long has your organization been in business ?
.....
.....
.....

[2.2] How long has the product been available ?
.....
.....

[2.3] What is your organization's average annual turnover ?
.....
.....
.....

[2.4] How many copies of your product have been sold to date ?
.....
.....
.....

[2.5] What is the current version of your product ?
.....
.....
.....

[2.6] How many product versions have seen commercial release in the last year ?
.....
.....
.....

[2.7] How many product versions have seen commercial release in the last year four years ?
.....
.....
.....

[2.8] How many employees does your organization employ ?
.....
.....
.....

[2.9] What are the skills and experience levels of the key personnel(Development/Support staff) ?
.....
.....
.....

[2.10] How many customers does your organization have, please specify **only** those companies that use your anti-virus software product.
.....
.....

3 REQUIREMENTS COVERAGE

This section asks you to indicate the degree to which the product supports the mandatory/desirable properties such as functional and non-functional properties and gives you the chance to explain the technical features of your product.

[3.1] Functional Requirements Coverage

[3.1.2] Please indicate which (hardware) platform the product can run on
Please tick \surd and circle as appropriate:

	<input type="checkbox"/>	<i>Degree</i>
All Platforms	<input type="checkbox"/>	1 - 2 - 3 - 4 - 5 - 6 - 7
PC platform	<input type="checkbox"/>	1 - 2 - 3 - 4 - 5 - 6 - 7
Workstation	<input type="checkbox"/>	1 - 2 - 3 - 4 - 5 - 6 - 7
Client/Server	<input type="checkbox"/>	1 - 2 - 3 - 4 - 5 - 6 - 7
Protocols/Network Protocols supported	<input type="checkbox"/>	1 - 2 - 3 - 4 - 5 - 6 - 7

[3.1.3] Please indicate which environment(s) does the product support

Please tick \surd the box and circle the number as appropriate:

	<input type="checkbox"/>	<i>Degree</i>
Single user	<input type="checkbox"/>	1 - 2 - 3 - 4 - 5 - 6 - 7
Multiple user	<input type="checkbox"/>	1 - 2 - 3 - 4 - 5 - 6 - 7
Enterprise-wide	<input type="checkbox"/>	1 - 2 - 3 - 4 - 5 - 6 - 7
Distributed	<input type="checkbox"/>	1 - 2 - 3 - 4 - 5 - 6 - 7

[3.1.4] Is the product compatible with and able to function on the following operating systems:
Please tick \surd the box and circle the number as appropriate:

	<input type="checkbox"/>	<i>Degree</i>
Windows NT	<input type="checkbox"/>	1 - 2 - 3 - 4 - 5 - 6 - 7
Windows 95	<input type="checkbox"/>	1 - 2 - 3 - 4 - 5 - 6 - 7
Windows 3.1/11	<input type="checkbox"/>	1 - 2 - 3 - 4 - 5 - 6 - 7
Novell 3.12	<input type="checkbox"/>	1 - 2 - 3 - 4 - 5 - 6 - 7
Novell 4.1	<input type="checkbox"/>	1 - 2 - 3 - 4 - 5 - 6 - 7
DOS	<input type="checkbox"/>	1 - 2 - 3 - 4 - 5 - 6 - 7
OS/2	<input type="checkbox"/>	1 - 2 - 3 - 4 - 5 - 6 - 7
UNIX	<input type="checkbox"/>	1 - 2 - 3 - 4 - 5 - 6 - 7
Others (PLEASE STATE)		

.....

[3.1.5] Please indicate in the table below the hardware requirements for your product for the following operating systems. For each please specify the minimum hardware Requirement that is required for your product to run successfully on each of the operating systems.

HARDWARE REQUIREMENTS	OPERATING SYSTEM							
	Windows NT	Windows 95	Windows 3.1/11	Novell 3.12	Novell 4.1	OS/2	UNIX	Others
Processor Requirements (MHz)								
Minimum Memory Required (RAM)								
Minimum disk space (Hard) Required (MB RAM)								

[3.1.6] The product shall detect and remove the following type of viruses
 Please tick the box and circle the number as appropriate:

	<i>Degree</i>
Boot Sector Viruses	1 - 2 - 3 - 4 - 5 - 6 - 7
Partition Sector Virus	1 - 2 - 3 - 4 - 5 - 6 - 7
File Viruses	1 - 2 - 3 - 4 - 5 - 6 - 7
Polymorphic Virus	1 - 2 - 3 - 4 - 5 - 6 - 7
Multi-Partite Virus	1 - 2 - 3 - 4 - 5 - 6 - 7
Executables	1 - 2 - 3 - 4 - 5 - 6 - 7
Macro Viruses	1 - 2 - 3 - 4 - 5 - 6 - 7
Cluster Infectors	1 - 2 - 3 - 4 - 5 - 6 - 7
Stealth viruses	1 - 2 - 3 - 4 - 5 - 6 - 7
Others [please specify]	_____

[3.1.7] The product shall scan, detect and prevent viruses on the following Groupware products:
Please tick the box and circle the number as appropriate:

		<i>Degree</i>
Lotus notes	<input type="checkbox"/>	1 - 2 - 3 - 4 - 5 - 6 - 7
Microsoft Exchange	<input type="checkbox"/>	1 - 2 - 3 - 4 - 5 - 6 - 7
Others	<input type="checkbox"/>	1 - 2 - 3 - 4 - 5 - 6 - 7

Comments.....
.....
.....
.....

[3.1.8] The product shall scan and detects virus infected emails and email attachments for email borne viruses /monitor incoming and outgoing email ?
(YES/NO)

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments.....
.....
.....

[3.1.9] The product shall monitor, detect and prevent Internet borne viruses ?
(as these are not intercepted by server-based anti-virus products)
(YES/NO)

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments.....
.....
.....
.....

[3.1.10] The product shall provide a feature for real-time scanning ?
(YES/NO)

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments.....
.....
.....
.....

[3.1.11] The product shall provide a feature where scanning can be performed immediately or a scheduled ?
(YES/NO)

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments.....
.....
.....
.....
.....

[3.1.12] The product shall provide a feature for multiple scans at different times ?
(YES/NO)

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments.....
.....
.....
.....
.....

[3.1.13] The product shall provide a feature were scanning can start on boot up?
(YES/NO)

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments.....
.....
.....
.....

[3.1.14] How long does it take the application to scan a workstation for viruses ?

Comments.....
.....
.....
.....

[3.1.15] The product shall keep a log of viruses detected?
(YES/NO)

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments.....
.....
.....
.....

[3.1.16] The product shall make infected files inaccessible to the user and prevents the user from opening a file either from diskette or off the server which has is found to have been infected ?
(YES/NO)

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments.....
.....
.....
.....

[3.1.17] The product shall remove infected file to a secure location ?
(YES/NO)

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments.....
.....
.....

[3.1.18] The product shall automatically disinfect an infected file ?
(YES/NO)

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments.....
.....

[3.1.19] The product shall provide details on the virus that has effected a document ?
(YES/NO)

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments.....
.....
.....

[3.1.20] The product shall provide documentation ?
(e.g. instructions on installation, use and management of the application)
(YES/NO)

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments.....
.....
.....
.....

[3.1.21] The Supplier shall provide an Internet site where customers can download an updated signature file?

(YES/NO)

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

If the answer is YES to 1.2 then please indicate the location on the Internet (WWW)
Location:-

[3.1.22] The product shall have an alert system built into the product to broadcast to relevant personnel (IT staff) that a virus has been found ?
(YES/NO)

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments.....
.....
.....
.....
.....

[3.1.23]The product shall work as it is or will it need some modifications ?

Comments.....
.....

.....
.....
.....
.....
.....

[3.2] Non-functional Requirements Coverage

[3.2.1] What Hardware/communication setup does it require ?

.....
.....
.....
.....
.....
.....
.....
.....

[3.2.2] What other supporting packages does it use or depend on ?

.....
.....
.....
.....
.....
.....
.....

4 TECHNICAL SUPPORT ARRANGEMENTS

This section asks you to indicate the licensing arrangement and the type of technical support available.

[4.1] What are the available licensing arrangements and cost per license ?

.....
.....
.....

[4.2] Are there any costs for technical support, training and maintenance ?

.....
.....
.....

[4.3] Is there any extra support provided for high-risk and critical systems ?

.....
.....

[4.4] What is your organization policy on updating signature files?

.....
.....

.....
.....
.....
[4.12] Are demo copies available and if there are what are the licensing arrangements ?
.....
.....
.....

5 CONTRACT CONDITIONS

This section asks you to indicate the contractual conditions and other related issues.

[5.1]What are your organization’s contract terms and procurement conditions ?
.....
.....
.....

[5.2] What are the conditions and criteria for accepting the contract ?
.....
.....
.....

[5.3] What are the conditions for extra technical support ?
.....
.....
.....

[5.4] What are the pricing and paying conditions ?
.....
.....
.....

[5.5] Are there any extra legal issues?
.....
.....
.....

[5.6] What are the arrangements and conditions for contract termination ?
.....
.....
.....

THANK YOU FOR COMPLETING THE QUESTIONNAIRE

Appendix 6b: Questionnaire response from product supplier

1. BASIC PRODUCT INFORMATION

Please supply the following Product & Supplier information.

Product

Name Dr Solomon's Anti-Virus Toolkit

Supplier

name Dr Solomon's Software Ltd

Supplier Address

Alton House
Gatehouse Way
Aylesbury
Bucks HP19 3XU

Supplier Telephone Number 01296 318700

Supplier Fax Number 01296 318888

Supplier contract representative Graham Mann

Supplier Email Address graham.mann@uk.drsolomon.com

[1.1] Please give an accurate description of the product ?

Dr Solomon's Anti-Virus Toolkit consists on-demand and on-access scanners, a checksummer plus a scheduling capability. There are versions for all common workstation platforms, including: DOS, Windows 3.x, 3.11, 95, NT, Mac, OS/2. Server versions are also available for NT, Netware and some UNIX boxes. The NT server version includes Management Edition which provides deployment, AV management and reporting throughout the anti-virus domain (the current beta version includes management across Netware servers). To provide complete protection GroupWare products for Lotus Notes and MS Exchange and a MailGuard product for SMTP mail users are also available. All products contain heuristic analysis to enable detection of 80% of viruses not currently known, including macro viruses. Auto-disinfect provides virus clean-up without external intervention across the product range except for MailGuard. Dr Solomon's products include disinfection drivers for ALL viruses known to Dr Solomon's, whether in the wild or not. Where the virus is not known to Dr Solomon's but was identified through heuristics the infected file is quarantined by the product and can then be sent to Dr Solomon's for a disinfection driver to be created. These disinfection drivers can be incorporated within the product within 48 hrs. The products are available in both diskette and CD ROM versions, on-line is currently being rolled out amongst our larger corporate customers. The on-demand scanner scans recursively inside compressed files without writing anything to disk. The products are updated on a monthly or quarterly cycle. The engine is updated monthly to ensure accurate detection with the minimum of false alarms.

See the product sheets for more details.

[ENCLOSE ANY RELEVANT MATERIAL IF NECESSARY]

2 SUPPLIER INFORMATION AND PRODUCT HISTORY

This section asks you to provide accurate and detailed information about your organization and the history of your product:

[2.1] How long has your organization been in business ?

13 years

[2.2] How long has the product been available ?

1989 saw the first DOS version and the other platforms were added later.

[2.3] What is your organization's average annual turnover ?

A copy of our annual report has been sent under separate cover.

[2.4] How many copies of your product have been sold to date ?

This is impossible to even estimate, we ship hundred's of thousands of Toolkits each month. As a guide we believe we have some 10 million users worldwide.

[2.5] What is the current version of your product ?

Current shipping version is 7.79

[2.6] How many product versions have seen commercial release in the last year ?

12 - the product is updated monthly to ensure the most accurate detection without false alarms.

[2.7] How many product versions have seen commercial release in the last year four years ?

48 as there is a new version produced every month.

[2.8] How many employees does your organization employ ?

478

[2.9] What are the skills and experience levels of the key personnel(Development/Support staff) ?

In the main they are qualified Netware, NT and Windows engineers. Dr Solomon's have the largest Anti-Virus Team in the world.

[2.10] How many customers does your organization have, please specify **only** those companies that use your Anti-virus software product.

100,000

[2.11] Can you supply at least two references where your product has been or is being currently used? **(note these referees may be approached)**

BT, Lloyds TSB, ICL, Coopers & Lybrand, The Post Office, Unilever, UBS. Because of the sensitive nature of anti-virus software please contact us when you wish to take up references and we will supply you with the contact names and numbers.

[2.12] Please give a brief history of your organization ?

Originally called S&S Enterprises, the original company specialised in computer security consultancy and gradually developed a reputation for virus detection and repair. The company was started around 1984 by Dr Alan and Susan Solomon. As the number of virus infections grew so did the S&S Enterprises. Dr Solomon soon realised that the most efficient and cost-effective way for companies to protect themselves from the virus threat was to develop a software program. This software program became known as 'Dr Solomon's Anti-Virus Toolkit' after the collection of tools Alan carried with him to disinfect and repair his customers files. The name was changed to S&S International PLC and in 1993 received the Queens Award for Technological Achievement for Dr Solomon's virus transaction language (VIRTRAN). In February 1996 the company was sold to three directors in a management buyout. In November of that year the Dr Solomon's Group was floated on NASDAQ and EASDAQ. Dr Solomon's have two other products: Dr Solomon's Audit and Dr Solomon's Support Software. (See <http://www.drsolomon.com/products/avtk/reviews> for independent reviews of our products.)

[2.13] Is your organization internationally based/ have you branches in any other countries ?
(YES/NO)

Yes

[2.13.1] If the answer to [2.13] is YES please indicate in which countries you have sites:

USA (Burlington, Mass is the US HQ but there are three other sites)

Germany (Hamburg is the German HQ but there is a further development site in Germany)

Australia (Melbourne)

We also have 54 partners who cover 98 countries.

[2.14] What commercial or industrial standards does your product comply with ?

Year 2000 compliant as per BSI document DISC PD2000-1

Netware self-certification

Windows 95 certification

We have 4 members of CARO

Dr Solomon's Quality System is based on ISO 9001/ISO 9000-3 (TickIT) although it is not our main priority to become certified

Some sections of this questionnaire will ask you to indicate the degree of assistance provided by your product on a scale of 1 to 7.

Where 1 = Minimum compliance
& 7 = Maximum compliance

Please circle the relevant number as appropriate.

e.g.

Degree

1 - 2 - 3 - 4 - 5 - **6** - 7

You also have the option to make comments. These comments can be either entered into the questionnaire or make clear references to additional documents and pages provided to support the questionnaire.

3 REQUIREMENTS COVERAGE

This section asks you to indicate the degree to which the product supports the mandatory/desirable properties such as functional and non-functional properties and gives you the chance to explain the technical features of your product.

[3.1] **Functional Requirements Coverage**

[3.1.2] Please indicate which (hardware) platform the product can run on
Please tick \checkmark and circle as appropriate:

	<input type="checkbox"/>		<i>Degree</i>
All Platforms	<input type="checkbox"/>		1 - 2 - 3 - 4 - 5 - 6 - 7
PC platform	<input type="checkbox"/>	\checkmark	1 - 2 - 3 - 4 - 5 - 6 - <u>7</u>
Workstation	<input type="checkbox"/>	\checkmark	1 - 2 - 3 - 4 - 5 - 6 - <u>7</u>
Client/Server	<input type="checkbox"/>	\checkmark	1 - 2 - 3 - 4 - 5 - <u>6</u> - 7
Protocols/Network Protocols supported	<input type="checkbox"/>	\checkmark	1 - 2 - 3 - 4 - 5 - <u>6</u> - 7

[3.1.3] Please indicate which environment(s) does the product support

Please tick \checkmark the box and circle the number as appropriate:

	<input type="checkbox"/>		<i>Degree</i>
Single user	<input type="checkbox"/>	\checkmark	1 - 2 - 3 - 4 - 5 - 6 - <u>7</u>
Multiple user	<input type="checkbox"/>	\checkmark	1 - 2 - 3 - 4 - 5 - 6 - <u>7</u>
Enterprise-wide	<input type="checkbox"/>	\checkmark	1 - 2 - 3 - 4 - 5 - 6 - <u>7</u>
Distributed	<input type="checkbox"/>	\checkmark	1 - 2 - 3 - 4 - 5 - <u>6</u> - 7

[3.1.4] Is the product compatible with and able to function on the following operating systems:
Please tick \checkmark the box and circle the number as appropriate:

	<input type="checkbox"/>		<i>Degree</i>
Windows NT	<input type="checkbox"/>	\checkmark	1 - 2 - 3 - 4 - 5 - 6 - <u>7</u>
Windows 95	<input type="checkbox"/>	\checkmark	1 - 2 - 3 - 4 - 5 - 6 - <u>7</u>
Windows 3.1/11	<input type="checkbox"/>	\checkmark	1 - 2 - 3 - 4 - 5 - 6 - <u>7</u>
Novell 3.12	<input type="checkbox"/>	\checkmark	1 - 2 - 3 - 4 - 5 - <u>6</u> - 7
Novell 4.1	<input type="checkbox"/>	\checkmark	1 - 2 - 3 - 4 - 5 - 6 - <u>7</u>
DOS	<input type="checkbox"/>	\checkmark	1 - 2 - 3 - 4 - 5 - 6 - <u>7</u>
OS/2	<input type="checkbox"/>	\checkmark	1 - 2 - 3 - 4 - 5 - <u>6</u> - 7
UNIX SCO	<input type="checkbox"/>	\checkmark	1 - 2 - 3 - 4 - 5 - 6 - <u>7</u>

Others (PLEASE STATE) Macintosh Toolkit
 Lotus Domino
 MS Exchange
 MailGuard (SMTP mail systems)
 UNIX Alpha

Virex (Macintosh)
 NetOctopus (Macintosh)
 Foreign language versions of the Toolkits

[3.1.5] Please indicate in the table below the hardware requirements for your product for the following operating systems. For each please specify the minimum hardware Requirement that is required for your product to run successfully on each of the operating systems.

The Toolkit will run on any pc as long as the pc will support the operating system. The hardware requirements are directly related to the speed and efficiency required by the user. The figures supplied are examples only.

HARDWARE REQUIREMENTS	OPERATING SYSTEM							
	Windows NT	Windows 95	Windows 3.1/11	Novell 3.12	Novell 4.1	OS/2	UNIX	Others
Processor Requirements (MHz)	P90	P75	486/133	386	P75			
Minimum Memory required (RAM)	32mb	16mb	8mb	5mb	5mb			
Minimum disk space (Hard) required (MB RAM)	5mb	5mb	5mb	5mb	5mb	5mb	5mb	

[3.1.6] The product shall detect and remove the following type of viruses
 Please tick ✓ the box and circle the number as appropriate:

	<i>Degree</i>
Boot Sector Viruses	1 - 2 - 3 - 4 - 5 - 6 - <u>7</u>
Partition Sector Virus	1 - 2 - 3 - 4 - 5 - 6 - <u>7</u>
File Viruses	1 - 2 - 3 - 4 - 5 - 6 - <u>7</u>
Polymorphic Virus	1 - 2 - 3 - 4 - 5 - 6 - <u>7</u>
Multi-Partite Virus	1 - 2 - 3 - 4 - 5 - 6 - <u>7</u>
Trojan Horse	1 - 2 - 3 - 4 - 5 - 6 - <u>7</u>
Worm	1 - 2 - 3 - 4 - 5 - 6 - <u>7</u>
Executables	1 - 2 - 3 - 4 - 5 - 6 - <u>7</u>

Macro Viruses	1 - 2 - 3 - 4 - 5 - 6 - <u>7</u>
Cluster Infectors	1 - 2 - 3 - 4 - 5 - <u>6</u> - 7
Stealth viruses	1 - 2 - 3 - 4 - 5 - 6 - <u>7</u>
Others [please specify]	_____

[3.1.7] The product shall scan, detect and prevent viruses on the following groupware products:
Please tick the box and circle the number as appropriate:

		<i>Degree</i>
Lotus notes	<input type="checkbox"/> <input checked="" type="checkbox"/>	1 - 2 - 3 - 4 - 5 - 6 - <u>7</u>
Microsoft Exchange	<input type="checkbox"/> <input checked="" type="checkbox"/>	1 - 2 - 3 - 4 - 5 - 6 - <u>7</u>
Others	<input type="checkbox"/> <input checked="" type="checkbox"/>	1 - 2 - 3 - 4 - 5 - <u>6</u> - 7

Comments MailGuard does not have an auto-disinfect facility as does both the Notes and MS Exchange products. The MS Exchange product also comes with a mailbox scanner to ensure that old mail cannot re-infect.

[3.1.8] The product shall scan and detects virus infected emails and email attachments for email borne viruses /monitor incoming and outgoing email ?
(YES/NO)

Yes

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments MailGuard is designed to intercept all inbound and outbound SMTP mail. All attachments are checked for viruses and quarantined if a virus is detected. MailGuard runs on an NT server patched into the SMTP gateway.

.....
.....
.....

[3.1.9] The product shall monitor, detect and prevent internet borne viruses ?
(as these are not intercepted by server-based antivirus products)
(YES/NO)

Yes

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments. WinGuard our on -access scanner will detect any viruses that are downloaded from the Web. Dr Solomon's are currently working on a Web product that will protect our customers from the threat of Java and Active X mischievous applets which are the virus threat of the future.

.....
.....
.....

[3.1.10] The product shall provide a feature for real-time scanning ?
(YES/NO)

Yes

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments WinGuard scans the desktop in real-time and can be configured to scan on both reads and writes. Real-time scanning is also a feature of all our other products mentioned in this questionnaire.

.....
.....
.....
.....

[3.1.11] The product shall provide a feature where scanning can be performed immediately or a scheduled ?
(YES/NO)

Yes

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments Each Toolkit has it's own scheduler but the on-demand scanner can be run immediately.

.....
.....
.....
.....

[3.1.12] The product shall provide a feature for multiple scans at different times ?
(YES/NO)

Yes

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments

The Scheduler provides this functionality.

.....
.....
.....

[3.1.13] The product shall provide a feature were scanning can start on boot up?
(YES/NO)

Yes

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments WinGuard scans the memory at boot-up. Also a complete scan can be made by editing the Autoexec.bat file to run Dr Solomon's findvirus at start-up. In many organisations server scripts are used to scan on start-up.

.....
.....

[3.1.14] How long does it take the application to scan a workstation for viruses ?

Comments The time is dependent upon the power of the computer, the number of files to be scanned and whether there are any compressed files present.

.....
.....
.....

[3.1.15] The product shall keep a log of viruses detected?
(YES/NO)

Yes

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments The products log virus incidents to a local file or to the network. NT Management Edition provides a central logging facility for virus incidents throughout the anti-virus domain.
.....
.....
.....

[3.1.16] The product shall make infected files inaccessible to the user and prevents the user from opening a file either from diskette or off the server which has is found to have been infected ?
(YES/NO)

Yes

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments If the virus is known to the software and it is able to automatically disinfect the virus it will. Otherwise the file will be quarantined.....
.....
.....

[3.1.17] The product shall remove infected file to a secure location ?
(YES/NO)

Yes

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments Files are automatically quarantined in cases where the infection cannot be disinfected by the software.
.....
.....
.....

[3.1.18] The product shall automatically disinfect an infected file ?
(YES/NO)

Yes

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments The Toolkit will disinfect most viruses automatically without the need for user intervention. Some viruses such as boot sector viruses cannot be automatically disinfected, also there are certain macro viruses which so damage the macro that they cannot be completely eradicated.

[3.1.19] The product shall provide details on the virus that has effected a document ?
(YES/NO)

Yes

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments A virus encyclopedia is provided with the products. WinGuard will provide the name of known viruses detected.
.....
.....

[3.1.20] The product shall provide documentation ?
(e.g. instructions on installation, use and management of the application)
(YES/NO)

Yes

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments There are hard copy manuals and the CD ROM version includes the manuals also.
Technical Support is free.

.....
.....
.....

[3.1.21] The Supplier shall provide an internet site where customers can download an updated signature file?

(YES/NO)

Yes

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

If the answer is YES to 1.2 then please indicate the location on the internet (WWW)
Location:- Our Web site is <http://www.drSolomon.com>.....

[3.1.22] The product shall have an alert system built into the product to broadcast to relevant personnel (IT staff) that a virus has been found ?
(YES/NO)

Yes

Degree 1 - 2 - 3 - 4 - 5 - 6 - 7

Comments. The products notify the relevant person(s) within the support team that a virus has been detected, however, this only happens if the virus is detected by either our server, groupware or MailGuard products unless NT Management Edition is used, in which case notification will be received where a user contracts a virus.

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.....

[3.1.23]The product shall work as it is or will it need some modifications ?

Comments The products will work as installed although they are fully configurable.

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.....

[3.2] *Non-functional Requirements Coverage*

[3.2.1] What Hardware/communication setup does it require ?

There are not hardware setups required but certain products like server, groupware and MailGuard products will require configuration. This information is available from the documentation.

.....
.....
.....

[3.2.2] What other supporting packages does it use or depend on ?

Known save the operating system.

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.....
.....
.....
.....

4 TECHNICAL SUPPORT ARRANGEMENTS

This section asks you to indicate the licensing arrangement and the type of technical support available.

[4.1] What are the available licensing arrangements and cost per license ?
The products can be purchased as boxed products or can be licensed by site. The decision is dependent upon the size of the organisation. Site licences can be purchased for multiple years up front with 3 being the norm.
The cost is dependent on the number of pc's, servers, mail users covered and is broken down into ranges with price breaks. For example: a company with 2000 pc's and servers could expect to pay £13.80 per pc/server or £15.30 including MailGuard, Domino or MS Exchange.
A Company with 50,000 pc's/servers would expect to pay £3.45 for pc's/servers and £3.91 for pc's/servers and MailGuard, Domino or MS Exchange.

[4.2] Are there any costs for technical support, training and maintenance ?
Technical Support and maintenance are included within the licence costs and there is not extra charge. Large corporates will receive our Gold Service automatically which offers a higher degree of support and information (no extra charge is made for this service). We regularly run public Live Virus Workshops and also provide customised courses. Other training programmes are available as required. All training is chargeable and is NOT incorporated in the licence.

[4.3] Is there any extra support provided for high-risk and critical systems ?
We provide a Gold Service to major corporate customers which includes dedicated Technical Support person and a monthly news letter plus virus alert. Where additional support is required this is handled by our Consultancy Division who provide everything from Internal Help Desk to full outsourcing of the all anti-virus activities.

.....
[4.4] What is your organization policy on updating signature files?
We currently update signature files on a quarterly or monthly basis but we are trailing weekly updates which will go live from February '98. Where a virus is identified by a customer that was not known to us at the time of producing the current product we will produce a detection and disinfection driver within 48hrs. These drivers are also available from our Web site.

[4.5] Will you provide free updates for all future product versions ?
(YES/NO)
Yes and No

[4.6] If you have answered NO to [4.5] then please specify all future conditions and costs for receiving version upgrades.
Updates are provided as part of a Corporate Site Licence for the term of that licence but not after the licence has expired.

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.....
.....

[4.7] Is user and system documentation provided and what are the costs ?
Yes , manuals and provided in hard copy form and on the CD ROM version. They cost is incorporated into the licence price unless additional sets are required in hard copy for which a £15 charge is made per copy.

A Virus encyclopedia is also supplied with the initial licence. Technical Notes are provided to customers where changes have been made to the operation of the software.

[4.8] How long will you continue supporting this product ?

Anti-virus is the major part of our business and accounts for the lions share of our turnover. There are no plans to move away from anti-virus or to discontinue support for the Toolkit, we have invested heavily in the product during the pass year and have long term plans for it's future which we regularly share with our major customers.

[4.9] What kind of help is available to learn about the product and to solve problems ?

We offer free technical support, we regularly run Live Virus Workshops to provide valuable knowledge on virus and how to deal with the virus threat. Customised training programmes are also available. Our Consultancy Division provide both training and hands on installation, if required. Consultants can be hired on a daily basis to resolve problems and where the problem is found to be with our software no charge is made for their time.

[4.10] Are there any additional costs such as annual support, runtime licenses, end-user documentation, upgrade and update(definition files) costs ?

(YES/NO)

Yes

If there are what are the arrangements?

The only charges likely are for additional copies of the manuals or additional sets of disks/CD ROMS over and above the initial number allowed within the licence. Charges are also levied for freight and handling if multiple sites are to be sent copies directly by Dr Solomon's, this includes international freight charges which are passed on at cost. Consultancy and training costs are also additional to the licence fee.

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.....

[4.11] Is training provided and if there is , how much does it cost ?

Training is provided in the form of either public or private Live Virus Workshops (£695 for 2 day course). Customised training courses are also available with prices quoted on request. Our consultancy costs are £600 per day plus expenses. Consultancy rates will be reduced according to the length of the consultancy.

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.....
.....

[4.12] Are demo copies available and if there are what are the licensing arrangements ?

Evaluation copies are available. A basic Toolkit can be downloaded from the Web but evaluation copies for all products can be obtained from Dr Solomon's on a 30 day trail basis, after which they must be purchased or returned.

.....
.....

5 CONTRACT CONDITIONS

This section asks you to indicate the contractual conditions and other related issues.

[5.1]What are your organization's contract terms and procurement conditions ?

See our terms and conditions under sent under separate cover. We offer Corporate Site Licences for 1, 2 or 3 years, although longer periods have been negotiated. Substantial discounts are available for up-front payments and leases can be assigned to take advantage of these discounts but still make annual payments.

.....

[5.2] What are the conditions and criteria for accepting the contract ?
In all cases money is payable up front.

.....
.....

[5.3] What are the conditions for extra technical support ?
The Gold Service is automatically available to large corporates.
Additional Technical Support would be by negotiation with our Consultancy Division.

.....
.....
.....

[5.4] What are the pricing and paying conditions ?
Pricing is based on the number of pc's/servers and users of Domino/MS Exchange or MailGuard. The price reduces on a sliding scale dependent on the size of the organisation.
Payment is up front and within 30 days of invoice. With multiple year deals the full payment must be made in advance although the licence may be assigned to spread the cost over the period of the licence.

[5.5] Are there any extra legal issues?
Not over and above the Terms and Conditions which you have a copy of .

.....
.....
.....

[5.6] What are the arrangements and conditions for contract termination ?
This information is in our Terms and Conditions.

.....
.....

THANK YOU FOR COMPLETING THE QUESTIONNAIRE

Appendix 6c: Sample of letter sent to suppliers to invite them to attend a product demonstration session

Dear.....

The questionnaire about your product for a large International Bank was an important part of the first phase of the product analysis. The aim of the analysis was to acquire basic product and supplier information. The basic requirements gathered as a result of the questionnaire determined those products to select for the second phase.

.....was successful in meeting the customers basic requirements. Therefore for the second and final phase of the product analysis I would like a member of your team to demonstrate your products to the selection team in order to determine the products compliance to the banks requirements.

Your product will need to show its features in the following areas:

*Operating System / Network Operating System Compliance
Scanning & Detection of viruses on Workstation and Server
Scanning & Detection of viruses on Groupware products (Lotus Notes, Microsoft Exchange)
Scanning & Detection of viruses on Email SMTP,
Scanning & Detection of viruses on Internet
Log and Alert Features
and finally analysis of the documentation provided for your product.*

The demonstration will be held at the City University, London. Directions. Details on how to get to the university are enclosed in this email attachment called Map.doc.

Please bring with you any necessary equipment in order to demonstrate each of the aspects of your product mentioned above for the purpose of the demonstration.

Furthermore could you also bring with you a collection of 3 to 4 different viruses for the following virus types .

Boot Sector Viruses
Partition Sector Virus
File Viruses
Multi-Partite Virus
Executables
Macro Viruses
Cluster Infectors
Stealth viruses

These viruses will be required to demonstrate whether or not your product can detect and disinfect viruses for each of the virus types.

The demonstration session itself can commence as of Thursday of this week (05/03/98) and onwards. Please email me giving a date and a time at which you are

available to conduct the Product demonstration. Pending your response I shall make the necessary arrangements.

regards

Team Leader

•
•

Appendix 6d: Sample of acceptance test cases

STRUCTURE OF ACCEPTANCE TEST

The Acceptance Test is set out as follows;

Acceptance Test 1 (T1)

Workstation/Server

The following aspects of both a workstation and a server shall be tested:

- T1.1 Scanning**
 - T1.1.1 Scanning (ON-DEMAND) Workstation**
 - T1.1.2 Scheduling (Workstation/server)**
 - T1.1.3 BOOT UP SCANNING(Workstation/server)**
- T1.2 Detection (Virus Types) /Disinfection or removal**
 - T1.2.1 Detection & Disinfection**
 - T1.2.2 On-Demand Scanner Detection**
 - T1.2.3 On-Access Scanner Detection**
- T1.3 LOG**
- T1.4 ALERT**
- T1.5 Operating system/ Network Operating system compliance**

Acceptance Test 2 (T2)

Groupware

Acceptance Test 3 (T3)

Email SMTP(Simple Mail Transfer Protocol)

Acceptance Test 4 (T4)

Internet (Internet borne virus detection / Internet Update Web site)

Acceptance Test 5 (T5)

Documentation

THE ACCEPTANCE TEST INCLUDES CHECKS ON EACH OF THE TASKS SET. THESE CHECKS ARE USED TO RATE THE PRODUCTS FIT TO REQUIREMENTS WHERE 1= VERY POOR FIT AND 7 = EXCELLENT FIT. THEREFORE RATE EACH CHECK ACCORDING TO THE PRODUCTS FIT TO THE REQUIREMENT.

Acceptance Test 1

Workstation/Server Task-1 (T1)

This next acceptance test explores the following areas related to Client(Workstation) and Server systems

- T1.1** Scanning
- T1.2** Detection (Virus Types) /Disinfection or removal
- T1.3** LOG
- T1.4** ALERT

T1.1 Scanning

This section explores the scanning requirements of the suppliers product on both the workstation and server.

Scanning (ON-DEMAND) Workstation/Server

This section shall test the ON-DEMAND scanning requirements of the product. It shall test the products scanning ability on a workstation / server (If possible connected to a network).

Task

T1.1.1:The product shall be able to scan selected drives, multiple drives, directories, and folders.

Instruction

Launch the product to scan the hard drive, a folder and the floppy drive on the workstation / server.

Check

1.1.1a:The product shall be able to successfully scan selected drives and folders.
1-2-3-4-5-6-7

1.1.1b:During the process of the scan the product shall be able to give details of the percentage scanned so far (in a graphical /figure readable form)..
1-2-3-4-5-6-7

1.1.1c:Whilst scanning the product shall highlight the location of the file currently under scan i.e. C:/ Windows/ Word/Test.doc
1-2-3-4-5-6-7

1.1.1d:The product shall be able to scan the hard drive of the workstation/ server.
1-2-3-4-5-6-7

1.1.1e:The product shall be able to scan a specific network drive.
1-2-3-4-5-6-7

1.1.1f:The product shall be able to scan a diskette on a workstation.
1-2-3-4-5-6-7

1.1.1g:The product shall be able to scan multiple drives during one scan of the computer.
1-2-3-4-5-6-7

1.1.1h:The product shall allow user to select any drive or folder for scanning purposes.

1-2-3-4-5-6-7

1.1.1i:The product shall allow for scanning of the entire network from any client workstation.

1-2-3-4-5-6-7

1.1.1j:The product shall have a feature for background scanning of the workstation/ server.

1-2-3-4-5-6-7

1.1.1k:The product shall be able to scan compressed files.

1-2-3-4-5-6-7

Scheduling (Workstation/Server)

This section explores the products requirements relating to scheduling.

Task

T1.1.2:The product shall provide a feature where scanning can be scheduled.

Instructions

Set the schedule for the scanner to operate at _____:_____

Set the schedule for the scanner to operate at multiple times for the purpose of this test set one at _____:_____ and the other at _____:_____ (leaving a 5min gap between each)

Checks

1.1.2a:The product shall scan successfully at the required time.

1-2-3-4-5-6-7

1.1.2b:The product shall provide a feature for scanning at any time during the day.

1-2-3-4-5-6-7

1.1.2c:The product can be scheduled for multiple scans during the course of a day.

1-2-3-4-5-6-7

1.1.2d:The product shall scan successfully when multiple schedules are set.

1-2-3-4-5-6-7

1.1.2e:The product can be scheduled for multiple scans during the course of a week.

1-2-3-4-5-6-7

BOOT UP Scanning(Workstation/Server)

Task

T1.1.3:The product shall provide a feature where scanning can start on BOOT UP.

Instructions

Demonstrate how your product can scan on BOOT UP.

Checks

1.1.3a:The products shall scan on BOOT UP.

1-2-3-4-5-6-7

1.1.3b:The product shall scan all the files on the workstation (.doc/.com./exe etc..) on BOOT UP.

1-2-3-4-5-6-7

1.1.3c:The OS/NOS shall successfully be loaded after Booting Up the workstation under the product.

1-2-3-4-5-6-7

T1.2 Detection (Virus Types) /Disinfection or removal

This section explores how well the product on the server and client workstation detects and disinfects or removes an infected file.

Detection & Disinfection

Task

T1.2.1:The product shall detect and disinfect or (if it is not possible to disinfect a file) to move infected file to secure location.

Instructions

(FOR WORKSTATION) Please demonstrate the above task by scanning the infected diskette provided.

(FOR SERVER) Please demonstrate how your product shall detect and disinfect or (if it is not possible to disinfect a file) to move infected file to secure location. A file on the network should be infected with a virus.

Checks

1.2.1a:The product shall successfully detect an infected file on diskette/ on the server

1-2-3-4-5-6-7

1.2.1b:The product shall successfully either disinfect or move infected file to a secure location.(If it is not able to disinfect it).

1-2-3-4-5-6-7

1.2.1c:The product shall provide details on the virus detected in a document.
1-2-3-4-5-6-7

Virus Types

This part of the section shall explore how well the product detects and disinfects the various different virus types. It will test the detection and disinfection capability of the On-demand & On-Access Scanner.

If possible the Supplier should demonstrate the detection ,disinfection or removal on the workstation and server.

Testing is to be carried out on both On-demand and on-access Scanners.

(On demand scanning) detection & disinfection

Task

T1.2.2:The product shall detect and disinfect or move infected file to a secure location for all of the Virus types indicated, when a virus checker is specifically launched to detect viruses.

Instructions

Demonstrate how your product can detect and disinfect each of the following virus types:

Boot Sector Viruses
File Viruses
Executables
Macro Viruses
Stealth viruses

For *workstations* Insert infected diskette containing virus type (i.e. macro) into the PCs and launch the anti-virus software scanner.

For *servers* save the infected diskette from the PC onto the server then launch the sever scanner.

Check

1.2.2a:The product shall detect a Virus Type (i.e. bootsector) virus on the system successfully.
1-2-3-4-5-6-7

1.2.2b:The product shall displays results of the detection of the virus.
1-2-3-4-5-6-7

1.2.2c:The product shall display the name of the virus clearly to the user.
1-2-3-4-5-6-7

1.2.2d:After disinfecting the document is in tact and when opened, is in its correct/original form.

1-2-3-4-5-6-7

1.2.2e:The product shall successfully disinfect the Virus Type.

1-2-3-4-5-6-7

(On-Access Scanning/automatic scanning) detection & disinfection

Automatic detection on workstations. This feature needs to be considered as many Antivirus products are not very strong in this area, also the user will not always remember to scan disks before using them. Therefore it is important to have such a feature.

Task

T1.2.3:The product shall be able to automatically detect and disinfect viruses.

Instructions

Demonstrate how your product can automatically detect each of the following virus types :

Boot Sector Viruses

File Viruses

Executables

Macro Viruses

Stealth viruses

Open an infected file either from an infected diskette provided or from an infected file on the computer.

Checks

1.2.3a:The product shall automatically detect the file as being infected with a virus .

1-2-3-4-5-6-7

1.2.3b:The product shall display name of the virus.

1-2-3-4-5-6-7

1.2.3c:The product shall have a feature to prompt the user with a message, to ask the user whether they wish to disinfect the file.

1-2-3-4-5-6-7

1.2.3d:The product shall have a feature to allow to the user to automatically disinfect the infected file after being detected.

1-2-3-4-5-6-7

1.2.3e:The product shall be able to disinfect the file successfully.

1-2-3-4-5-6-7

If the file is a Word, excel or similar document then apply the next check :

1.2.3f:The infected file shall be successfully opened again after disinfection.
1-2-3-4-5-6-7

1.2.3g:After automatic disinfection the document is in tact and when opened is in its correct form.
1-2-3-4-5-6-7

T1.3 LOG

This part of the section explores requirements in relation to the log .

Task

T1.3: The product shall keep a log of all the viruses that it has detected.

Instructions

Demonstrate how the product shall keep a log of the viruses it has detected.

Checks

1.3a: The product shall maintain all the viruses it detects on the system.(Workstation/server)
1-2-3-4-5-6-7

1.3b: The products log shall display details of the virus type.

The log details include

Name of virus detected

Date/time of detection

Action taken

Location of file

OTHERS_____

1-2-3-4-5-6-7

1.3c: The products Log shall be easy to use and read.
1-2-3-4-5-6-7

1.3d: The product shall have a feature for the removal of specific entries within the log.
1-2-3-4-5-6-7

1.3e: The product shall allow for configuration of the log.
1-2-3-4-5-6-7

1.3f: The product shall have a feature to clear all entries within the log.
1-2-3-4-5-6-7

T1.4 Alert Feature

This section shall explore the requirements of the alert feature in the product.

Task

T1.4: The product shall provide an alert feature to broadcast to relevant personnel(IT staff) that a virus has been found.

Instruction

Demonstrate how your product shall alert User/ System administrator when a file is found to be infected with virus on a server and a workstation.

Check

1.4a: The product shall after detection send an alert message to appropriate individual.

1-2-3-4-5-6-7

1.4b: The product shall have a feature for the configuration of the alert messages.

1-2-3-4-5-6-7

1.4c: The alert messages can be configured for groups/users and specific IT individuals.

1-2-3-4-5-6-7

1.4d: Alert messages can be sent via a pager.

1-2-3-4-5-6-7

1.4e: Alert messages can be sent via a email.

1-2-3-4-5-6-7

1.4f: Alert messages can be sent via a fax .

1-2-3-4-5-6-7

Operating systems(OS) and Network Operating Systems (NOS) Compatibility

This first acceptance test section shall explore how well the product is compatible with the different operating systems(OS) and Network Operating Systems (NOS) that are in use in the bank.

Task

T1.5: The Product shall be compatible with and able to function on the operating systems indicated by the vendor.

Instructions

Demonstrate the operation of the anti-virus software product on each of the Operating Systems (OS)and Network Operating Systems(NOS) the vendor has indicated product compliance to. The product should already be installed on the PC or Server. The demonstrator should if possible on the N/OS;

- open a number of other programs/applications other than the suppliers product on the Computer system
(e.g. . On a Workstation operating Windows 95 OPEN MS Word 6.0 and MS DOS.On the Server OPEN a backup program)

- conduct general operations related to your product such as scanning, setting of the schedule.
- scan the hard drive of the system

For the following checks enter the name of the appropriate OS or NOS in the space provided. All Checks are the same for all OS and NOS.

OS or NOS _____

Checks

1.5a: The product shall be installed and operating on _____
1-2-3-4-5-6-7

1.5b: The product shall be able to scan the Workstation/Server successfully.
1-2-3-4-5-6-7

1.5c: The user can switch to a different screens (Windows or Console) without any problem or errors and generally move around the N/OS.
1-2-3-4-5-6-7

1.5d: The User Interface of the product can be seen to be in its correct form.
1-2-3-4-5-6-7

1.5e: The product shall be shown to successfully operate when other applications and programs are open as well.
1-2-3-4-5-6-7

1.5f: The product shall open without any errors (Messages)
1-2-3-4-5-6-7

1.5g: The product shall be closed without any system errors. (Messages)
1-2-3-4-5-6-7

1.5h: The product shall not hang at any time during its operations.
1-2-3-4-5-6-7

1.5i: Programs operating or open in the background shall not hang or crash when the product is open or in operation (i.e. scanning for viruses).
1-2-3-4-5-6-7

1.5j: Other Programs shall be operating in the background with the product being open as well.
1-2-3-4-5-6-7

Acceptance Test 2

Groupware Compliance Task-2 (T2)

This acceptance test explores how well the supplier's product meets the requirements related to Groupware products.

The two main Groupware products in use by the bank shall be tested only. The products are as follows

1. Lotus Notes
2. Microsoft(MS) Exchange

T2.1 Lotus Notes

Task

T2.1: The product shall scan, detect and prevent viruses on Lotus Notes

Instruction

Demonstrate how the product can scan , detect and prevent viruses on Lotus Notes.

Checks

2.1a: The product shall scan, detect and prevent viruses on Lotus Notes.
1-2-3-4-5-6-7

2.1b: The product shall scan notes Mail and notes Database attachments for viruses.
1-2-3-4-5-6-7

2.1c: The product shall scan every Mail item as it is received by the User. (Incoming Mail)
1-2-3-4-5-6-7

2.1d: Incoming mail to client if infected with a virus shall be automatically disinfected or moved to a secure location.
1-2-3-4-5-6-7

2.1e: The product shall scan every mail item as it is sent by a User (Outgoing Mail) and infected mail sent by a user shall be automatically disinfected.
1-2-3-4-5-6-7

2.1f: The Product shall scan encrypted attachments.
1-2-3-4-5-6-7

T2.2 MS Exchange

Task

T2.2: The product shall scan, detect and prevent viruses on MS Exchange.

Instructions

Demonstrate how the product can scan and detect viruses on MS Exchange.

Checks

2.2a: The product shall scan each email message and attachment both on the Exchange server and Client Machines.

1-2-3-4-5-6-7

2.2b: The product shall disinfect or remove the infected file to a secure location.

1-2-3-4-5-6-7

2.2c: The product shall have a feature for background scanning. It shall check New and existing files on exchange folders continuously in the background.

1-2-3-4-5-6-7

2.2d: The product can scan each time a file is accessed, copied or implicated.

1-2-3-4-5-6-7

2.2e: The product shall have a feature for schedule scanning of the exchange store on exchange server/workstation.

1-2-3-4-5-6-7

2.2f: The product shall scan every Mail item as it is received by the User. (Incoming Mail) and if infected with a virus shall be automatically disinfect or move to a secure location.

1-2-3-4-5-6-7

2.2g: Outgoing Infected mail sent by a user shall be automatically disinfect or moved to a secure location.

1-2-3-4-5-6-7

2.2h: Infected mail (On the Users Workstation or the Sever) shall be automatically disinfect or removed to a secure location.

1-2-3-4-5-6-7

2.2i: The Product shall scan encrypted attachments in MS Exchange

1-2-3-4-5-6-7

2.2j: The product scans the Post Office for messages that await processing.

1-2-3-4-5-6-7

Acceptance Test 3

EMAIL (Internet email) Task-3 (T3)

This acceptance test shall explore how well the supplier's product meets email SMTP(Supplier Mail Transfer Protocol) requirements. The email sent from one client mail system to another across the Internet (Internet Mail)

Task-3 (T3)

T3.1: The product shall *scan* and *monitor* incoming and outgoing email attachments for viruses.

Instructions

Demonstrate how your product shall scan incoming and outgoing email (Attachments) for viruses.

Example- To test incoming and outgoing infected email the Vendor composes an email and attaches an infected attachment to the message, such as a Macro virus . The email is then sent to host.

Checks

3.1a: The product shall scan email attachments before they become items in the users Inbox.

1-2-3-4-5-6-7

3.1b: The product shall scan for outgoing messages.

1-2-3-4-5-6-7

3.1c: The product shall monitor incoming and outgoing emails in the background on both client and server systems.

1-2-3-4-5-6-7

3.1d: The scanning of incoming and outgoing emails is straight forward and simple to setup.

1-2-3-4-5-6-7

3.1e: The product shall be able to scan emails with compressed attachments.

1-2-3-4-5-6-7

T3.2: The product shall *detect* and *disinfect* incoming and outgoing viruses.

Instruction

Demonstrate how your product detects and disinfects or moves email to a secure location if infected.

Example- To test for detection and disinfection the vendor may compose an email and infect an attachment to the message, such as a Macro virus . The email is then sent to host.

Checks

3.2a: The product shall successfully detect an infected incoming email before it becomes an item in the users box.

1-2-3-4-5-6-7

3.2b: The product shall successfully detect an infected outgoing email.

1-2-3-4-5-6-7

3.2c: Once an infected email is detected the product shall alert the user of the system and the system administrator.(or other groups or individuals if required)

1-2-3-4-5-6-7

3.2d: The product shall give details of the virus found.

1-2-3-4-5-6-7

3.2e: The product shall provide a feature where it shall automatically disinfect an incoming or outgoing infected email message.

1-2-3-4-5-6-7

3.2f: The product shall provide a feature where if it is unable to automatically disinfect an infected email is instead able to move it to a secure location. (Quarantine)

1-2-3-4-5-6-7

3.2g: The product shall provide a feature to disable the automatic disinfect or removal of an infected file . i.e. system administrator may wish to take charge of what to do with a virus on a file himself.

1-2-3-4-5-6-7

3.2h: The product shall keep a log of all emails which have been found to be infected with a virus.(so that one is able to determine were it came from)

1-2-3-4-5-6-7

Acceptance Test 4

Internet (Internet borne virus detection / Internet Update Web site)

This section determines how well the suppliers product meets Anti-virus Software requirements related to the Internet.

Task-4 (T4)

T4.1: The product shall monitor, detect disinfect and prevent Internet borne viruses.

Instructions

Please demonstrate how your product monitors detects disinfects and prevents Internet borne viruses.

The supplier should Download a file infected with a virus off the Internet.

Checks

4.1a: The product shall prevent an Internet borne virus before it gets into the Organisations Internal Network.

1-2-3-4-5-6-7

4.1b: The product shall detect the file being downloaded as containing a virus.

This section shall explore how well the suppliers product is documented.

Task-5 (T5)

T5.1: The supplier shall provide provides documentation.

Instruction

Demonstrate your products documentation

Checks

5.1a: Documentation is provided for all the platforms, Operating systems, Groupware products, email that the product supports.

1-2-3-4-5-6-7

5.1b: The documentation is clear and easy to interpret for IT professional.

1-2-3-4-5-6-7

5.1c: The documentation is clear and easy to interpret for a novice user.

1-2-3-4-5-6-7

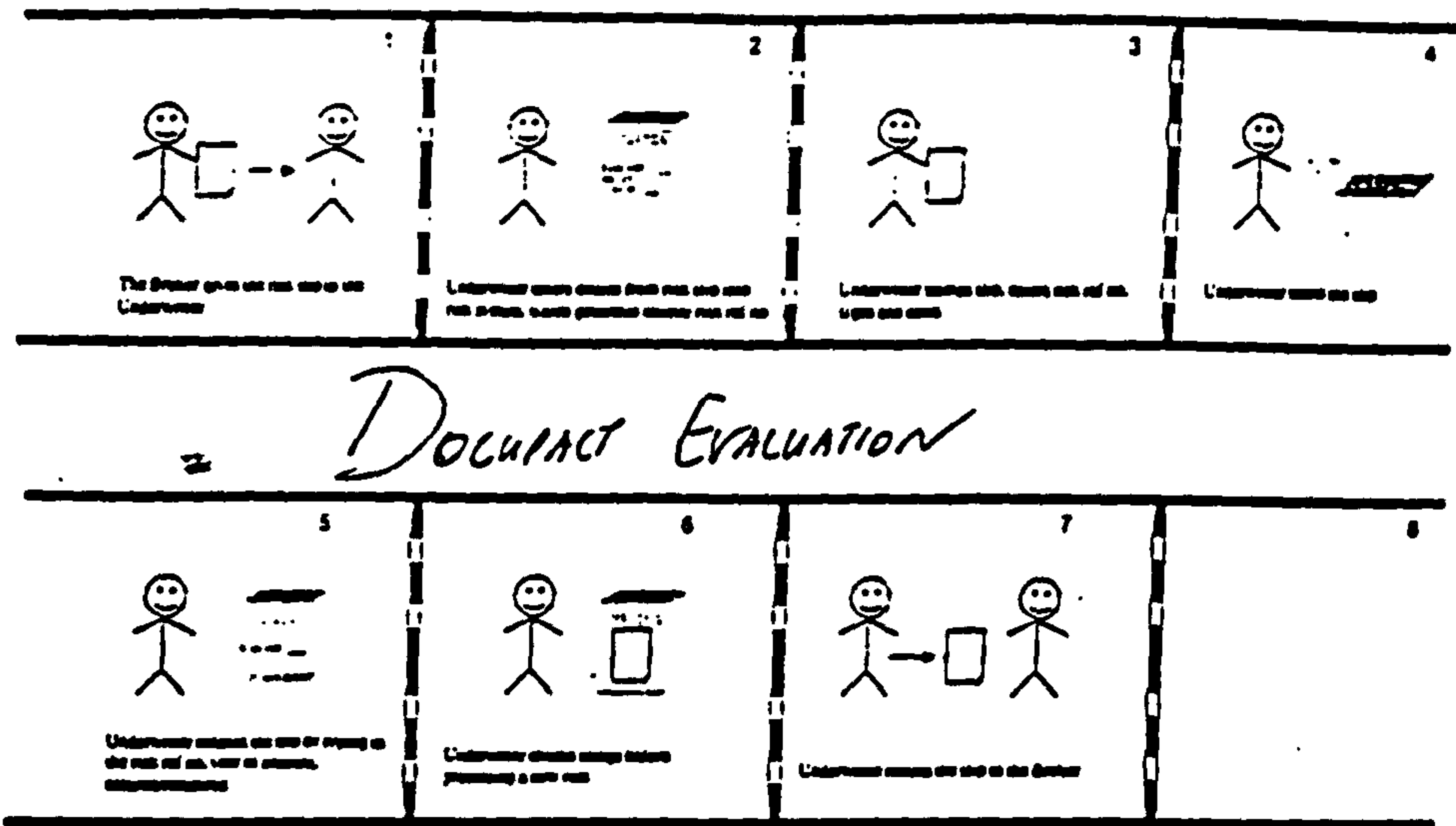
5.1d: The documentation is relevant.

1-2-3-4-5-6-7

5.1e: The documentation provides clear instructions for installation of the product on all the platforms and operating systems it supports.

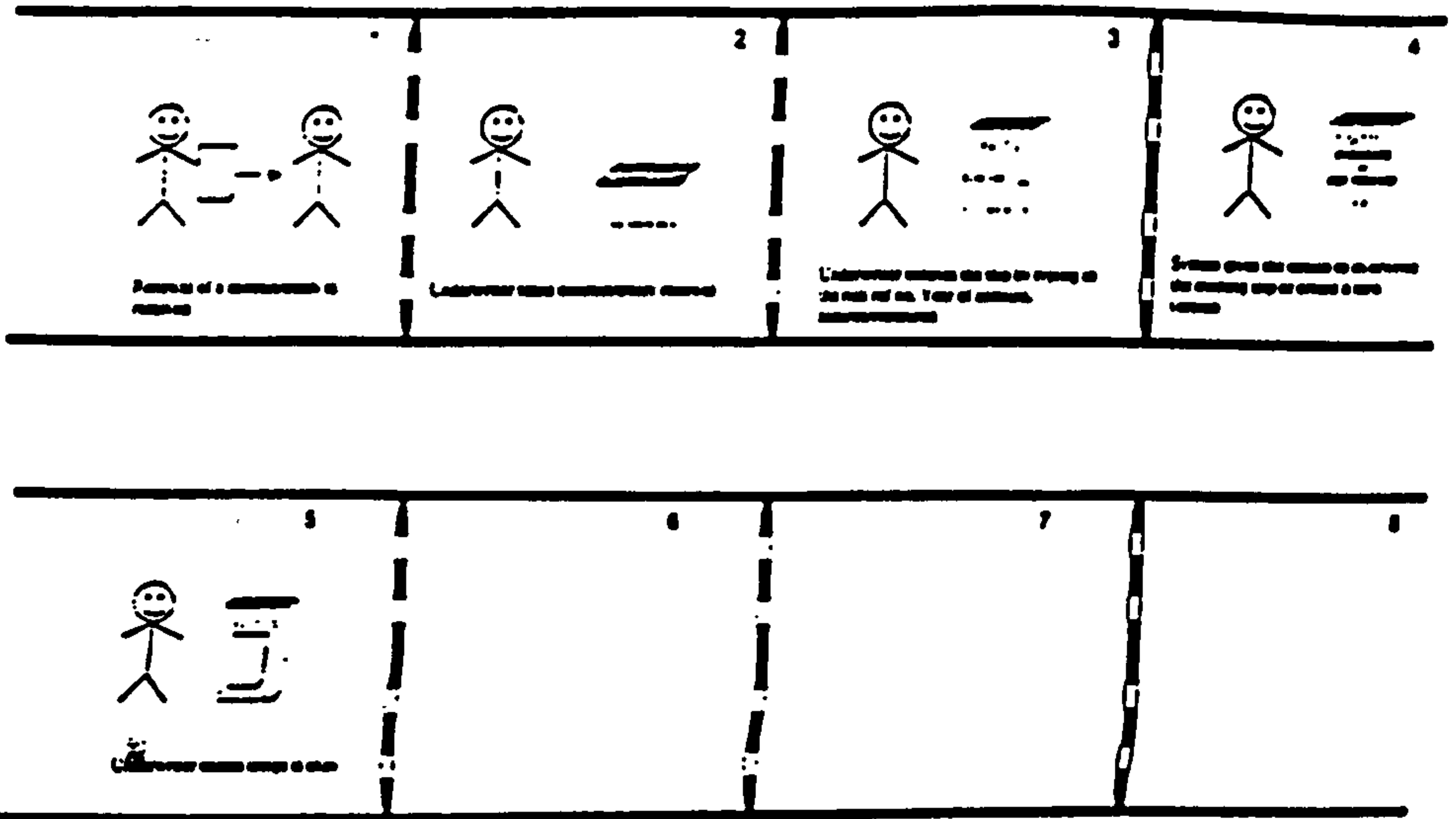
1-2-3-4-5-6-7

Appendix 6e: Sample of acceptance test cases used in Organisation C



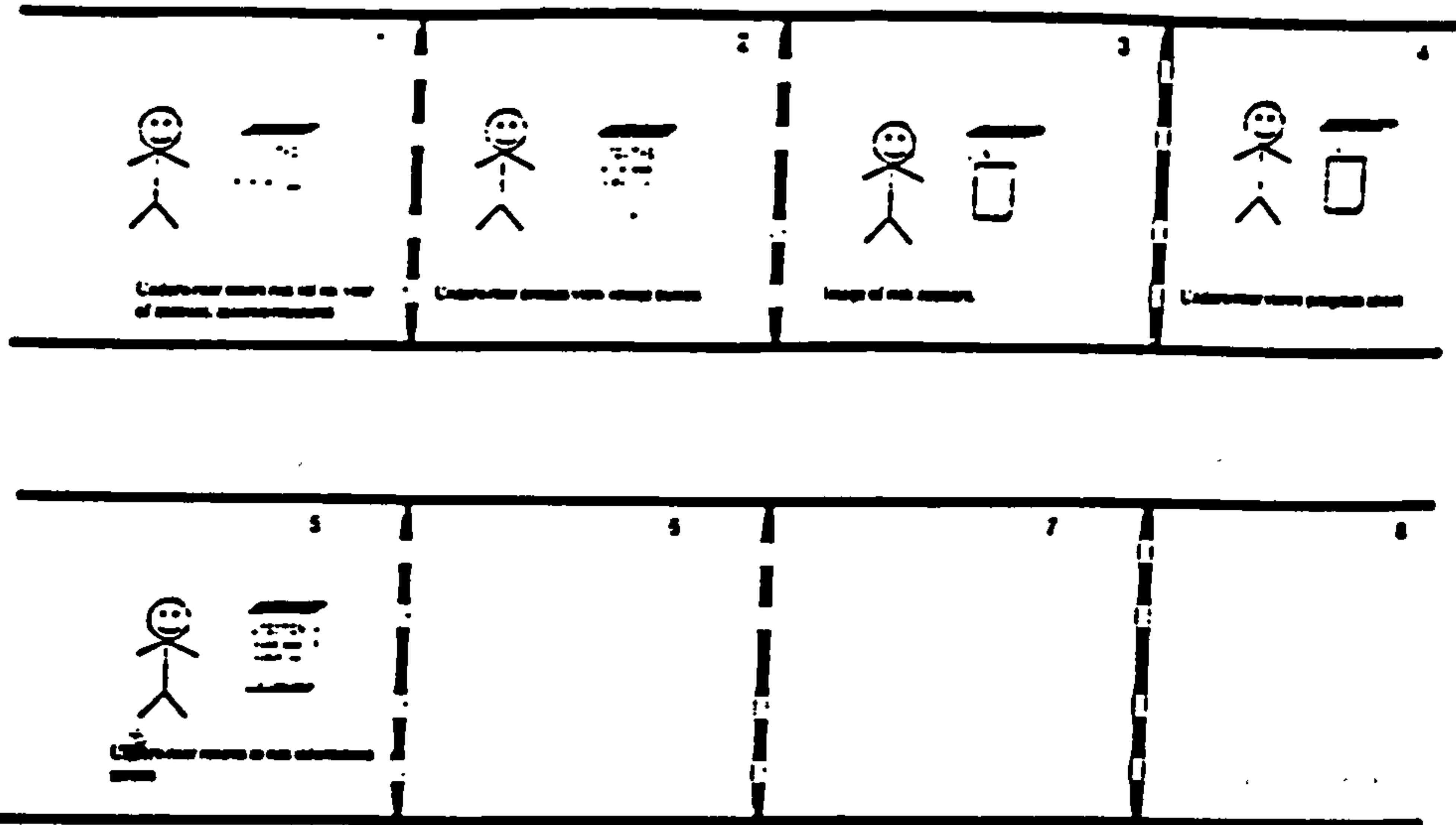
1. UNDERWRITER SCANS NEW RISK

R29.1	The system shall index a risk slip by risk reference number, year of account, and assured/reassured.	Y/N	0- 1- 2- 3- 4- 5	Not prepared
R32.9.1	The system shall ask the user what type of document has been scanned before saving the image e.g. Treaty, Slip, Contract	Y/N	0- 1- 2- 3- 4- 5	The user can do this A separate can tell the system what type it is.
R32.9.2	The system shall store the image in the correct directory depending on the response from the user in 32.9.1	Y/N	0- 1- 2- 3- 4- 5	
R33.11	The system shall take a fully trained user a maximum of 60 seconds to scan and index a 5 page slip	Y/N	0- 1- 2- 3- 4- 5	20 12:00 12:50 45 seconds
R17.9	The system shall force the user to check that an image has scanned properly before allowing them to process a new risk	Y/N	0- 1- 2- 3- 4- 5	Some images are they scanned but doesn't force user to check
R26.9	The system shall not allow the user to alter/annotate a risk slip in any way	Y/N	0- 1- 2- 3- 4- 5	Delimited by viewing access rights
R31.9	The system shall allow the user to attach new pages to an existing imaged document	Y/N	0- 1- 2- 3- 4- 5	Not tested as single risk.



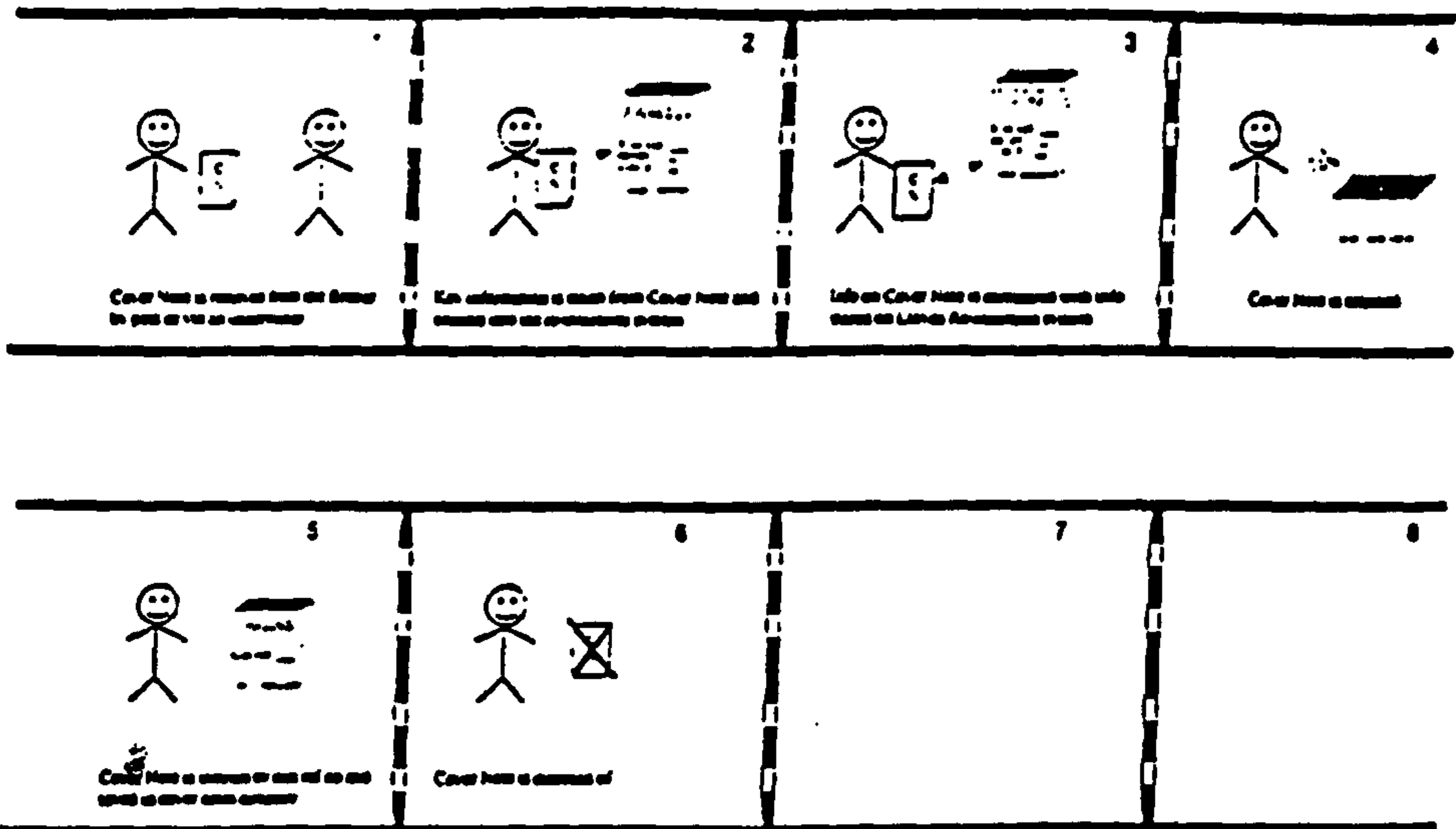
2. UNDERWRITER UPDATES CONTRACT/TREATY

<p>RS.1</p>	<p>The system shall allow the user to overwrite a risk slip if a risk slip with the same risk reference number exists</p>	<p>Y/N</p>	<p>0- ① 2- 3- 5</p>	<p>Need to be why in main screen Relies on user input - Select Ok Yes or No</p>
<p>RS.2</p>	<p>The system shall allow the user to save a new version of the risk slip if a risk slip with the same risk reference number exists</p>	<p>Y/N</p>	<p>0- 1- ② 3- 5</p>	<p>Why around it like above</p>
<p>RS.3</p>	<p>The system shall store up to 5 versions of an image for a single active risk and these versions must be identified together</p>	<p>Y/N</p>	<p>0- 1- 2- 3- ⑤</p>	
<p>RS.4</p>	<p>The system shall automatically archive risks that are more than 5 years old</p>	<p>Y/N</p>	<p>0- 1- 2- ③ 5</p>	<p>Cloned by manager</p>



3. UNDERWRITER VIEWS RISK

R2.9.2	The system shall display the correct risk slip when its risk reference number, year of account, assured/reassured name are searched for	Y/N	0- 1- 2- 3- 4- 5	Yes at all not denied No " "
R2.9.12	The system shall recall an image within 10 seconds	Y/N	0- 1- 2- 3- 4- 5	5 seconds
R2.9.9	The system shall enable a user to view clearly all the text of a single page of a document on a maximised window	Y/N	0- 1- 2- 3- 4- 5	No full screen option on window or full had to remove taskbar
R2.9.2	The system shall display a tab/shortcut to show if any program sheets are linked to the risk slip	Y/N	0- 1- 2- 3- 4- 5	Does it through search and displays file list
R2.9.3	The system shall display the program sheet that matches the risk reference number entered in 3.9.2	Y/N	0- 1- 2- 3- 4- 5	

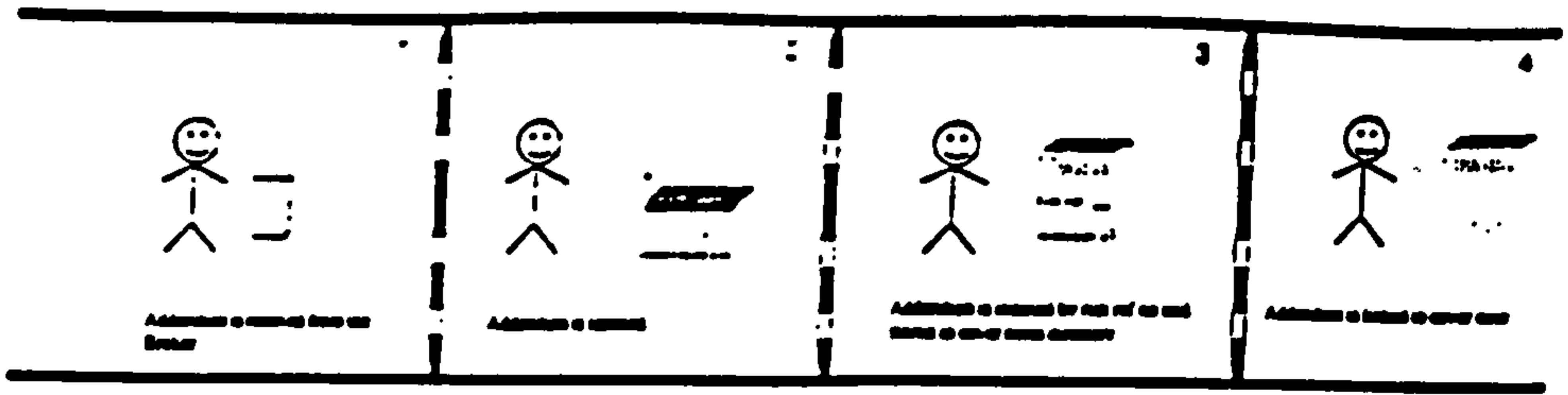


4. COVER NOTE IS RECEIVED

R19.9	The system shall allow a 14 digit reference number for indexing	Y/N	0- 1- 2- 3- 5	
R19.2	The system shall give the user the option to index the Cover Note by either cover note ref No or risk ref No	Y/N	0- 1- 2- 3- 5	Needs 1 & 2 Set by Dialog
R19.11	The system shall take a fully trained user a maximum of 40 seconds to scan and index a 5 page cover note	Y/N	0- 1- 2- 3- 5	To check to scan See A 33.11

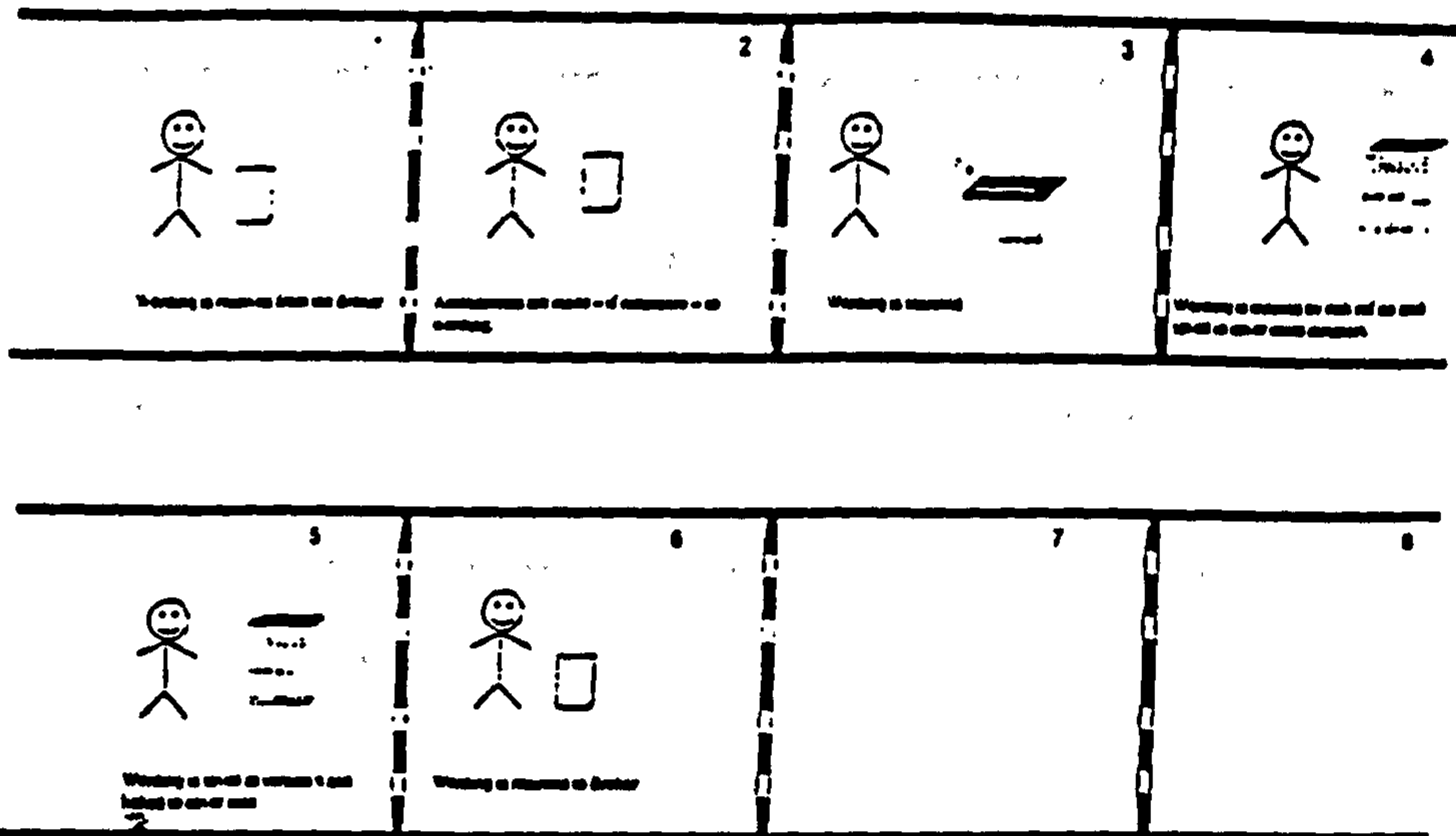
5. COVER NOTE IS VIEWED

R19.1	The system shall display the correct Cover Note when its cover note ref No/ risk ref No is entered	Y/N	0- 1- 2- 3- 5	
R19.2	The system shall display any linked addenda upon entering the cover note ref no.	Y/N	0- 1- 2- 3- 5	Similar to program check
R19.1	The system shall display any linked wording documents upon entering the cover note ref no.	Y/N	0- 1- 2- 3- 5	



6. ADDENDUM IS RECEIVED

R16.1	The system shall enable the user to index the addendum by cover noterrisk referene number	Y/N	0- 1- ② 3- 5	Needs further
R16.2	The system shall prefix the Addendum reference number with A by default	Y/N	0- 1- ② 3- 5	Needs further Does it differently

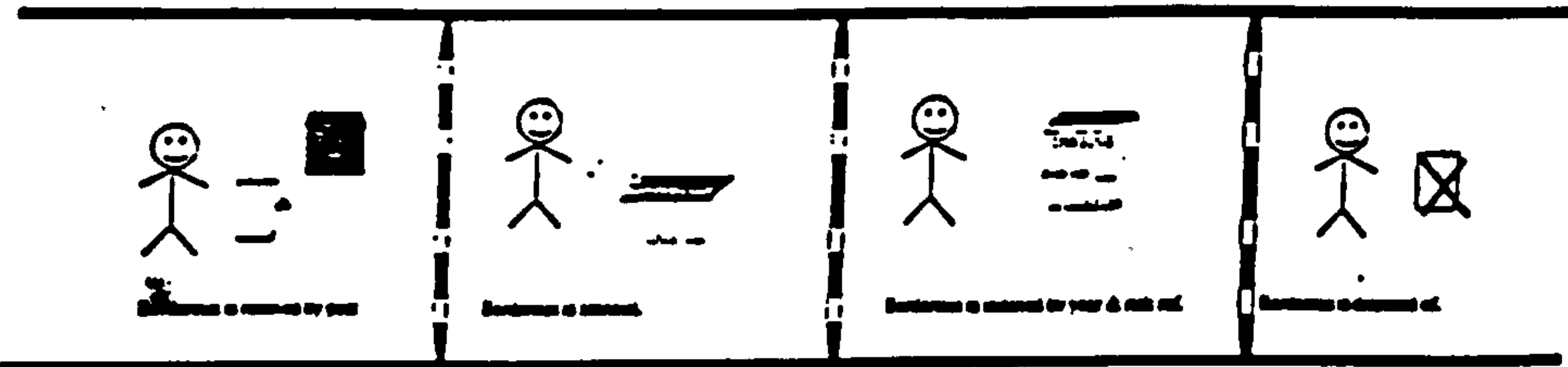
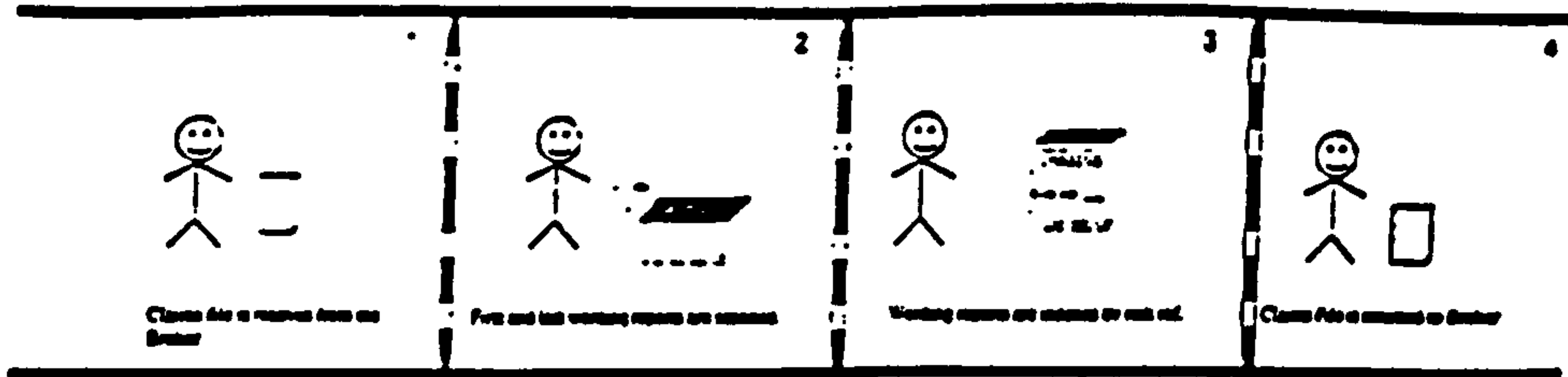


7. WORDING IS RECEIVED

R6.9.1	The system shall enable the user to index the wording by cover note/risk reference number	Y/N	0- 1- 2- 3- 4- 5	Need indexing
R6.9.2	The system prefix the wording reference number with W by default	Y/N	0- 1- 2- 3- 4- 5	Set up default type instead of having W in index field
R7.9.1	The system shall enable the storing of the latest 6 versions of a single wording document.	Y/N	0- 1- 2- 3- 4- 5	Several hundred versions stored but what if user wants to find it
R7.9.2	The system shall enable the user to delete earlier versions of the wording should the limit on the number of versions be exceeded.	Y/N	0- 1- 2- 3- 4- 5	N/A

8. WORDING IS VIEWED

R10.9	The system shall automatically display the most recent version of a wording when the document is retrieved by a user	Y/N	0- 1- 2- 3- 4- 5	Use pin facility to look at older version
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9. CLAIMS FILE IS RECEIVED

R113	The system shall allow the user to index Wording Documents by risk ref No, date of loss	Y/N	0- 1- 2- 3- 5	Needs Training
R113	The system shall allow the user to attach notes to a Wording Document by way of an attached memo field on the index input screen	Y/N	0- 1- 2- 3- 5	Can we fill text pattern matching without need for memo?
R113	The system shall display the correct Wording Document when its risk reference number is entered	Y/N	0- 1- 2- 3- 5	

10. BORDEREUX IS RECEIVED

R113	The system shall enable 36 versions of a Bordereux to be stored	Y/N	0- 1- 2- 3- 5	
R113	The system shall display the correct Bordereux when its year and risk reference number are entered	Y/N	0- 1- 2- 3- 5	

1. USABILITY

R22.11	The system shall enable a user to locate a document/image within 60 seconds for 90% of searches	Y/N	0- 1- 2- 3- 4- 5	Image Store on Cash - Took 15 Seconds Difficult / took with few docs in the system
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2. SECURITY

R24.1A1	The system shall allow passwords to be applied to directories	Y/N	0- 1- 2- 3- 5	
R24.1A2	The system shall allow passwords to be applied to individual files	Y/N	0- 1- 2- 3- 5	
R27.1A1	The system shall allow user profile access rights to be applied to directories	Y/N	0- 1- 2- 3- 4	
R27.1A2	The system shall allow user profile access rights to be applied to individual files	Y/N	0- 1- 2- 3- 4	

Appendix 6f: Stakeholder responses to questionnaire

What is your opinion of the approach I have taken in helping to find the most suitable document management software?

BECAUSE OF THE SECTORISED BASIS OF THE COMPANIES REQUIREMENTS (IE UNDERSTANDING REQUIREMENTS CLAIMS ADMIN) AS SEPARATE DEPARTMENTS I FELT THAT THE OUTCOME WOULD HAVE BEEN MORE OF LESS THE SAME WITH OR WITHOUT USE OF THE METHOD EMPLOYED.

re the initial interviews effective in helping you to think about your requirements for the new software? YES - How did they help? Not at all Quite helpful Very effective

AS ABOVE THE INDIVIDUALS ASKED ALREADY KNEW THEIR OWN REQUIREMENTS BUT THE OVERALL EFFECT WAS SATISFACTORY. BREAKING DOWN THE REQUIREMENTS IN THIS WAY THE THOUGHT PROCESS WAS KICKED OFF WELL.

How effective were the storyboards (diagrams with stickmen) in helping you consider additional requirements? YES - How did they help? Not at all Quite helpful Very effective

THE STORYBOARDS WHICH WERE INDIVIDUAL WERE COLLECTED TOGETHER TO GIVE AN OVERALL PICTURE OF THE SYNDICATES BUSINESS THIS WOULD HAVE BEEN MORE EFFECTIVE.

Were the supplier demonstrations: i) Confusing Quite helpful Informative
ii) Too short About Right
iii) Chaotic Could be better Well structured

How involved did you feel in the software selection process as a result of the interviews and supplier demonstrations? $1/4$ More involved Very involved

Has the process changed your attitude towards the proposed document management system? In mind of things

YES IN SO FAR AS IT SEEMS THAT THE INITIAL SETTING UP MAY BE MORE TIME CONSUMING THAN AT FIRST THOUGHT BUT THAT ONCE WORKING THE DAY TO DAY RUNNING SHOULD BE SIMILAR TO THAT EXPECTED.

Could you go through the same process again? YES ASSUMING A SMALLER TIMESCALE.

Any other comments

THE BOOKING OF DEMOS SHOULD BE MADE BEFORE ENTERING THE REQUIREMENTS PROCESS... SO THAT THEY ARE ALL WITHIN ONE WEEK... AS NOT TO FORGET THE OTHER DEMONSTRATIONAL SYSTEMS.

1. What is your opinion of the approach I have taken in helping to find the most suitable document management software?

VERY GOOD, HEARD OS TO UNDERSTAND THE PRODUCT & WHY IT CAN DO.....

2. Were the initial interviews effective in helping you to think about your requirements for the new software? Not at all Quite helpful Very effective

IF YES - How did they help?

YEAR EFFECTIVE. HELPED US TO THINK FORWARD ABOUT HOW WE COULD USE THE SOFTWARE TO ITS MAXIMUM POTENTIAL.....

3. How effective were the storyboards (diagrams with stickmen) in helping you consider additional requirements? Not at all Quite helpful Very effective

IF YES - How did they help?

NOT AT ALL.....

4. Were the supplier demonstrations:

- a) Confusing or Quite helpful or Informative ✓
- b) Too short or Too long ✓ or About Right
- c) Chaotic or Could be better ✓ or Well structured

5. Do you now feel more involved in the software selection process as a result of the interviews and supplier demonstrations? Y/N YES.

6. Do you now feel more inclined to accept the proposed document management system?

YES. FEATURES AVAILABLE ARE A LOT.....

BETTER THAN ORIGINAL EXPECTED.....

7. Would you go through the same process again? Y/N YES.

8. Any other comments

GAVE ME MORE AWARENESS OF CAPABILITIES OF THE PRODUCT.....

1. What is your opinion of the approach I have taken in helping to find the most suitable document management software?

*Reply: ... my opinion: assurance of software
Lower success than evaluation is for some low or a good software answer*

2. Were the initial interviews effective in helping you to think about your requirements for the new software?
IF YES - How did they help? *N/A*

.....

3. How effective were the storyboards (diagrams with stickmen) in helping you consider additional requirements?
IF YES - How did they help? *N/A*

.....

4. Were the supplier demonstrations:
a) Confusing or Quite helpful or Informative
b) Too short or Too long or About right
c) Chaotic or Could be better or Well structured

5. Do you now feel more involved in the software selection process as a result of the interviews and supplier demonstrations? *Y/N* *N/A*

.....

6. Do you now feel more inclined to accept the proposed document management system? *Yes*

.....

7. Would you go through the same process again? *Y/N* *Review shown in scale*

.....

8. Any other comments
Evaluation given time to do too information for suppliers

1. What is your opinion of the approach I have taken in helping to find the most suitable document management software?

..... *Fine - Although I do think that it is more important for our staff to ask questions during demonstrations*

2. Were the initial interviews effective in helping you to think about your requirements for the new software? Not at all Quite helpful Very effective

..... *If YES - How did they help? We thought of a couple of things that might not have been considered otherwise*

3. How effective were the storyboards (diagrams with stickmen) in helping you consider additional requirements? Not at all Quite helpful Very effective

..... *If YES - How did they help? As above, different scenarios etc and they made me laugh!!*

4. Were the supplier demonstrations: a) Confusing or Quite helpful or Informative

b) Too short or Too long or About Right

c) Chaotic or Could be better or Well structured

5. Do you now feel more involved in the software selection process as a result of the interviews and supplier demonstrations? Y N

.....
.....

6. Do you now feel more inclined to accept the proposed document management system? Y N

.....
.....

7. Would you go through the same process again? Y N

.....
.....

8. Any other comments *Asking questions that upset the suppliers during demonstrations is not productive*

1. What is your opinion of the approach I have taken in helping to find the most suitable document management software?

Answered.....a. *Approach*.....with.....*party*.....of.....*optimization*.....for.....*Don't*.....*check*.....*his*.....*understanding*.....of.....*ways*.....*needs*.....

2. Were the initial interviews effective in helping you to think about your requirements for the new software?

IF YES - How did they help? *Answered*.....*Yes*.....*was*.....*lower*.....*understanding*.....of.....*the*.....*requirements*.....
.....
.....
.....
.....
.....

Not at all **Quite helpful** Very effective

3. How effective were the storyboards (diagrams with stickmen) in helping you consider additional requirements?
IF YES - How did they help? *Answered*.....*very*.....*of*.....*seeing*.....*that*.....*prepared*.....*system*.....*would*.....*not*.....*ways*.....*needs*.....

a) Confusing or Quite helpful or Informative
b) Too short or Too long or About Right
c) Chaotic or Could be better or Well structured

N/A

4. Were the supplier demonstrations: **N/A**

5. Do you now feel more involved in the software selection process as a result of the interviews and supplier demonstrations? **YN**

N/A.....*necessary*.....*more*.....*involved*.....*because*.....*was*.....*quite*.....*from*.....*the*.....*project*.....*trying*.....

6. Do you now feel more inclined to accept the proposed document management system? **YN**

7. Would you go through the same process again? **YN**

8. Any other comments *Quite*.....*a*.....*long*.....*period*.....*of*.....*five*.....*elapsed*.....*between*.....*start*.....*of*.....*project*.....*end*.....
.....*N/A*.....*100%*.....*over*.....*what*.....*is*.....*the*.....*project*.....*end*.....*product*.....*of*.....*what*.....*is*.....*deadline*.....*for*.....
completion.....

Appendix 6g: Expert Background Questionnaire

The purpose of this questionnaire is to elicit background experience. The information provided will not be treated confidentially and will not be used for any other purpose other than for the purposes of this evaluation study. Thank you in advance for your participation and interest. Please e-mail response to: C.Ncube@soi.city.ac.uk

Name	
Position and Role & Years	

Your Background

Area: Requirements Engineering (RE)	Please tick if relevant	Please Indicate	Comment
Requirements identification/acquisition		1-2-3-4-5	
Requirements modelling		1-2-3-4-5	
Requirements measurement		1-2-3-4-5	
Requirements weighting		1-2-3-4-5	
RE techniques and methods		1-2-3-4-5	
Number of years in RE			

Area: Product & Supplier evaluation	Please tick if relevant	Please Indicate	Comment
COTS software product identification		1-2-3-4-5	
COTS software product evaluation		1-2-3-4-5	
Supplier evaluation		1-2-3-4-5	
Experience in representing customer during software product evaluation		1-2-3-4-5	
COTS software product identification techniques		1-2-3-4-5	
Number of years in product evaluation			

Area: Project Tendering	Please tick if relevant	Please Indicate	Comment
Software procurement process		1-2-3-4-5	
Experience in tendering process		1-2-3-4-5	
Producing an Invitation To Tender (ITT)		1-2-3-4-5	
Bid Assessment & evaluation		1-2-3-4-5	
Contract negotiation and production		1-2-3-4-5	
Number of years in project tendering			

Area: Decision-Making Analysis	Please tick if relevant	Please Indicate	Comment
Decision-making in software product evaluation		1-2-3-4-5	
Decision-making techniques		1-2-3-4-5	
Decision-making tools		1-2-3-4-5	
Number of years in decision analysis			

**COTS = Commercial-Off-The-Shelf; Positive Scales: i.e. 5 = very experienced,
1= less experienced**

Appendix 6h: Main scenario used during expert evaluation

The Main Scenario:

You have been selected as a member of a team tasked with choosing your office's new e-mail system. The management has given the team all the necessary resources to enable the team to do a good job of evaluating the candidate e-mail products. The team has been given 8 weeks to recommend the preferred e-mail system, so this should be enough time to complete the task adequately. All the stakeholders are keen to participate in the project. Figures 1 & 2 below depict the process your team should follow. Figure 1 depicts the high level process while Figure 2 shows the detailed process depicted in Figure 1. Figure 2 also shows the templates that are integrated with the process to provide advice.

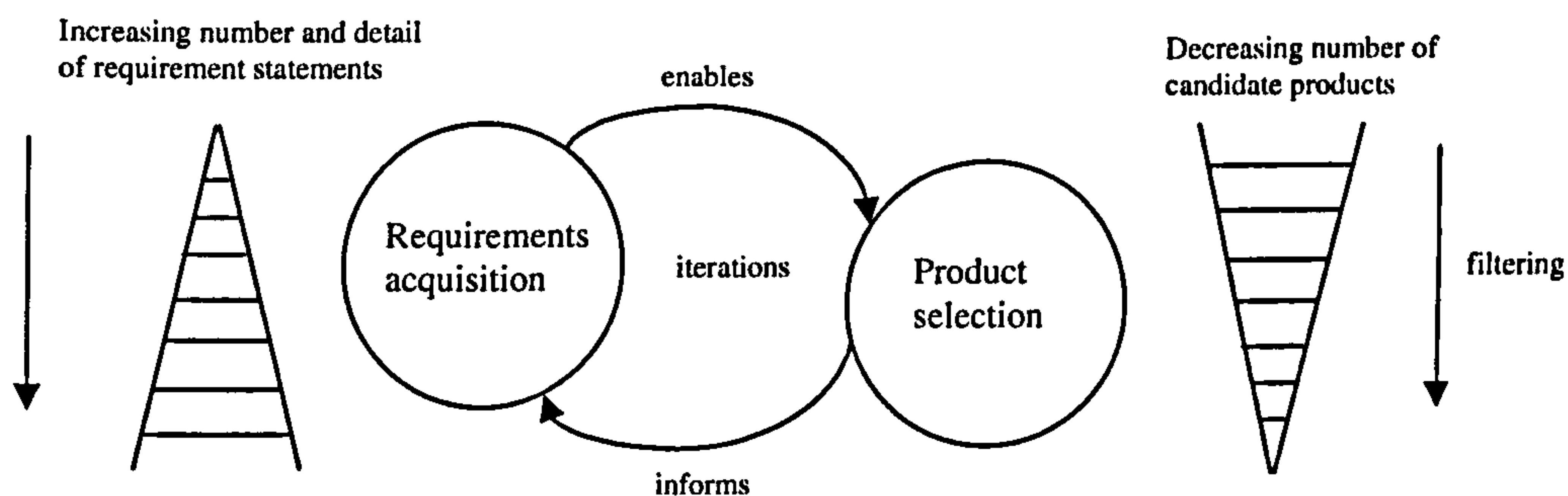


Figure 1: Overview of the PORE's iterative process. Requirements acquisition enables product selection and product selection informs requirements acquisition. As the number and detail of requirements increases, the number of candidate products decreases. The requirements acquisition and product selection processes are intertwined.

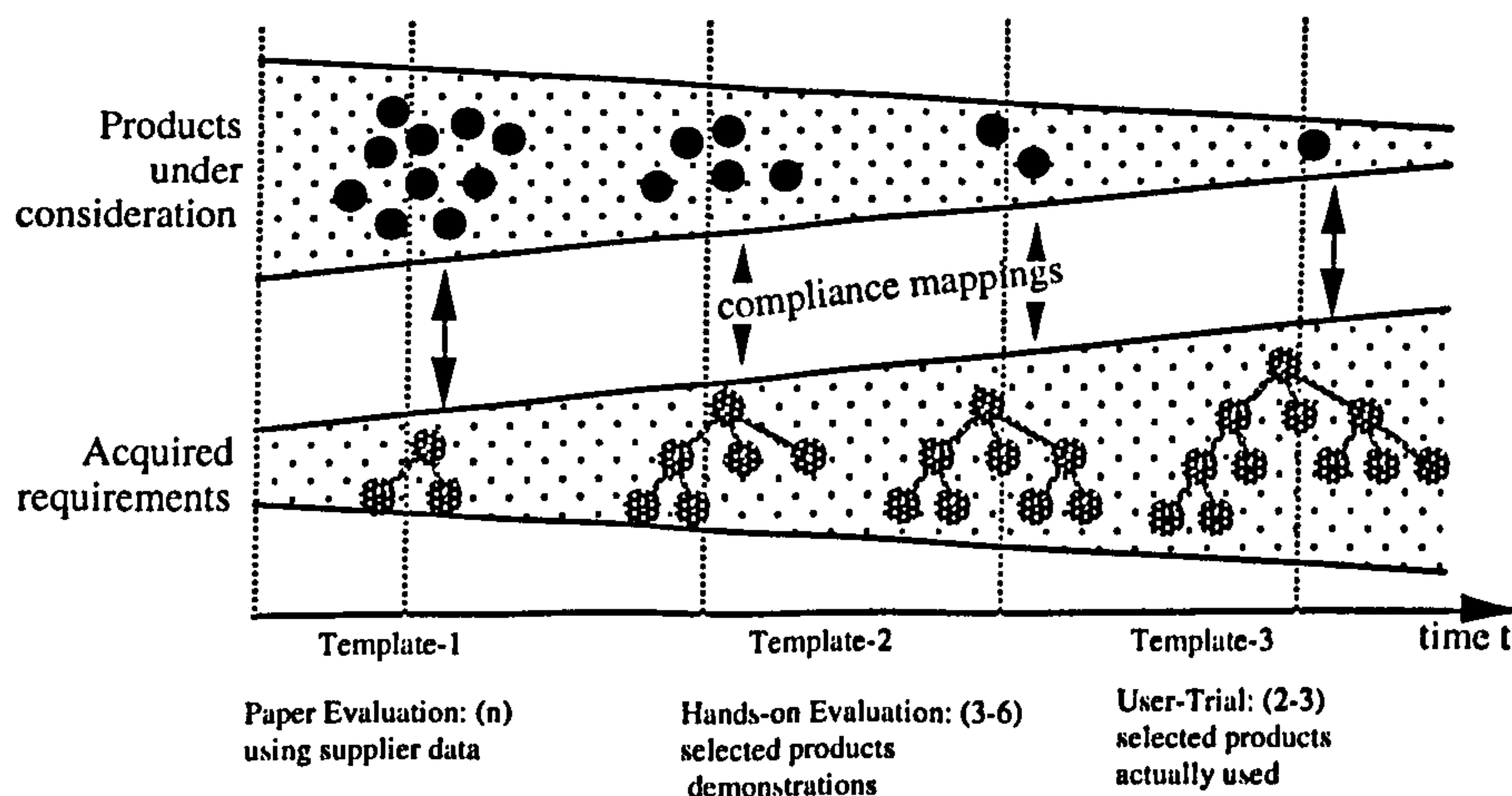


Figure 2: Overview of iterative process that integrates templates for process guidance. The figure shows that the number of acquired customer requirements increases while the number of

candidate software products reduces and therefore resulting in successive achievement of process goals.

At this stage the company has indicated that they need a new e-mail system. However, it has not yet been decided what the new system should be capable of doing. There are many stakeholders who have an interest in the new system. Different users are familiar with different e-mail products. However, the team has to select a product that will meet all the stakeholders needs following the process shown in Figure 1 & 2.

Situation-1: At the beginning of the process, the customer has expressed the need to purchase one or more off-the-shelf solutions. However, there are no requirements identified so far that the e-mail package should meet. Some stakeholders are familiar with some e-mail packages. So:

- what would be your next objective?
- what techniques would you use to reach this objective?

Situation-2: At this point in the process, you have not identified any candidate products that would meet customer office requirements. However, some stakeholders have suggested 3 possible e-mail products. Brochures that provide marketing information on these products are available. So:

- what would be your next objective?
- what techniques would you use to reach this objective?

Situation-3: You have now identified 30 candidate products in the market place. Access to these products and their suppliers is excellent. Furthermore, during the requirements acquisition process, over 45 requirements have been elicited. However, you do not have information about the products and their suppliers. So:

- what would be your next objective?
- what techniques would you use to reach this objective?

Situation-4: At this next stage in the process, you have identified that a large number of the 30 candidate products offer similar functionality to meet your office requirements. For example, all the e-mail packages meet the following requirements:

- The system shall send messages;

- The system shall receive messages;
- The system shall forward received messages;
- The system shall print messages;
- The system shall spell check outgoing messages;
- The system shall delete messages.

The problem is that these requirements do not help you to discriminate between the packages. So:

- what would be your next objective?
- what techniques would you use to reach this objective?

Situation-5: Because of time pressure, you are unable to examine in detail all of the 30 candidate products you have identified. How would you reduce the number to a manageable list and on what basis would you base your decision to remove the product from the list:

- what would be your next objective?
- what techniques would you use to reach this objective?

Situation-6: At this stage in the process, 6 candidate e-mail products have been shortlisted. The process which led to short-listing these products was trouble-free although some suppliers who were not shortlisted were not happy with their rejection. However, how would you conduct evaluation sessions as a basis for selecting a final preferred product(s) from the 6 shortlisted:

- what would be your next objective?
- what techniques would you use to reach this objective?

Situation-7: At this stage of the process, you have conducted the evaluation sessions of the 6 shortlisted products. How would you decide which products to reject from the final short-list and on what basis would select the final product(s):

- what would be your next objective?
- what techniques would you use to reach this objective?

Appendix 6i: Expert 1 Questionnaire Response

Situation-1: At the beginning of the process, the customer has expressed the need to purchase one or more off-the-shelf solutions. However, there are no requirements identified so far that the e-mail package should meet. Some stakeholders are familiar with some e-mail packages. So:

- what would be your next objective?
 - what techniques would you use to reach this objective?
-
- find out why they are doing the project in the first place and quantify it
 - use requirements meta-model
 - start with project blast off to help
 - look at the first eight items of the requirements template

Situation-2: At this point in the process, you have not identified any candidate products that would meet customer office requirements. However, some stakeholders have suggested 3 possible e-mail products. Brochures that provide marketing information on these products are available. So:

- what would be your next objective?
 - what techniques would you use to reach this objective?
-
- internet
 - trade papers
 - other organisations
 - market survey

Situation-3: You have now identified 30 candidate products in the market place. Access to these products and their suppliers is excellent. Furthermore, during the requirements acquisition process, over 45 requirements have been elicited. However, you do not have information about the products and their suppliers. So:

- what would be your next objective?
- what techniques would you use to reach this objective?

- what the web has told you
- download product summary
- send requests to the companies
- talk to other people
- send questionnaire

Situation-4: At this next stage in the process, you have identified that a large number of the 30 candidate products offer similar functionality to meet your office requirements. For example, all the e-mail packages meet the following requirements:

- The system shall send messages;
- The system shall receive messages;
- The system shall forward received messages;
- The system shall print messages;
- The system shall spell check outgoing messages;
- The system shall delete messages.

The problem is that these requirements do not help you to discriminate between the packages. So:

- what would be your next objective?
 - what techniques would you use to reach this objective?
- fit criteria
 - our idea of fit criteria

Situation-5: Because of time pressure, you are unable to examine in detail all of the 30 candidate products you have identified. How would you reduce the number to a manageable list and on what basis would you base your decision to remove the product from the list:

- what would be your next objective?
 - what techniques would you use to reach this objective?
- pick 10 key requirements and use them to eliminate the products

Situation-6: At this stage in the process, 6 candidate e-mail products have been shortlisted. The process which led to short-listing these products was trouble-free although some suppliers who were not shortlisted were not happy with their rejection. However, how would you conduct evaluation sessions as a basis for selecting a final preferred product(s) from the 6 shortlisted:

- what would be your next objective?
 - what techniques would you use to reach this objective?
-
- do the products satisfy the requirements equally?
 - Use ordering for short listing
 - Involve stakeholders

Situation-7: At this stage of the process, you have conducted the evaluation sessions of the 6 shortlisted products. How would you decide which products to reject from the final short-list and on what basis would select the final product(s):

- what would be your next objective?
 - what techniques would you use to reach this objective?
-
- use stake holders to priorities the products

Appendix 6j: Expert 2 Questionnaire Response

Situation-1: At the beginning of the process, the customer has expressed the need to purchase one or more off-the-shelf solutions. However, there are no requirements identified so far that the e-mail package should meet. Some stakeholders are familiar with some e-mail packages. So:

- what would be your next objective?
 - what techniques would you use to reach this objective?
-
- find out why would you need to purchase the system or product
 - identify the stakeholders
 - what capabilities you want in the package
 - identify high level requirements
 - think about high level IT architecture and infrastructure
 - determine what packages are available
 - no specific technique at this stage
 - from Rolls Royce experience – decision was already made by the company on which tool to purchase

Situation-2: At this point in the process, you have not identified any candidate products that would meet customer office requirements. However, some stakeholders have suggested 3 possible e-mail products. Brochures that provide marketing information on these products are available. So:

- what would be your next objective?
 - what techniques would you use to reach this objective?
-
- you want to have a pure requirements specification before identifying the capabilities
 - having a specification will avoid bias into the products
 - go to the e-mail vendor conference to identify products
 - visit vendors that have been shortlisted
 - talk to other users
 - get the users to try the product

- don't force people to use the product
- use prototype as a technique
- involve users in the selection process

Situation-3: You have now identified 30 candidate products in the market place. Access to these products and their suppliers is excellent. Furthermore, during the requirements acquisition process, over 45 requirements have been elicited. However, you do not have information about the products and their suppliers. So:

- what would be your next objective?
 - what techniques would you use to reach this objective?
- list requirements in priority
 - get marketing literature
 - get vendor literature
 - match capabilities to customer requirements
 - make sure that users are involved
 - shortlist on user requirements

Situation-4: At this next stage in the process, you have identified that a large number of the 30 candidate products offer similar functionality to meet your office requirements. For example, all the e-mail packages meet the following requirements:

- The system shall send messages;
- The system shall receive messages;
- The system shall forward received messages;
- The system shall print messages;
- The system shall spell check outgoing messages;
- The system shall delete messages.

The problem is that these requirements do not help you to discriminate between the packages. So:

- what would be your next objective?
 - what techniques would you use to reach this objective?
- all products will not meet the requirements exactly the same

- determine how well each product meets the requirements
- determine how well each product meet the core requirements
- use other requirements like cost, customer base to discriminate

Situation-5: Because of time pressure, you are unable to examine in detail all of the 30 candidate products you have identified. How would you reduce the number to a manageable list and on what basis would you base your decision to remove the product from the list:

- what would be your next objective?
- what techniques would you use to reach this objective?
- match the requirements and use compliance scores to eliminate the product from the list
- have a structured way of dealing with product elimination
- record why you took that decision and at what point so that you can go back to it later if need be
- have a group decision and let everybody sign up to it

Situation-6: At this stage in the process, 6 candidate e-mail products have been shortlisted. The process which led to short-listing these products was trouble-free although some suppliers who were not shortlisted were not happy with their rejection. However, how would you conduct evaluation sessions as a basis for selecting a final preferred product(s) from the 6 shortlisted:

- what would be your next objective?
- what techniques would you use to reach this objective?
- do more detailed analysis
- get people to try out or use the product
- have a structured process in advance on how you are going to do the selection
- have a vendor demonstration
- use demos for short listing
- look at the culture of the supplier as well and see if it fits with your culture
- consider non-technical issues as well

Situation-7: At this stage of the process, you have conducted the evaluation sessions of the 6 shortlisted products. How would you decide which products to reject from the final short-list and on what basis would select the final product(s):

- what would be your next objective?
 - what techniques would you use to reach this objective?
-
- list of your requirements will have functional requirements,
 - use differentiation factors between the requirements
 - base it on how you understand
 - functionality lower than non-functionality
 - use soft issues like the supplier capability
 - get stakeholder representatives to brainstorm
 - stakeholders to decide which one to select

COMMENTS

- product selection and recommendation is only the beginning
- selecting the tool is only the tip of an ice bag
- think of the problems of introducing the tool into the business environment
- how the vendor will support it
- managing the process of introducing the tool into the environment is important
- think of the impact of introducing the tool into the organisation and working patterns