

Requirements Capture

Chapter 6A

In this Lecture you will Learn:

- The distinction between the current and required systems
- When and how to apply the main fact finding techniques
- The roles played by users
- The need to document requirements

User Requirements

- Need to understand how the organization operates at present
- What are the problems with the current system?
- What are the requirements users have of a new system that are not in the current system?

Current System Investigating

- Much of the current system meets the needs of people who use it
- Sections of the system no longer meet the needs of the organization
- Some aspects of the organization's work are not covered by the current system
- The system can no longer evolve but needs to be replaced

Important of the Current System?

- It is important to understand current system to carry functionality forward into new system
- It is also important to understand it so that shortcomings and defects can be corrected in the new system



Opinion for Current System Investigating

- Ed Yourdon (1989) argues against spending a lot of time analysing the existing system
 - ◆ It's being replaced!
- **Structured System Analysis and Design (SSADM)** makes the case for modelling the current system
 - ◆ Much of its functionality will be required in the new system

Reasons for Investigating the Current System

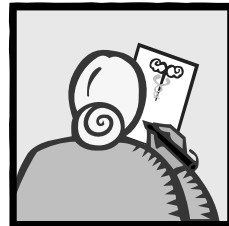
- Functionality is required in new system
- Data must be migrated into new system
- Technical documentation provides details of processing algorithms
- Defects of existing system must be avoided
- Parts of existing system may have to be kept
- We need to understand the work of the users
- Baseline information about the existing system helps set targets for the new one

New Requirements

- All this drives the need to replace systems and build new ones
 - ◆ Organizations operate in a rapidly changing business environment
 - ◆ Organizations operate in a changing technical environment
 - ◆ Governments and supra-governmental organizations introduce legislation
 - ◆ Organizations merge, de-merge, take over and get taken over

Types of Requirements

- Functional Requirement
- Non-functional Requirement
- Usability Requirement



Functional Requirements

- Describe what a system must do
- Often referred to **Functionality**
- Modelled with Use Case Diagrams.
 - ◆ Later will be modelled with other kinds of diagrams that show the structure of the system (Class Diagrams) and its behaviour (Interaction Diagrams and Statechart Diagrams)

Functional Requirement include:

- Descriptions of the processing that the system will be required to carry out.
- Details of the inputs into the system from paper forms and documents, from interactions between people, such as telephone call, and from other systems.
- Details of the output that are expected from the system in the form of printed documents and reports, screen displays and transfers to other system.
- Details of data that must be held in the system.

Non-functional Requirements

- Concerned with how well the system performs
- Documented in Requirements List or in Use Case Model (for requirements that can be linked to specific use cases)

Non-functional Requirements include:

- Performance criteria such as desired response times for updating data in the system or retrieving data from the system
- Anticipated volumes of data, either in terms of throughput or of what must be stored
- Security considerations

Usability Requirements

- Concerned with matching the system to the way that people work
- Sets measurable objectives
- Documented in Requirements List
- May be tested by Prototypes

Usability Requirements include:

- Characteristics of the users who will use the system
- The tasks that users undertake, including the goals that they are trying to achieve
- Situational factors that describe the situational that could arise during system use
- Acceptance criteria by which the user will judge the delivered system

Fact Finding Techniques

- Background Reading / Research
- Interviewing
- Observation / Focus Group
- Document Sampling
- Questionnaires



Background Reading

- To understand the organization and its business objectives
- Includes:
 - ◆ Company reports
 - ◆ Organization charts
 - ◆ Policy manuals
 - ◆ Job descriptions
 - ◆ Documentation of existing systems
 - ◆ Sample document
 - ◆ Reports

Background Reading

- Advantages
 - ◆ Helps to understand the organization before meeting the people who work there
 - ◆ Helps to prepare for other types of fact finding
 - ◆ Documentation of existing system may help to identify requirements for functionality of new system

Background Reading

- Disadvantages
 - ◆ Written documents may be out of date or not match the way the organization really operates



Background Reading

- Appropriate Situations
 - ◆ Analyst is not familiar with organization
 - ◆ Initial stages of fact finding

Interviewing

- To get an in-depth understanding of the organization's objectives, users' requirements and people's roles using structured meetings and informal meetings
- Includes:
 - ◆ **Managers** to understand objectives
 - ◆ **Staff** to understand roles and information needs
 - ◆ **Customers** and the public as potential users

Interviewing

- Advantages
 - ◆ Personal contact allows the interviewer to respond adaptively to what is said
 - ◆ It is possible to probe in greater depth
 - ◆ If the interviewee has little or nothing to say, the interview can be terminated

Interviewing

- Disadvantages
 - ◆ Can be time-consuming and costly
 - ◆ Notes must be written up or tapes transcribed after the interview
 - ◆ Can be subject to bias
 - ◆ If interviewees provide conflicting information this can be difficult to resolve later

Interviewing

- Appropriate Situations
 - ◆ Most projects
 - ◆ At the stage in fact finding when in-depth information is required

Observation

- To see what really happens, not what people say happens.
- Includes:
 - ◆ Seeing how people carry out processes
 - ◆ Seeing what happens to documents
 - ◆ Obtaining quantitative data as baseline for improvements provided by new system
 - ◆ Following a process through end-to-end, can be open-ended or based on a schedule

Observation

- Advantages
 - ◆ First-hand experience of how the system operates
 - ◆ High level of validity of the data can be achieved
 - ◆ Verifies information from other sources
 - ◆ Allows the collection of baseline data

Observation

- Disadvantages
 - ◆ People don't like being observed and may behave differently, distorting the findings
 - ◆ Requires training and skill
 - ◆ Logistical problems for the analyst with staff who work shifts or travel long distances
 - ◆ Ethical problems with personal data

Observation

- Appropriate Situations
 - ◆ When quantitative data is required
 - ◆ To verify information from other sources
 - ◆ When conflicting information from other sources needs to be resolved
 - ◆ When a process needs to be understood from start to finish

Document Sampling

- To find out the information requirements that people have in the current system, and to provide statistical data about volumes of transactions and patterns of activity
- Includes:
 - ◆ Obtaining copies of empty and completed documents
 - ◆ Counting numbers of forms filled in and lines on the forms
 - ◆ Screenshots of existing computer systems

Document Sampling

- Advantages
 - ◆ For gathering quantitative data
 - ◆ For finding out about error rates

Document Sampling

- Disadvantages
 - ◆ Not helpful if the system is going to change dramatically



Document Sampling

- Appropriate Situations
 - ◆ Always used to understand information needs
 - ◆ Where large volumes of data are processed
 - ◆ Where error rates are high

Questionnaires

- To obtain the views of a large number of people in a way that can be analysed statistically
- Includes:
 - ◆ Postal, web-based and email questionnaires
 - ◆ Open-ended and closed questions
 - ◆ Gathering opinion as well as facts

Questionnaires (Sample)

YES/NO Questions				
Do you print reports from the existing system? (Please circle the appropriate answer.)	YES	NO	10	
Multiple Choice Questions				
How many new clients do you obtain in a year? (Please tick one box only.)	a) 1-10	<input type="checkbox"/>	11	
	b) 11-20	<input type="checkbox"/>		
	c) 21-30	<input type="checkbox"/>		
	d) 31 +	<input type="checkbox"/>		
Scaled Questions				
How satisfied are you with the response time of the stock update? (Please circle one option.)				
1. Very satisfied	2. Satisfied	3. Dissatisfied	4. Very dissatisfied	12
Open-ended Questions				
What additional reports would you require from the system?				

Questionnaires

- Advantages
 - ◆ Economical way of gathering information from a large number of people
 - ◆ Effective way of gathering information from people who are geographically dispersed
 - ◆ A well designed questionnaire can be analysed by computer

Questionnaires

- Disadvantages
 - ◆ Good questionnaires are difficult to design
 - ◆ No automatic way of following up or probing more deeply
 - ◆ Postal questionnaires suffer from low response rates



Questionnaires

- Appropriate Situations
 - ◆ When views of large numbers of people need to be obtained
 - ◆ When staff of organization are geographically dispersed
 - ◆ For systems that will be used by the general public and a profile of the users is required

Class Exercise

- Name the five main fact finding techniques and list one advantage and one disadvantage of each.

User Involvement

- A variety of stakeholders
 - ◆ Senior management – with overall responsibility for the organization
 - ◆ Financial managers – who control budgets
 - ◆ Managers of user departments
 - ◆ Representatives of users of the system

User Involvement

- Different roles
 - ◆ Subjects of interviews to establish requirement
 - ◆ Representatives on project committees
 - ◆ Evaluators of prototypes
 - ◆ Testers
 - ◆ As trainees on courses
 - ◆ End-users of new system

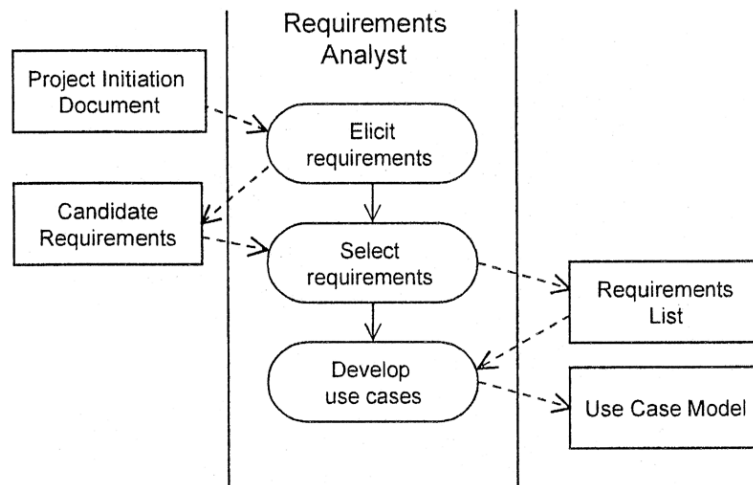
Documenting Requirements

- Documentation should follow organizational standards
- CASE tools that produce UML models maintain associated data in a repository
- Some documents will need separate storage in a filing system:
 - ◆ Interview notes
 - ◆ Copies of existing documents
 - ◆ Minutes of meetings
 - ◆ Details of requirements

Documenting Requirements

- Documents should be kept in a document management system with version control
- Use use cases to document functional requirements
- Maintain a separate requirements list
- Review requirements to exclude those that are not part of the current project

Activity Diagram to show the activities involved in Capturing Requirement



Activity diagram for Requirement Capture and Modeling

