

## Requirements Capture

## 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

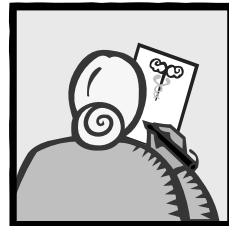
- Functionality is required in new system
- Data must be migrated into new system
- Technical documentation provides details of processing algorithms
- Defects of existing system must be avoided
- Parts of existing system may have to be kept
- We need to understand the work of the users
- Baseline information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

## New Requirements

- 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
- All this drives the need to replace systems and build new ones

## 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
- Interviewing
- Observation
- Document Sampling
- Questionnaires



## Background Reading

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

## 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
- 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

## Questionnaire (Sample)

<b>YES/NO Questions</b>				
Do you print reports from the existing system? (Please circle the appropriate answer.)	YES	NO	10	
<b>Multiple Choice Questions</b>				
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"/>		
<b>Scaled Questions</b>				
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
<b>Open-ended Questions</b>				
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

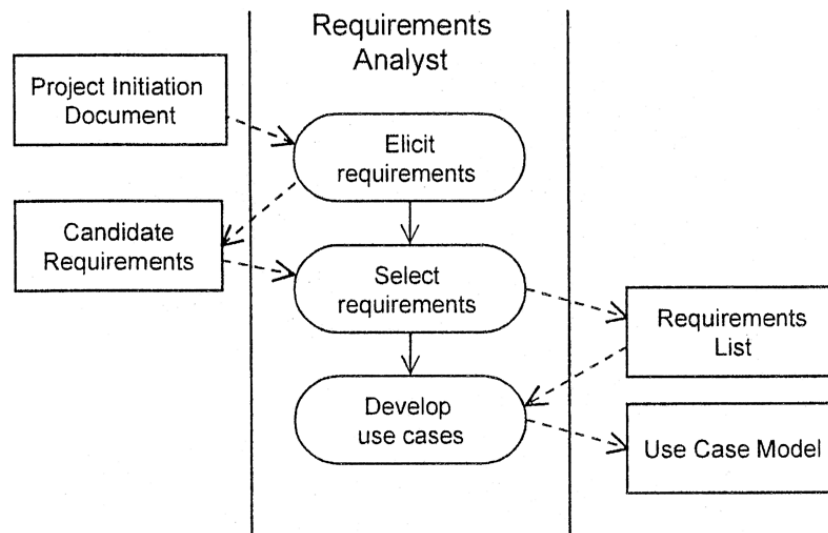
## Documenting Requirements

- 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

