Requirements Capture

Based on Chapter 6
Bennett, McRobb and Farmer

Object Oriented Systems Analysis and Design Using UML
4th Edition, McGraw Hill, 2010

Mc Graw Hill Education

© 2010 Bennett, McRobb and Farmer

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

© 2010 Bennett, McRobb and Farmer

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?

© 2010 Bennett, McRobb and Farmer

Current System

- 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

© 2010 Bennett, McRobb and Farmer

Current System

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

© 2010 Bennett, McRobb and Farmer

Current System

- Advocates of Agile methods focus on developing the new system and not on extensive analysis of the existing system
- In the Agile Manifesto they state that they value working software over comprehensive documentation

© 2010 Bennett, McRobb and Farmer

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

© 2010 Bennett, McRobb and Farmer

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, demerge, take over and get taken over
- All this drives the need to replace systems and build new ones

© 2010 Bennett, McRobb and Farmer

Types of Requirements

- Functional
- Non-functional
- Usability

© 2010 Bennett, McRobb and Farmer

Functional Requirements

- Describe what a system must do
- Include:
  - processes
  - interfaces with users and other systems
  - what the system must hold data about
- 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 State Machines)

© 2010 Bennett, McRobb and Farmer

Non-functional Requirements

- Concerned with how well the system performs
- Include:
  - response times
  - volumes of data
  - security considerations
- Documented in Requirements List or in Use Case Model (for requirements that can be linked to specific use cases)

© 2010 Bennett, McRobb and Farmer

Usability Requirements

- Concerned with matching the system to the way that people work
- Sets measurable objectives
- Include:
  - characteristics of users
  - tasks users undertake
  - situational factors
  - acceptance criteria for the working system
- Documented in Requirements List. May be tested by Prototypes

© 2010 Bennett, McRobb and Farmer

Fact Finding Techniques

- Background Reading
- Interviewing
- Observation
- Document Sampling
- Questionnaires

© 2010 Bennett, McRobb and Farmer

Background Reading

- Aim is to understand the organization and its business objectives
- Includes:
  - reports
  - organization charts
  - policy manuals
  - job descriptions
  - documentation of existing systems

© 2010 Bennett, McRobb and Farmer

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

© 2010 Bennett, McRobb and Farmer

Background Reading

- Disadvantages:
  - written documents may be out of date or not match the way the organization really operates
- Appropriate situations:
  - analyst is not familiar with organization
  - initial stages of fact finding

© 2010 Bennett, McRobb and Farmer

Interviewing

- Aim is 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

© 2010 Bennett, McRobb and Farmer

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

© 2010 Bennett, McRobb and Farmer

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

© 2010 Bennett, McRobb and Farmer

Interviewing

- Appropriate situations:
  - most projects
  - at the stage in fact finding when in-depth information is required

- Requires skill to carry out effectively (See Box 6.1 for guidelines)

© 2010 Bennett, McRobb and Farmer

Observation

- Aim is 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

© 2010 Bennett, McRobb and Farmer

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

© 2010 Bennett, McRobb and Farmer

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

© 2010 Bennett, McRobb and Farmer

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

© 2010 Bennett, McRobb and Farmer

Document Sampling

- Aims to find out the information requirements that people have in the current system
- Also aims 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

© 2010 Bennett, McRobb and Farmer

Document Sampling

- Advantages:
  - good for gathering quantitative data
  - good for finding out about error rates
- Disadvantages:
  - not helpful if the system is going to change dramatically
- Appropriate situations:
  - always used to understand information needs
  - where large volumes of data are processed
  - where error rates are high

© 2010 Bennett, McRobb and Farmer

Questionnaires

- Aims 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

© 2010 Bennett, McRobb and Farmer

YES/NO Questions

Do you print reports from the existing system? YES NO 10
(Please circle the appropriate answer.)

Multiple Choice Questions

How many new clients do you obtain in a year? 11
(Please tick one box only.)

a) 1–10 ☐
b) 11–20 ☐
c) 21–30 ☐
d) 31 + ☐

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?

_____

_____

_____

© 2010 Bennett, McRobb and Farmer

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

© 2010 Bennett, McRobb and Farmer

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

© 2010 Bennett, McRobb and Farmer

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

© 2010 Bennett, McRobb and Farmer

Questionnaires

- Require skill to design effectively (See Box 6.2 for guidelines)

© 2010 Bennett, McRobb and Farmer

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

© 2010 Bennett, McRobb and Farmer

User Involvement

- Different roles:
  - as subjects of interviews
  - as representatives on project committees
  - as evaluators of prototypes
  - as testers
  - as trainees on courses
  - as end-users of new system

© 2010 Bennett, McRobb and Farmer

Documenting Requirements

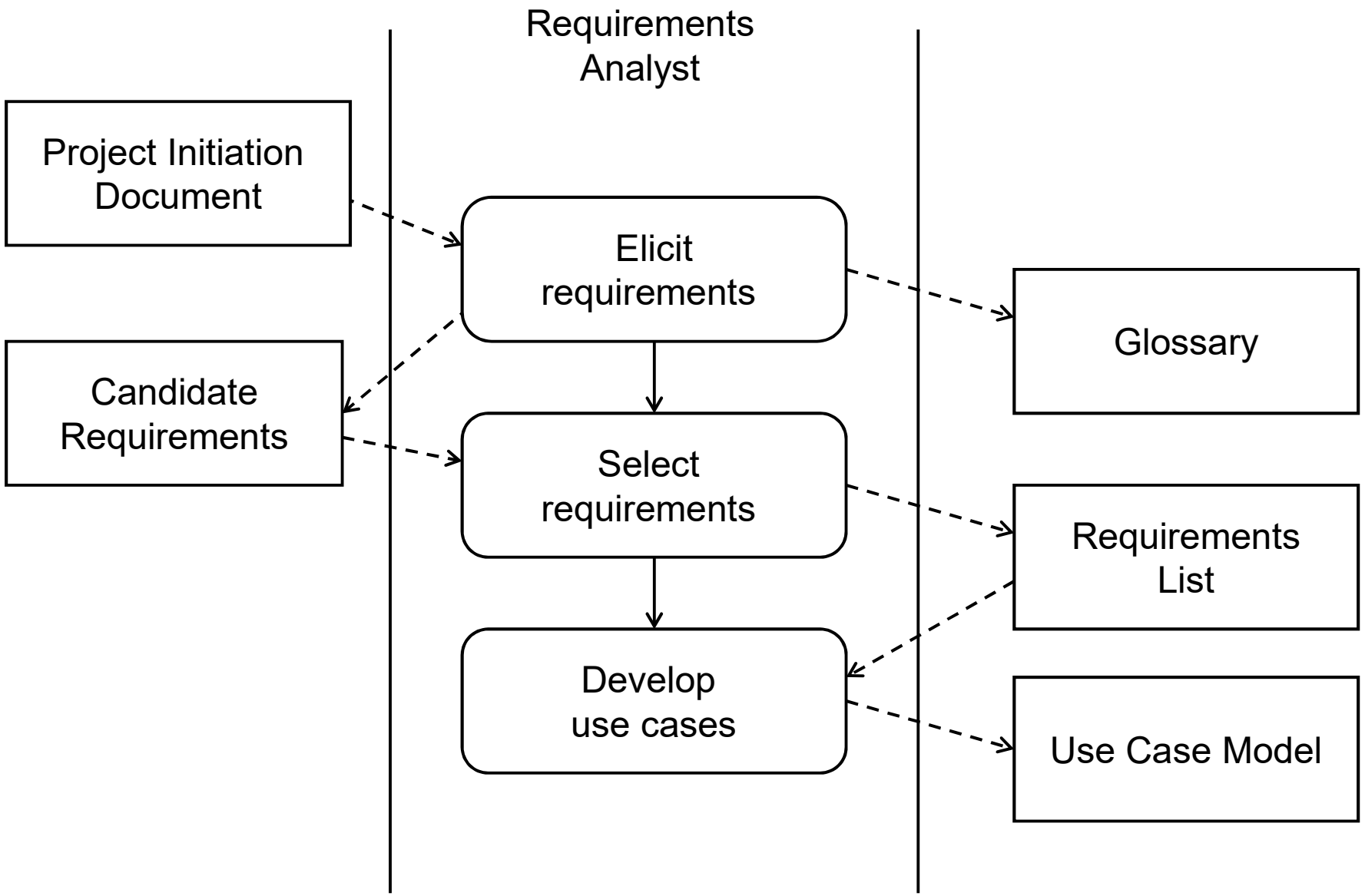
- Documentation should follow organizational standards
- Modelling tools that produce UML models maintain associated data in a repository
- Some documents will need separate storage in a filing system:
  - interview notes
  - copies of existing documents
  - minutes of meetings
  - details of requirements

© 2010 Bennett, McRobb and Farmer

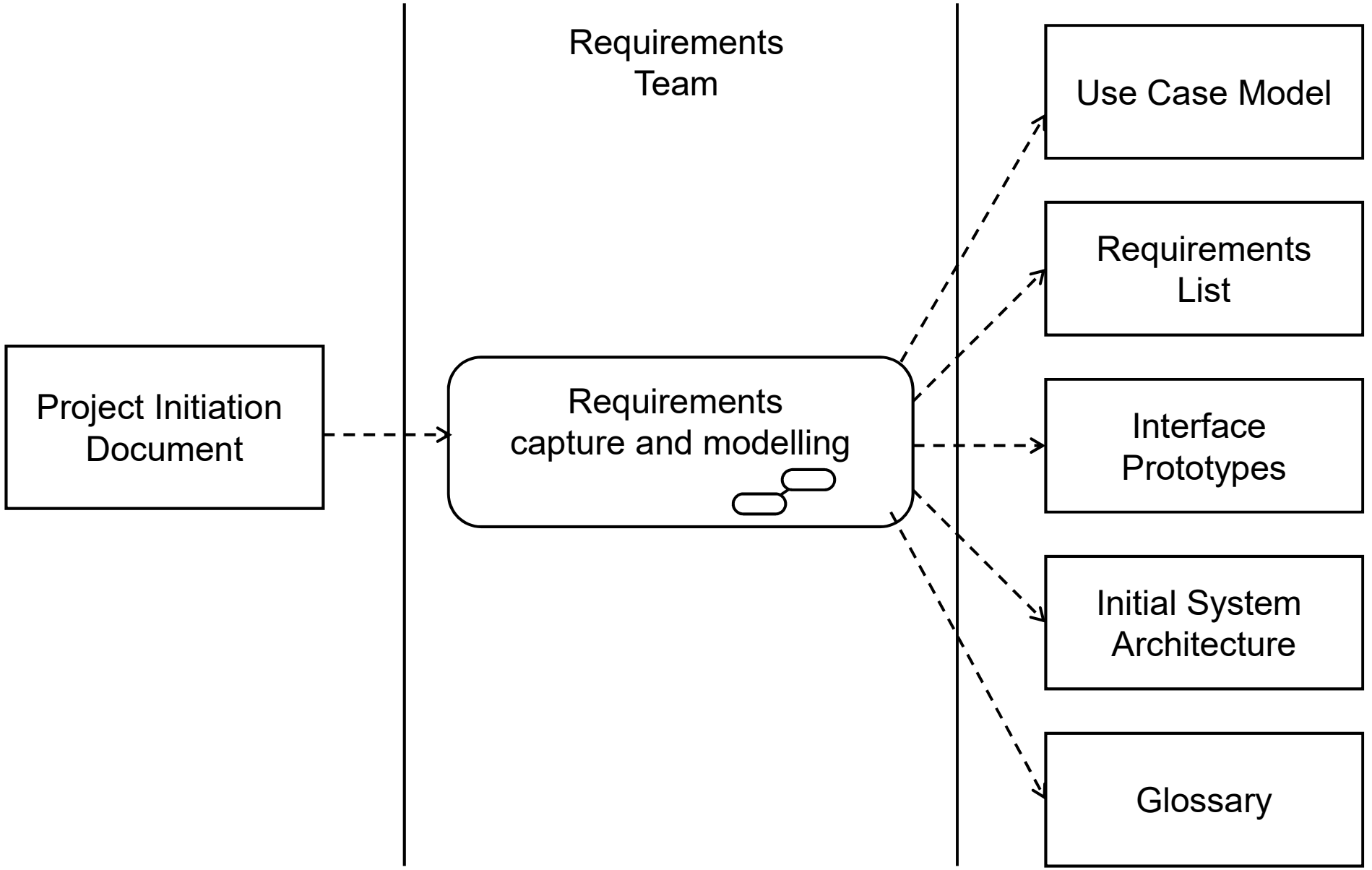
Documenting Requirements

- 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

© 2010 Bennett, McRobb and Farmer



© 2010 Bennett, McRobb and Farmer



© 2010 Bennett, McRobb and Farmer

Summary

In this lecture you have learned about:

- 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

© 2010 Bennett, McRobb and Farmer

References

- Oppenheim (2000)
- Allison et al. (1996)
- Usability is covered in more detail in Chapter 16 of Bennett, McRobb and Farmer
- Chapter A2 shows products of requirements capture and modelling

  (For full bibliographic details, see Bennett, McRobb and Farmer)

© 2010 Bennett, McRobb and Farmer