

CHAPTER 2: Investigating System Requirements

Technology architecture

- A set of computing hardware, network hardware and topology, and system software employed by an organization

Application architecture

- The organization and construction of software resources to implement an information system

SYSTEMS ANALYSIS ACTIVITIES

- The systems support and security phase is an important component of TCO (total cost of ownership) because ongoing maintenance expenses can determine the economic life of a system.
- 5 Systems Analysis Activities:
 1. Gather detailed information
 2. Define requirements
 3. Prioritize requirements
 4. Develop user-interface dialogs
 5. Evaluate requirements with users

Core Processes	Iterations					
	1	2	3	4	5	6
Identify problem and obtain approval	[Activity duration across iterations 1-6]					
Plan and monitor the project	[Activity duration across iterations 1-6]					
Discover and understand details	[Activity duration across iterations 1-6]					
Design system components	[Activity duration across iterations 1-6]					
Build, test, and integrate system components	[Activity duration across iterations 1-6]					
Complete system tests and deploy solution	[Activity duration across iterations 1-6]					

Systems Analysis - discover and understand the details.

- Define in greater detail that System Planning what the information system needs
- The first pass generates only enough detail to decide whether a new or upgraded system is warranted and feasible.
- Analysis activities are most intensive in the second iteration

Gather Detailed Information

- Systems analysts obtain information from users by interviews or through observation of duties performed
- Additional information is gained from reviewing planning documents, policy statements, documentation of existing systems, similar external companies and vendors systems implementations
- Analyst should become an expert in the business area the system will support

Define Requirements

- Using information gathered from users and documents define requirements for the new system.
- Create requirements models

Prioritize Requirements

- Once the system requirements are understood, establish which requirements are most crucial for the system. Resources are limited - most critical functions to be implemented first.

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Develop User-Interface Dialogs

- Developing user-interface dialogs helps obtain and document requirements

Evaluate Requirements with Users

REQUIREMENTS

System Requirement - the activities a system must perform or support and the constraints that the system must meet. 2 categories: functional and non-functional requirements

Functional Requirements - the activities that the system must perform

- Are based on the procedures and rules that the organization uses to run its business

Non-functional requirements - the characteristics of the system other than those activities it must perform or support i.e. Usability, Reliability, Performance, Security, Design constraints, FURPS+ : Implementation requirements, Interface requirements, Physical requirements, Supportability requirements

MODELLING

Build models to describe system requirements and use those models to communicate with users and designers

- A model is a representation of some aspect of the system being built

3 Types of Models

- Textual models — memos, reports, narratives, and lists to describe requirements that are detailed and are difficult to represent in other ways
- Graphical models - simplify the understanding of complex relationships. Drawn according to the notation specified by the Unified Modelling Language (UML).
- Mathematical models - one or more formulas that describe technical aspects of a system

STAKEHOLDERS FOR FACT FINDING

- All the people who have an interest in the successful implementation of the system.
- Internal stakeholders - persons within the organization who interact with the system or have a significant interest in its operation or success
- External stakeholders - persons outside the organization who interact with the system or have a significant interest in its operation or success
- Operational stakeholders - persons who regularly interact with a system in the course of their jobs or lives
- Executive stakeholders - are those who do not interact directly with the system but who either use information produced by the system or have a significant financial or other interest in its operation and success. System requirements by exec stakeholders have significant legal and financial implications.
- The client is the person or group that provides the funding for the project.

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INFORMATION-GATHERING TECHNIQUES

6 Techniques for gathering detailed requirements information include:

1. Interviewing users and other stakeholders
2. Distributing and collecting questionnaires
3. Reviewing inputs, outputs, and documentation
4. Observing and documenting business procedures
5. Researching vendor solutions
6. Collecting active user comments and suggestions

Typical steps by Systems Analysts:

- Prepare detailed questions
- Meet with individuals or groups of users
- Obtain and discuss answers to the questions
- Document the answers
- Follow up as needed in future meetings or interviews

Checklist for Conducting an Interview

Preparation (Before)

- Establish the objective for the interview
- Determine correct user(s) to be involved
- Determine project team members to participate
- Build a list of questions and issues to be discussed
- Review related documents and materials
- Set the time and location
- Inform all participants of objective, time, and locations

Conduct Interview (During)

- Review notes for accuracy, completeness, and understanding
- Transfer information to appropriate models and documents
- Identify areas needing further clarification
- Thank the participants
- Follow up on open and unanswered questions
- Arrive on time
- Look for exception and error conditions
- Probe for details
- Take thorough notes
- Identify and document unanswered items or open questions

Follow-up Interview session (After)

- Review notes for accuracy, completeness, and understanding
- Transfer information to appropriate models and documents
- Identify areas needing further clarification
- Thank the participants
- Follow up on open and unanswered questions / outstanding or unresolved issues – **open items list**
 - outstanding or unresolved issues

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Distribute and Collect Questionnaires

- Questionnaires enable analysts to collect information from a large number of stakeholders.
- Even if the stakeholders are widely distributed geographically, they can still help define requirements through questionnaires

Review Inputs, Outputs, and Procedures

- Two sources of information:
 1. External - industry-wide professional organizations and other companies
 2. Internal - internal documents and procedures

Observe and Document Business Processes

- Observing a business process in action will help the analyst understand the business functions

Vendor Research

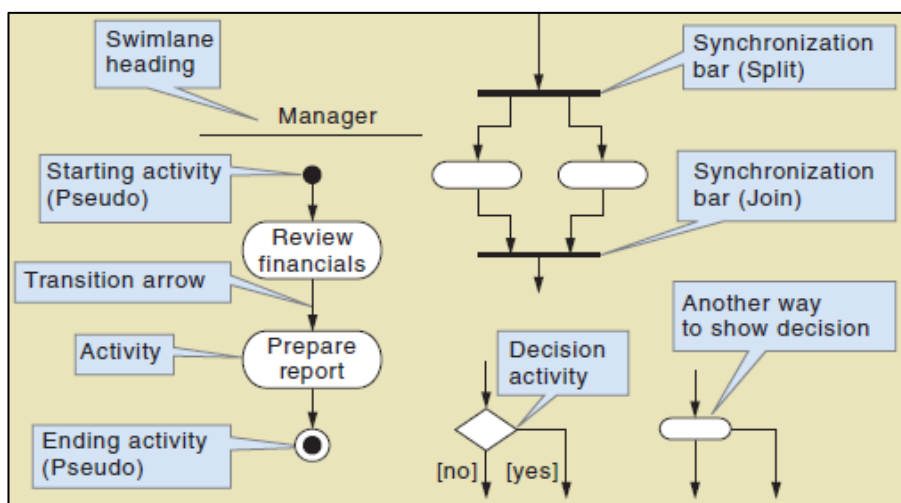
- Consulting firms often have experience with the same problems, and software firms may have already packaged solutions for a particular business need
- Taking advantage of existing knowledge or solutions can avoid costly mistakes and save time and money
- Cheaper and less risky to buy a solution rather than to build it

Collect Active User Comments and Suggestions

- User feedback from initial and later testing is a valuable source of requirements information

DOCUMENTING WORKFLOWS WITH ACTIVITY DIAGRAMS

- **Workflow** - the sequence of processing steps that completely handles one business transaction or customer request
- **Activity diagram** - describes the various user (or system) activities, the person who does each activity, and the sequential flow of these activities
- **Synchronization bar** - the activity diagram component that either splits a control path into multiple concurrent paths or recombines concurrent paths
- **Swimlane heading** - represents an agent who performs the activities



Activity diagram symbols