TRƯỜNG ĐẠI HỌC BÁCH KHOA HÀ NỘI
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Systems analysis activities
Requirement analysis

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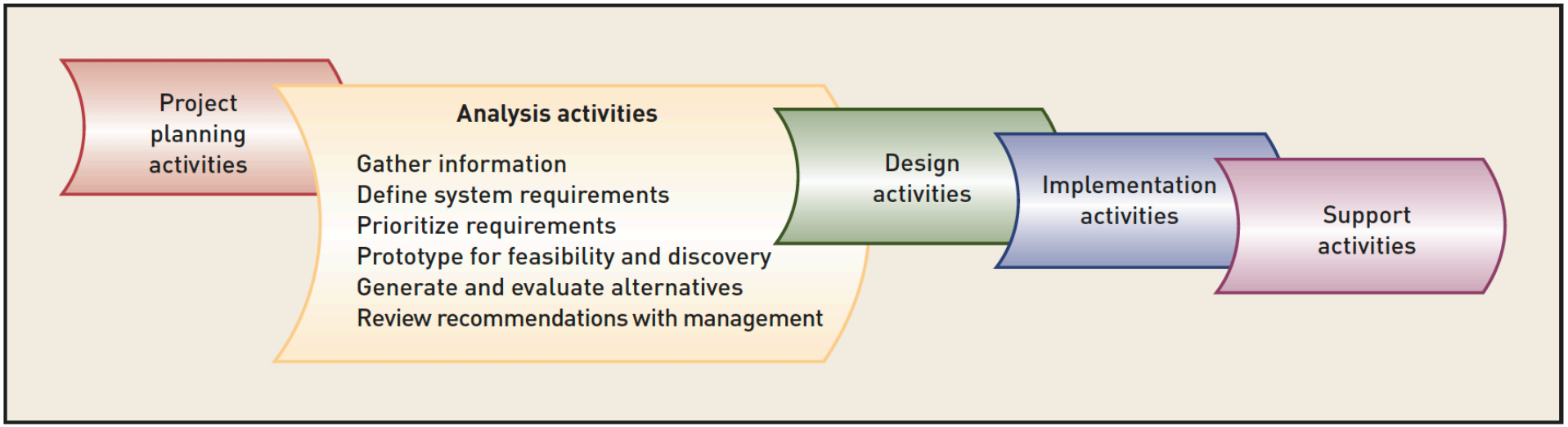
Outline

- Gathering requirements
- Types of requirements
- Identifying stakeholders
- Techniques for information gathering
- Validating the requirements

Analysis activities

- Requirements Analysis and Gathering
- Modeling
- Stakeholders
- Information gathering



Gathering requirements

- Regardless of what we want to do
  - Improve
  - Update
  - Replace
- We need to gain a deep understanding of the requirements
  - be systematic
  - document and communicate these requirements
  - refine the requirements

Gather details about the system

- What does the system need to do?
  - This is called systems analysis
- Multiple passes will likely be required
  - first pass: is an update needed? Possible?
  - second pass: gather detailed information about what the system does
  - subsequent passes: refine and correct requirements

Gathering detailed information

- What kinds of information should we gather?
- How should we gather it?
- From whom?

Define system requirements

- System requirements are specifications that define the functions to be provided by a system
- Functional requirements
  - functions the system must perform
- Non-functional requirements
  - UI formats
  - Performance needs
  - Security needs
  - Reliability needs

Functional requirements

- Activities of the system that must be performed
- Business uses
  - calculate payroll taxes
  - generate timesheets
- Based on the rules and processes of the organization
- Discovering all these requirements is vital and difficult
  - If you don’t get it right, your solution will not be well received

Non-functional requirements (FURPS)

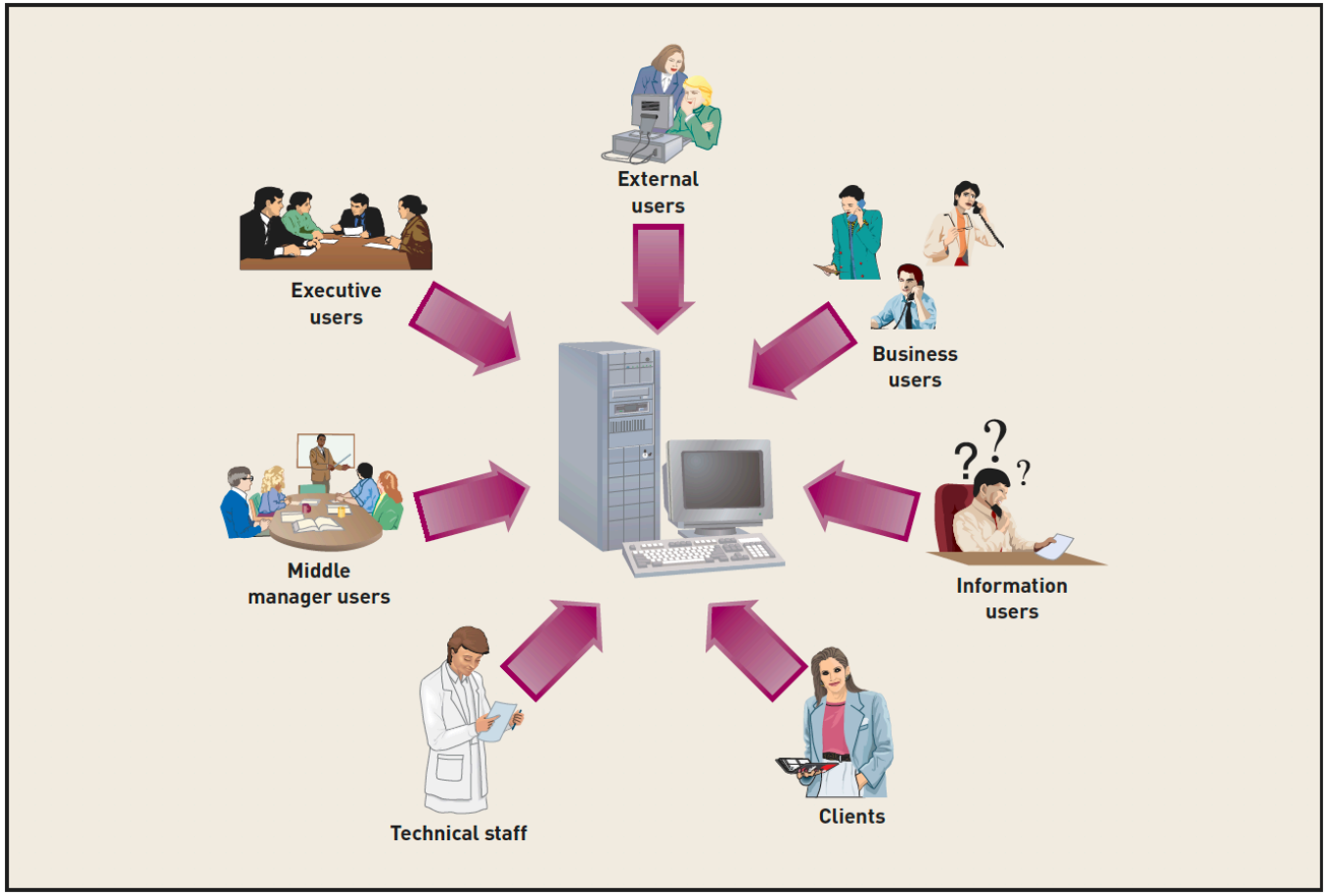
- Characteristics of the system other than activities it must perform or support, such as technology, performance, usability, reliability, and security

Non-functional requirements (FURPS)

- Usability requirements
  - describe operational characteristics related to users, such as the user interface, related work procedures, online help, and documentation
    - menu placement and format, color schemes, use of the organization's logo, etc.
- Reliability requirements
  - How often do service interruptions or outages occur?
  - How does the system detect and cope with errors?
- Performance requirements
  - describe operational characteristics related to measures of workload, such as throughput and response time
- Security requirements
  - describe which users can perform what system functions under what conditions
- Technical requirements
  - describe operational characteristics related to the environment, hardware, and software of the organization

Stakeholders – the source of system requirements

- All the people who have an interest in the success of a new system

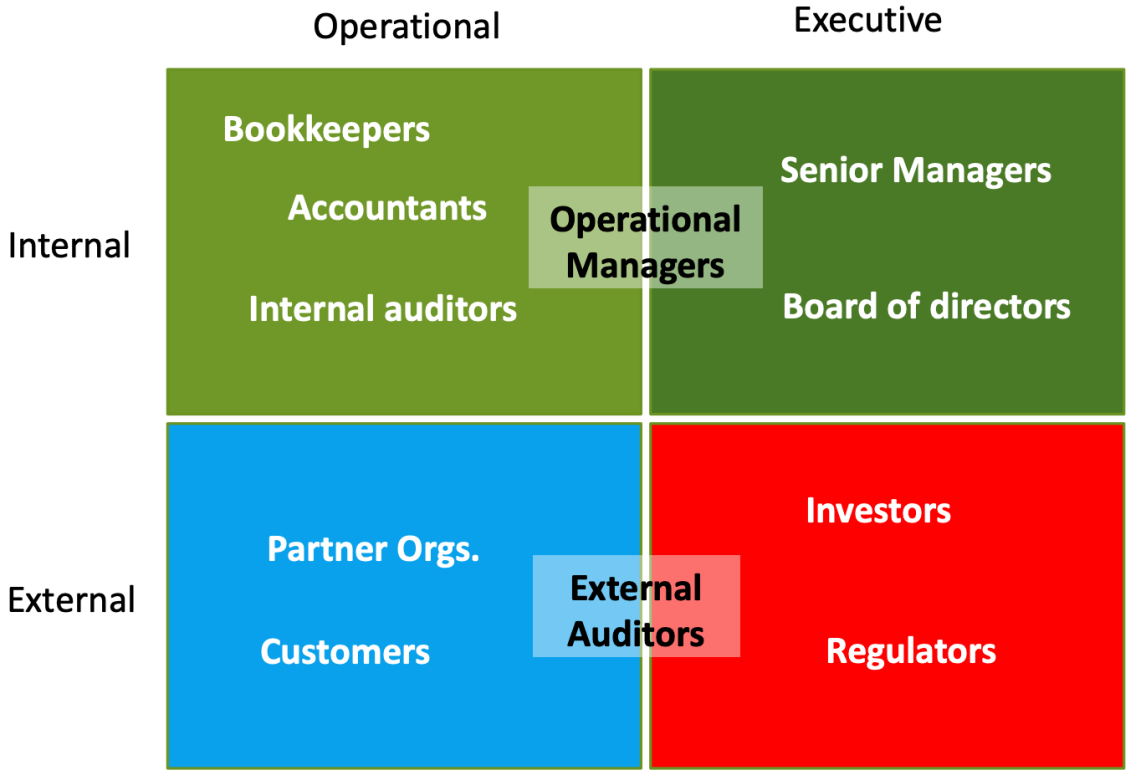


Identifying stakeholders

- Internal Stakeholders
  - Employees
  - people who use the system
  - people who's job is impacted by the system
- External Stakeholders
  - Suppliers
  - Partners
  - Shipping companies
  - Students

Identifying stakeholders

- Operational stakeholders
  - direct users of the system
- Executive stakeholders
  - don't interact with the system



Users as stakeholders

- Business Users
  - Business users are the people who use the system to perform the day-to-day operations of an organization
  - Business users provide information about the daily operations of the business and ways the system must support them
- Information Users
  - a person who needs current information from the system. This person might be an operational user
  - an information user may not be allowed to enter information on business transactions, just to view specific information
  - An information user, then, provides an analyst with insight about what kinds of information should be available daily, weekly, monthly, and annually, and about what format is most convenient
- Management Users
  - need statistics and summary information from a system
  - Management will help an analyst answer the following types of questions:
    - What kinds of reports must the system produce?
    - What kind of performance statistics must the system maintain?

Users as stakeholders (2)

- Executive Users
  - interested in strategic issues
  - They typically want information from a system so that they can compare overall improvements in resource utilization
  - They might want the system to interface with other systems to provide strategic information on trends and directions of the industry and the business.
- External Users
  - Suppliers
  - Partners
  - Shipping companies
  - Students

Techniques for information gathering

- Interviews
- Questionnaires
- System inputs and outputs
- Documentation
- Observation
- Research other solutions
- Gather user comments and suggestions

Asking the right questions

- How to develop good questions
  - Identify important themes
  - Create questions that target each theme
  - Have both open and closed ended questions
- How to get an interview right
  - prepare, prepare, prepare
  - plan ahead
  - arrive with enough time
  - keep interview short
  - pay attention for exceptions or problems
  - details, details, details
  - take good notes
  - follow up on the interview

Important themes

- What are the business processes?
  - keep in mind difference between existing and new system
  - the system may take over steps that the worker used to do
- How should business operations be performed?
  - how will new system change these operations?
  - how will new system support these operations?
  - how can new tech/systems make processes more efficient
- What info is needed to perform business operations?
  - formal and informal information
  - look for exceptions and unusual situations
  - identify non-routine information requirements

Theme	Questions to users
What are the business operations and processes?	What do you do?
How should those operations be performed?	How do you do it? What steps do you follow?
What information is needed to perform those operations?	What information do you use? What forms or reports do you use?

Prototype for feasibility and discovery

- Develop some UI dialogs
- Users' input is necessary to ensure the system works
  - Prototypes
  - storyboards
- Need a way to test the system to see
  - if it makes sense to users
  - if it meets the users' needs
- UI dialogs are a good approach because
  - they will elicit more feedback than just asking questions
  - users should be able to make sense of it
- Should represent all working portions of this iteration

Models and modeling

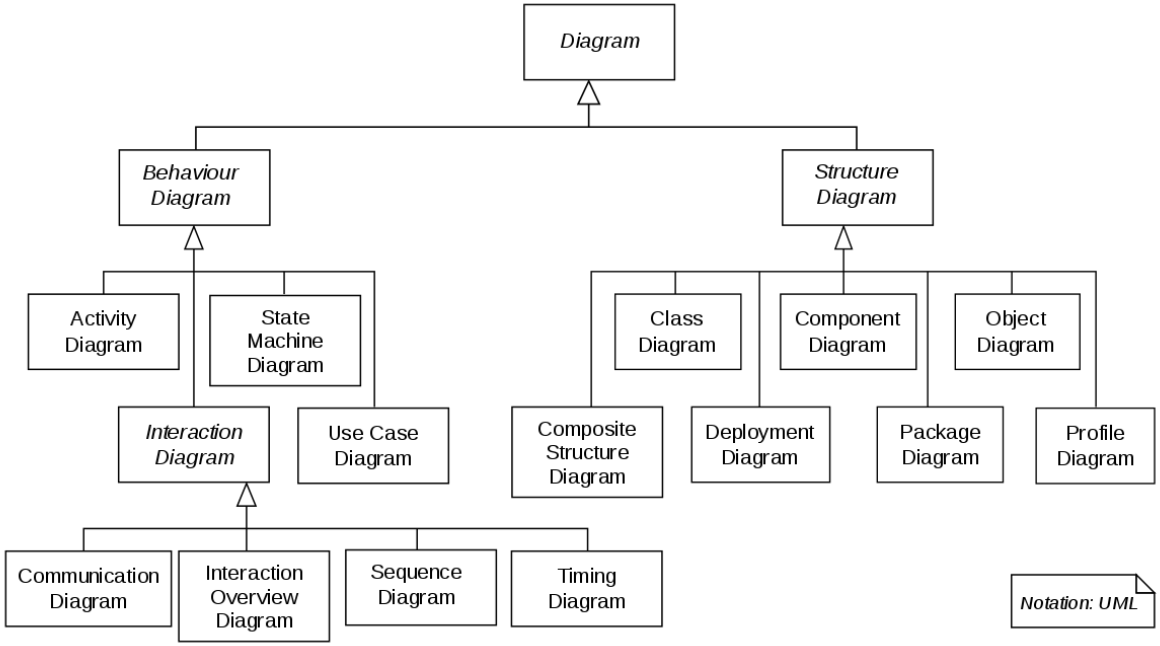
- A model is not only documentation produced after the analysis and design work is done
- The process of creating a model helps an analyst clarify and refine the design
- Models are useful for
  - communicating ideas to others
  - showing that you understand the system
  - finding errors
  - learning about the system
  - dealing with complexity
- Documentation for later
  - Maintenance
  - Updates
  - upgrades

Logical model

- Two types of system models are created to help record and communicate what is required
  - A logical model shows what the system is required to do in great detail, without committing to any one technology
    - focus its efforts first on what is needed, not what form it will take
  - A physical model, on the other hand, shows how the system will actually be implemented.
- Systems analysis involves creating detailed logical models, and systems design involves detailed physical models.

Kinds of models

- Textual models
- Graphical models
  - UML
- Mathematical models



Prioritizing requirements

- Which are most important?
- Which are least important?
- When requirements are prioritized, the analyst can generate several alternatives by eliminating some of the less important requirements

Validating the requirements

- Structured walkthrough is a review of the findings from your investigation and of the models built based on those findings
- What and when
  - smaller walkthroughs every week or two with members of the project team
- Who
  - it is best to have other experienced analysts involved
  - the appropriate stakeholders should be involved
  - A librarian, a helper for the presenter, documents the comments made by the reviewers.
- How
  - prepares material for review
  - presents the material point by point

User-evaluation

- Done iteratively
  - you should get feedback
  - inform changes
  - users' time is valuable
    - will likely only get short sessions
- Early iterations
  - quick and dirty
    - paper prototypes, storyboards
- Later iterations
  - higher-fidelity
  - more interactional
- Review recommendations with management

Practice questions

- The real estate business relies on an extensive amount of information used in the buying and selling of real property. Most communities of real estate agents and brokers have formed cooperative organizations to help consolidate and distribute information on the real estate profession, real estate trends, properties in the community, historical records of property sales, and current listings of properties for sale. These organizations are usually referred to as the Community Board of Realtors.
- Try to answer these questions:
  - 1. Who are the stakeholders for the issues related to real estate in your community, and what are their main interests?
  - 2. What types of information do you think the board collects and make available to its members and to the community?
  - 3. What are some cultural and legal issues that impact real estate in Canada.
  - 4. If you were working on support for an international real estate cooperative system, in what ways would the information collection activity process be complicated?

Thank you for your attention!
Q&A