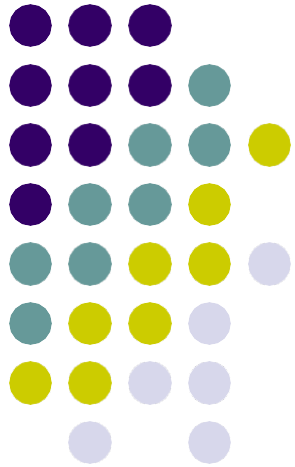


Course Code: IS332
Analysis and Design of Information Systems



By

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Faculty of Computers and Artificial Intelligence
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Lecture Rules

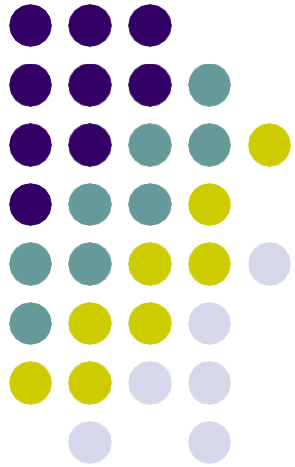






Investigating System Requirements

Chapter 2



Systems Analysis and Design in a Changing World 7th Ed

Satzinger, Jackson & Burd



Chapter 2 Outline



The RMO Consolidated Sales and Marketing System Project

Systems Analysis Activities

What Are Requirements?

Stakeholders

Information-Gathering Techniques

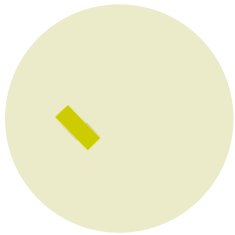
Models and Modeling

Documenting Workflows with Activity Diagrams

Learning Objectives



Describe the **activities** of systems analysis



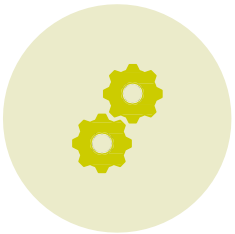
Explain the difference between **functional** and **nonfunctional** requirements



Identify and understand different kinds of **stakeholders** and their **contributions** to requirements definition



Describe **information-gathering techniques** and determine when each is best applied



Describe the role of models and **UML** in systems analysis

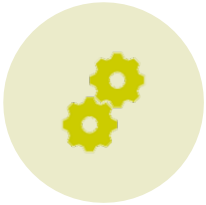


Develop **UML activity diagrams** to model workflows

Overview



Chapter 1 introduced the system development lifecycle (SDLC) and demonstrated its use for a small project



This chapter expands the SDLC processes to cover a wider range of concepts, tools and techniques



Core process 3: Discover and understand the details of the problem or need—is the main focus of **systems analysis**

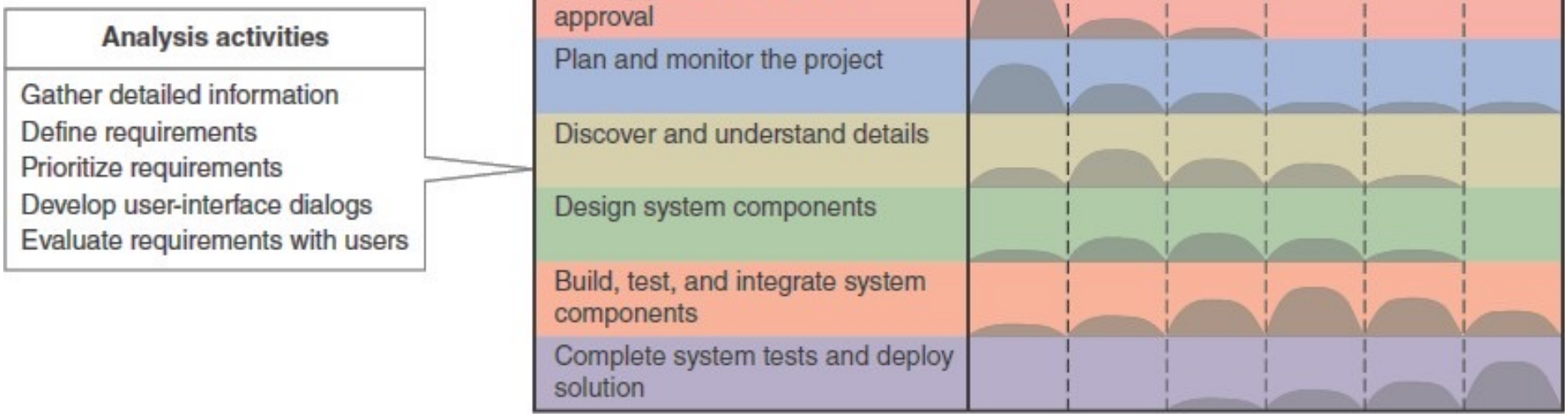


Systems analysis activities are detailed in this chapter



A larger Ridgeline Mountain Outfitters (RMO) project is introduced that will be used throughout the text to illustrate analysis and design

Systems Analysis Activities
Involve discovery and understanding



Systems Analysis Activities

Gather Detailed Information	Interviews, questionnaires, documents, observing business processes, researching vendors, comments and suggestions
Define Requirements	Modeling **functional** requirements and **non-functional** requirements
Prioritize Requirements	Essential, important, vs. nice to have
Develop User-Interface Dialogs	Flow of interaction between user and system
Evaluate Requirements with Users	User involvement, feedback, adapt to changes

What Are Requirements?



System Requirements =

Functional requirements

Non-functional requirements



Functional Requirements– the activities the system must perform

Business uses, functions the users carry out

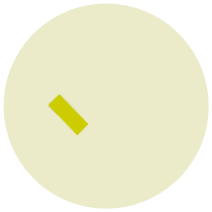
Use cases in Chapter 1



Non-Functional Requirements– other system characteristics

Constraints and performance goals

FURPS+ Requirements Acronym



Functional requirements



Usability requirements



Reliability requirements



Performance requirements



Security requirements



+ even more categories…

FURPS+ Requirements Acronym



Requirement categories	FURPS + categories	Example requirements
Functional	Functions	Business rules and processes
Nonfunctional	Usability	User interface, ease of use
	Reliability	Failure rate, recovery methods
	Performance	Response time, throughput
	Security	Access controls, encryption
	+ Design constraints	Hardware and support software
	Implementation	Development tools, protocols
	Interface	Data interchange formats
	Physical	Size, weight, power consumption
	Support	Installation and updates

Stakeholders

Who do you involve and talk to?



Stakeholders– persons who have an interest in the successful implementation of the system

Internal Stakeholders– persons within the organization

External stakeholders – persons outside the organization

Operational stakeholders – persons who regularly interact with the system

Executive stakeholders – persons who don't directly interact, but use the information or have financial interest

Stakeholders of a comprehensive accounting system for public company

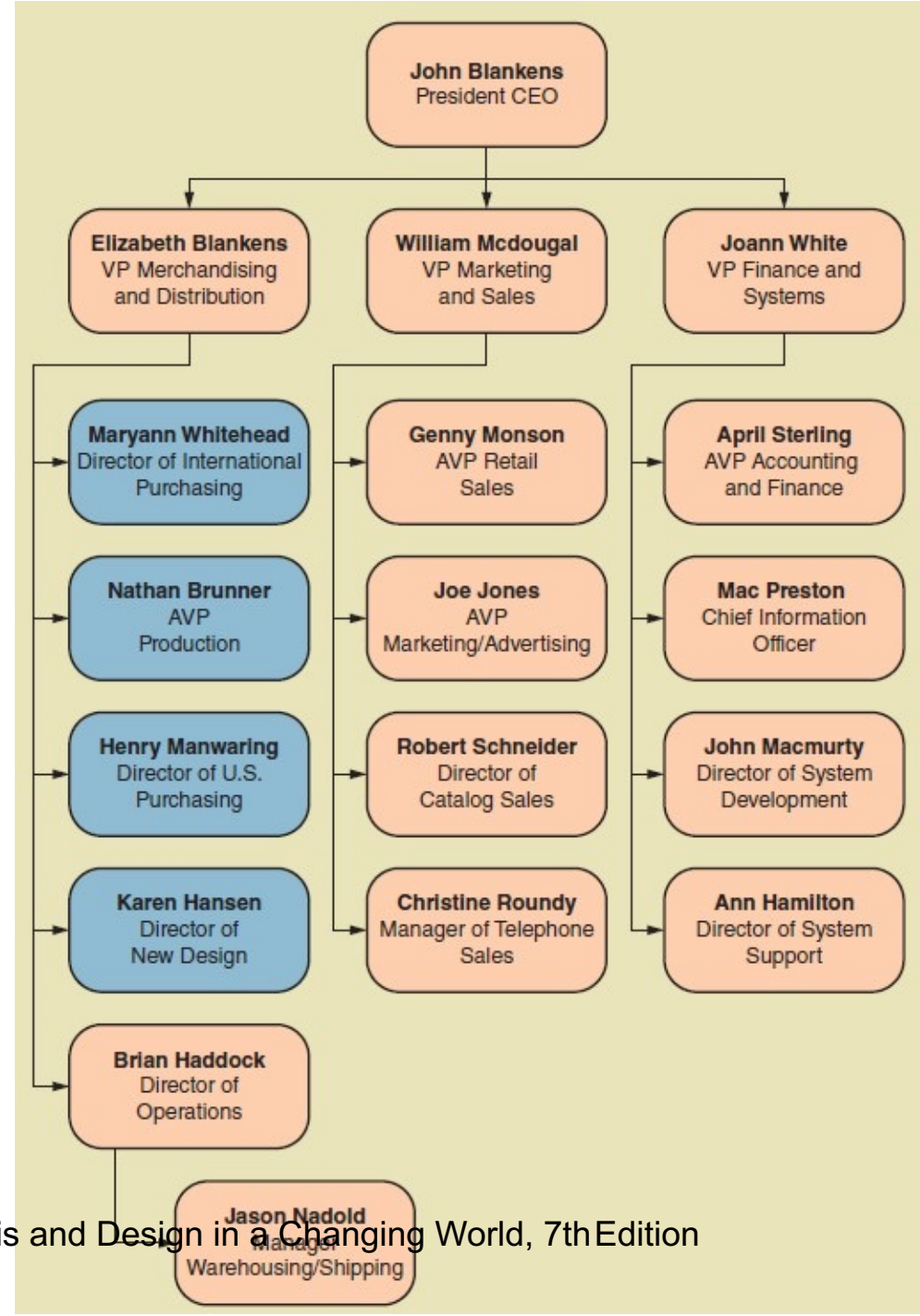


Stakeholders
For RMO Consolidated Sales and Marketing Project



- Phone/mail sales order clerks
- Warehouse and shipping personnel
- Marketing personnel who maintain online catalog information
- Marketing, sales, accounting, and financial managers
- Senior executives
- Customers
- External shippers (e.g., UPS and FedEx)

RMO Internal Stakeholders



Information Gathering Techniques



- Interviewing users and other stakeholders
- Distributing and collecting questionnaires
- Reviewing inputs, outputs, and documentation
- Observing and documenting business procedures
- Researching vendor solutions
- Collecting active user comments and suggestions

Interviewing Users and Other Stakeholders



- 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

Themes for Information Gathering Questions



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? How could they be done differently?
What information is needed to perform those operations?	What information do you use? What inputs do you use? What outputs do you produce?

Preparing for Interview

Checklist for Conducting an Interview

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.

During

- ❑ Arrive on time.
- ❑ Look for exception and error conditions.
- ❑ Probe for details.
- ❑ Take thorough notes.
- ❑ Identify and document unanswered items or open questions.

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.

Distribute and Collect Questionnaires

RMO Questionnaire

This questionnaire is being sent to all telephone-order sales personnel. As you know, RMO is developing a new customer support system for order taking and customer service.

The purpose of this questionnaire is to obtain preliminary information to assist in defining the requirements for the new system. Follow-up discussions will be held to permit everybody to elaborate on the system requirements.

Part I. Answer these questions based on a typical four-hour shift.

1. How many phone calls do you receive?_____
2. How many phone calls are necessary to place an order for a product?_____
3. How many phone calls are for information about RMO products, that is, questions only?_____
4. Estimate how many times during a shift customers request items that are out of stock._____
5. Of those out-of-stock requests, what percentage of the time does the customer desire to put the item on back order?_____%
6. How many times does a customer try to order from an expired catalog?_____
7. How many times does a customer cancel an order in the middle of the conversation?_____
8. How many times does an order get denied due to bad credit?_____

Part II. Circle the appropriate number on the scale from 1 to 7 based on how strongly you agree or disagree with the statement.

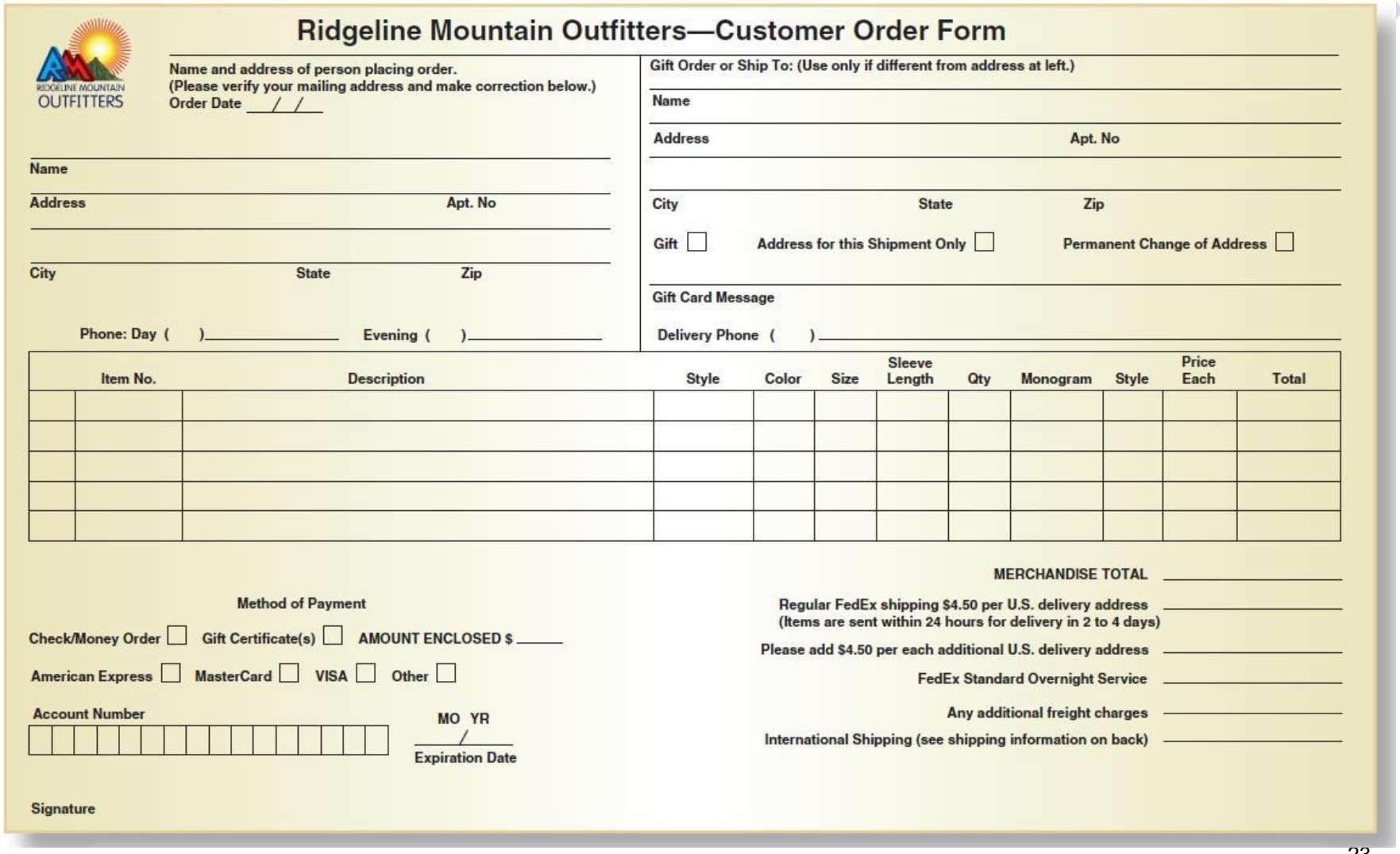
Question	Strongly Agree						Strongly Disagree
It would help me do my job better to have longer descriptions of products available while talking to a customer.	1	2	3	4	5	6	7
It would help me do my job better if I had the past purchase history of the customer available.	1	2	3	4	5	6	7
I could provide better service to the customer if I had information about accessories that were appropriate for the items ordered.	1	2	3	4	5	6	7
The computer response time is slow and causes difficulties in responding to customer requests.	1	2	3	4	5	6	7

Part III. Please enter your opinions and comments.

Please briefly identify the problems with the current system that you would like to see resolved in a new system.

_____
_____
_____

Review Inputs, Outputs, and Procedures



Ridgeline Mountain Outfitters—Customer Order Form

RIDGELINE MOUNTAIN OUTFITTERS

Name and address of person placing order.
(Please verify your mailing address and make correction below.)
Order Date ___/___/___

Name

Address Apt. No

City State Zip

Phone: Day ( ) Evening ( )

Gift Order or Ship To: (Use only if different from address at left.)

Name

Address Apt. No

City State Zip

Gift ☐ Address for this Shipment Only ☐ Permanent Change of Address ☐

Gift Card Message

Delivery Phone ( )

	Item No.	Description	Style	Color	Size	Sleeve Length	Qty	Monogram	Style	Price Each	Total

MERCHANDISE TOTAL

Regular FedEx shipping $4.50 per U.S. delivery address
(Items are sent within 24 hours for delivery in 2 to 4 days)

Please add $4.50 per each additional U.S. delivery address

FedEx Standard Overnight Service

Any additional freight charges

International Shipping (see shipping information on back)

Method of Payment

Check/Money Order ☐ Gift Certificate(s) ☐ AMOUNT ENCLOSED $ ____

American Express ☐ MasterCard ☐ VISA ☐ Other ☐

Account Number

MO YR
___/___
Expiration Date

Signature

Additional Techniques



- Observe and Document Business Processes
  - Watch and learn
  - Document with Activity diagram (next section)
- Research Vendor Solutions
  - See what others have done for similar situations
  - White papers, vendor literature, competitors
- Collect Active User Comments and Suggestions
  - Feedback on models and tests
  - Users know it when they see it

Models and Modeling

How do we define requirements?

After collecting information, create models

Model

It is a representation of some aspect of the system being built

Types of Models

Textual model– something written down, described

Graphical models– diagram, schematic

Mathematical models– formulas, statistics, algorithms

Unified Modeling Language (UML)

Standard graphical modeling symbols/terminology used for information systems



Reasons for Modeling

- Learning from the modeling process
- Reducing complexity by abstraction
- Remembering all the details
- Communicating with other development team members
- Communicating with a variety of users and stakeholders
- Documenting what was done for future maintenance/enhancement

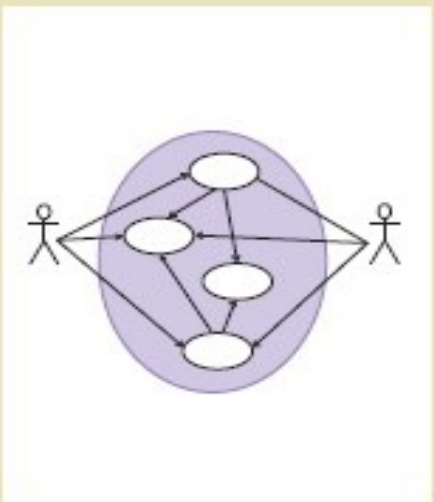


Some Analysis and Design Models





Event list



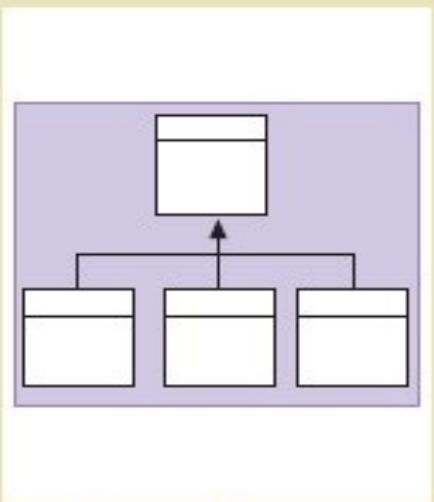
Use case diagram



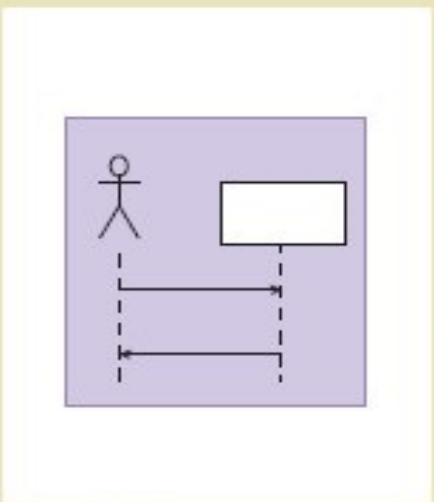
Use case description



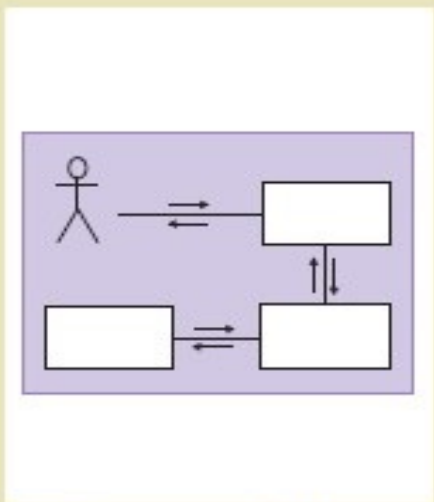
Location diagram



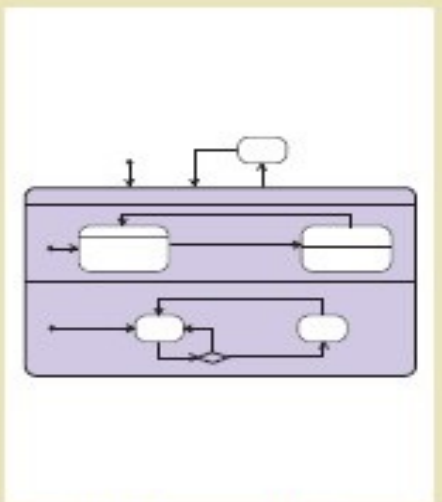
Class diagram



Sequence diagram



Communication diagram



State machine diagram

Documenting Workflows with Activity Diagrams

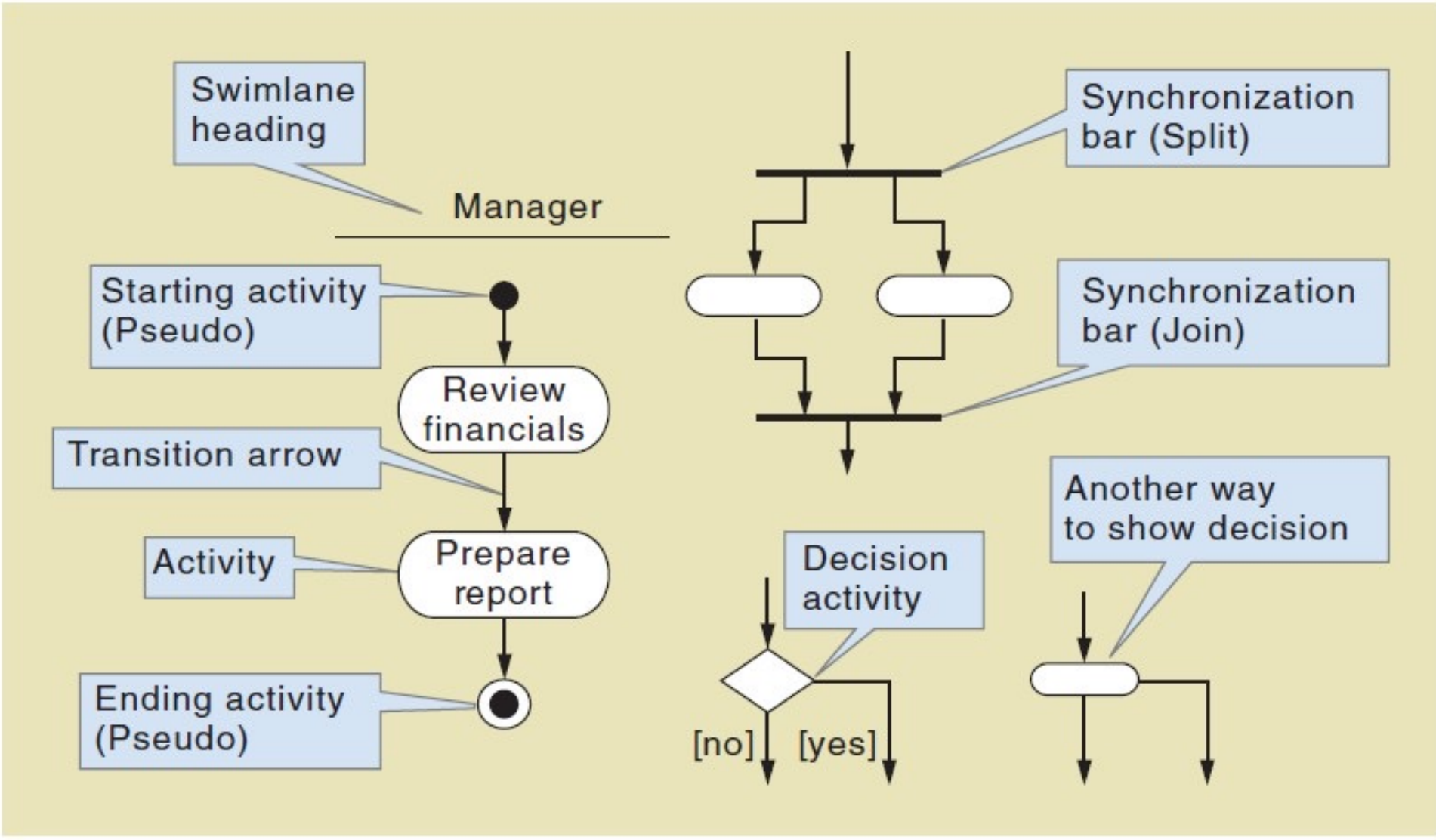


Workflow– sequence of processing steps that completely handles one business transaction or customer request

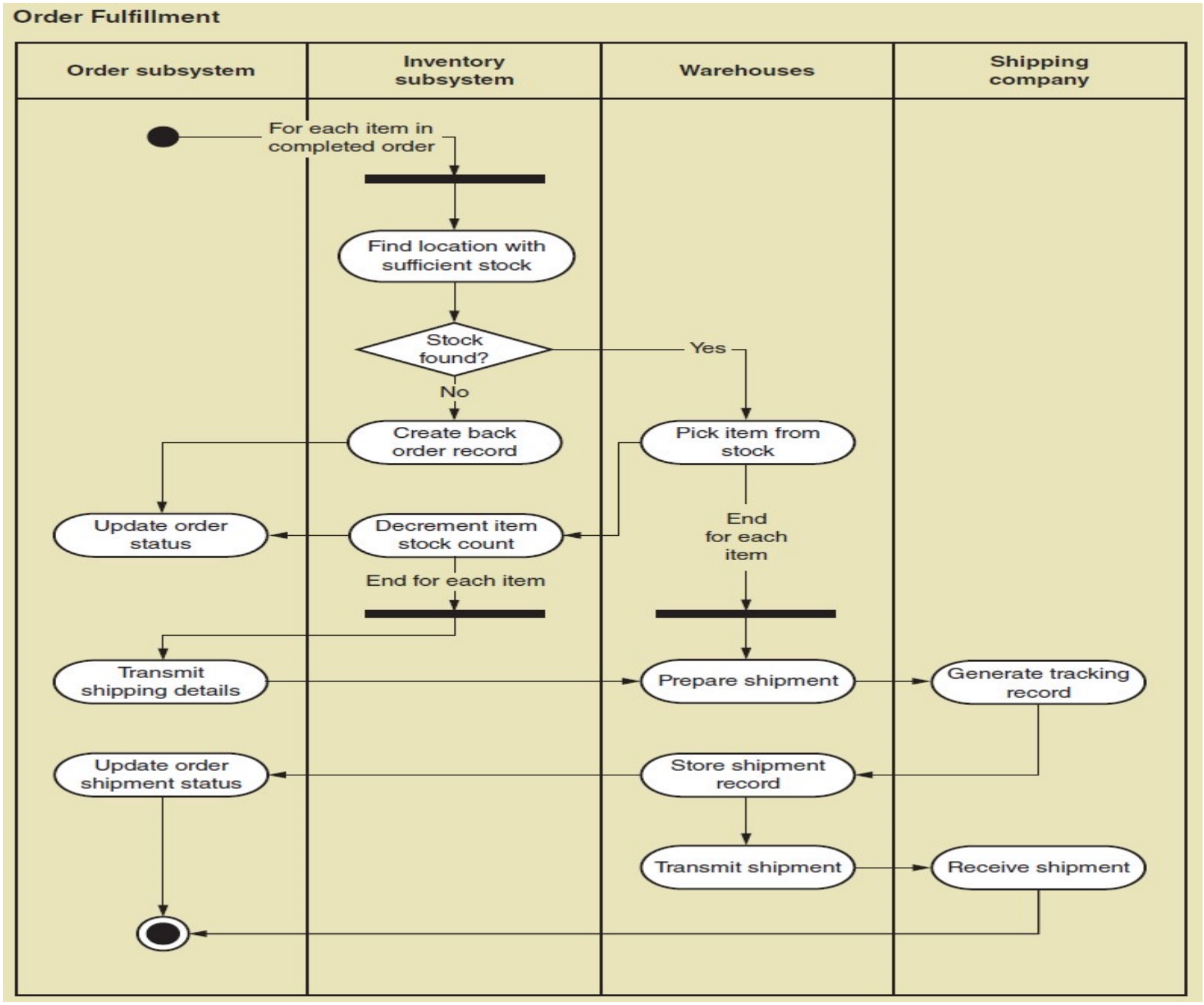
Activity Diagram– describes user (or system) activities, the person who does each activity, and the sequential flow of these activities

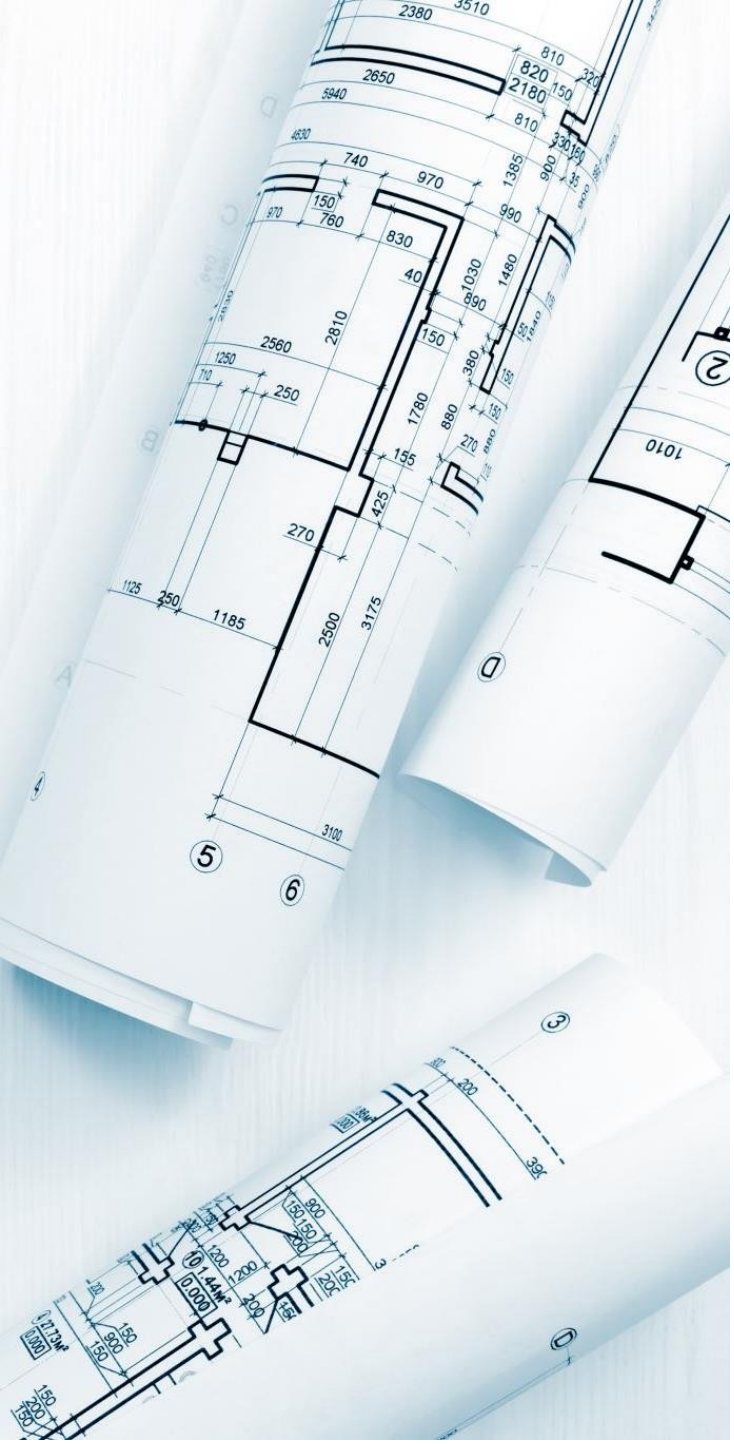
- Useful for showing a graphical model of a workflow
- A UML diagram

Activity Diagrams Symbols



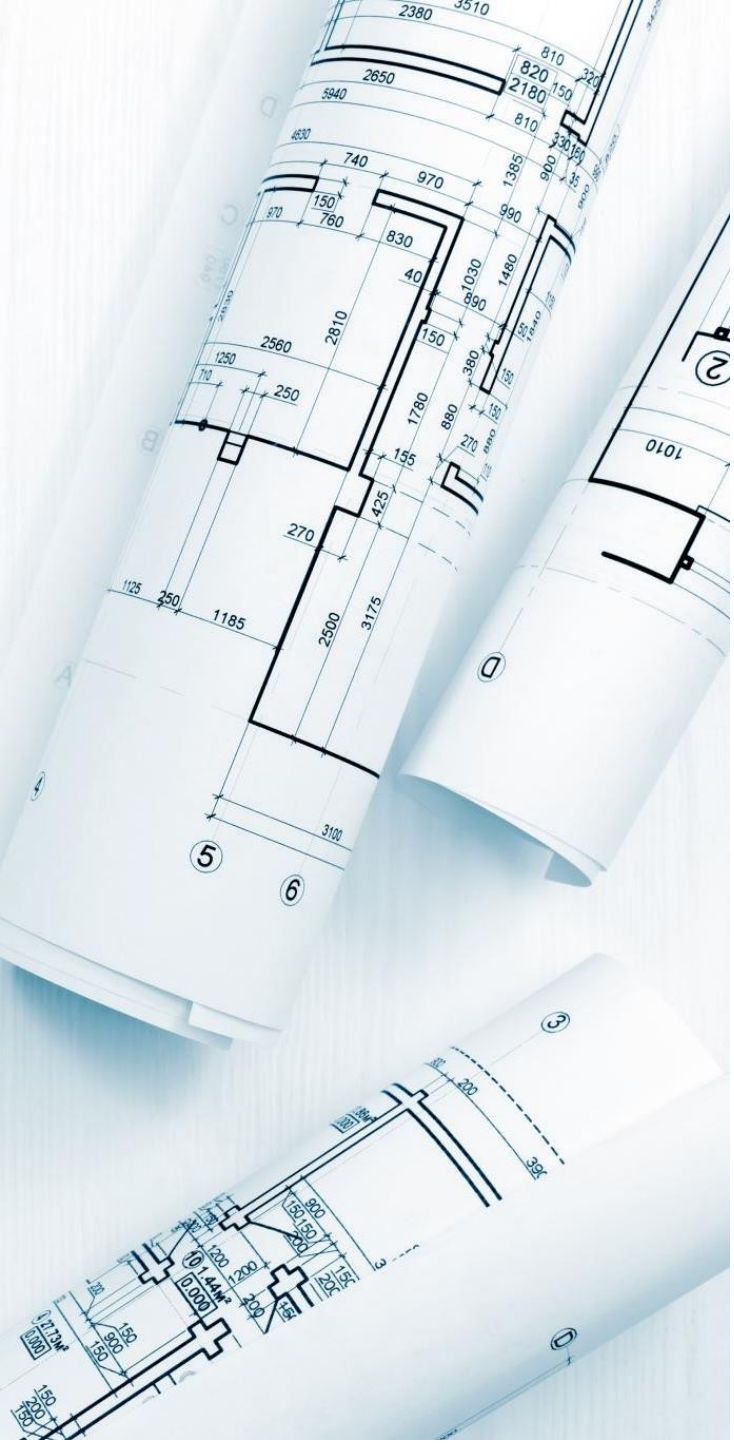
Activity Diagram for RMO Order Fulfillment





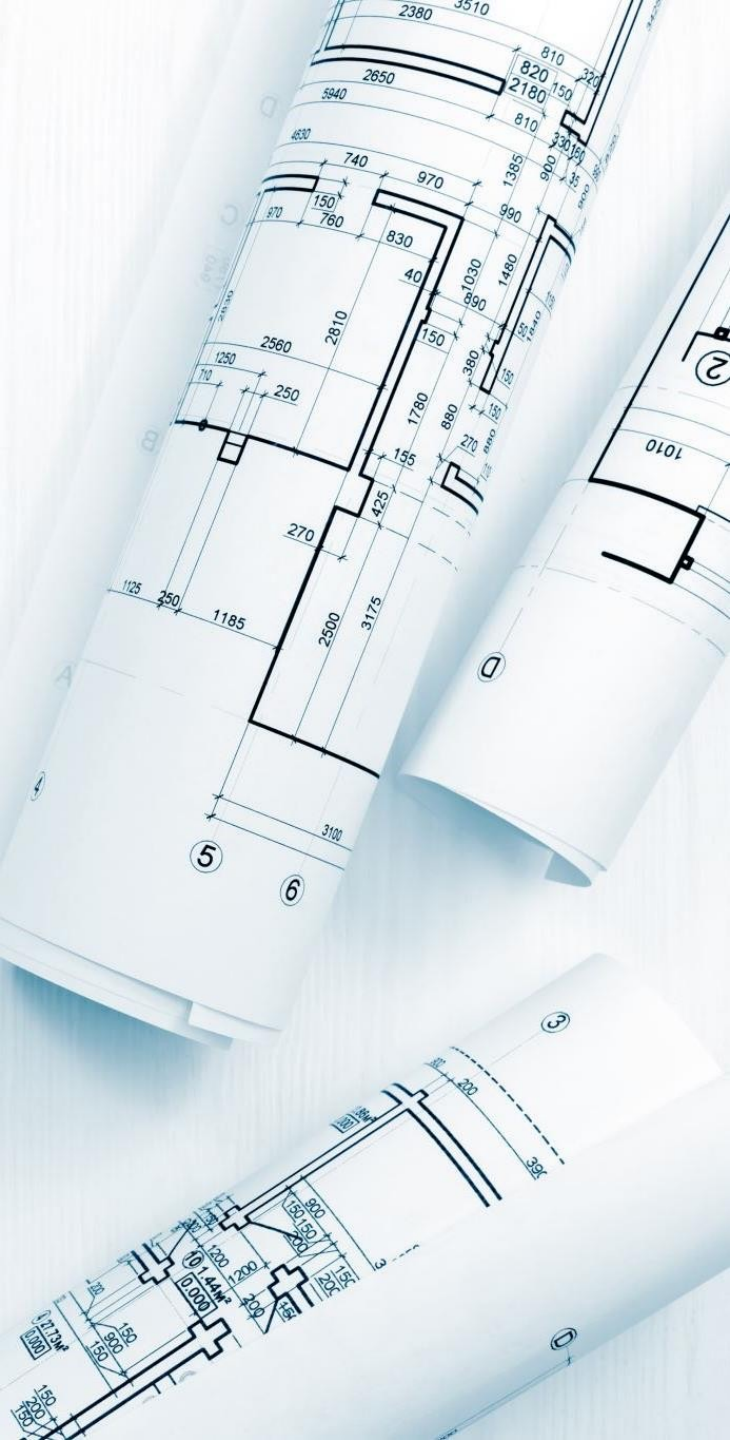
Summary

- Systems analysis activates correspond to the core SDLC process *Discover and understand details*
- System projects originate from the information system strategic plan, which contains an technology architecture plan and an application architecture plan
- The RMO CSMS Project will be used throughout the text as an example of analysis and design



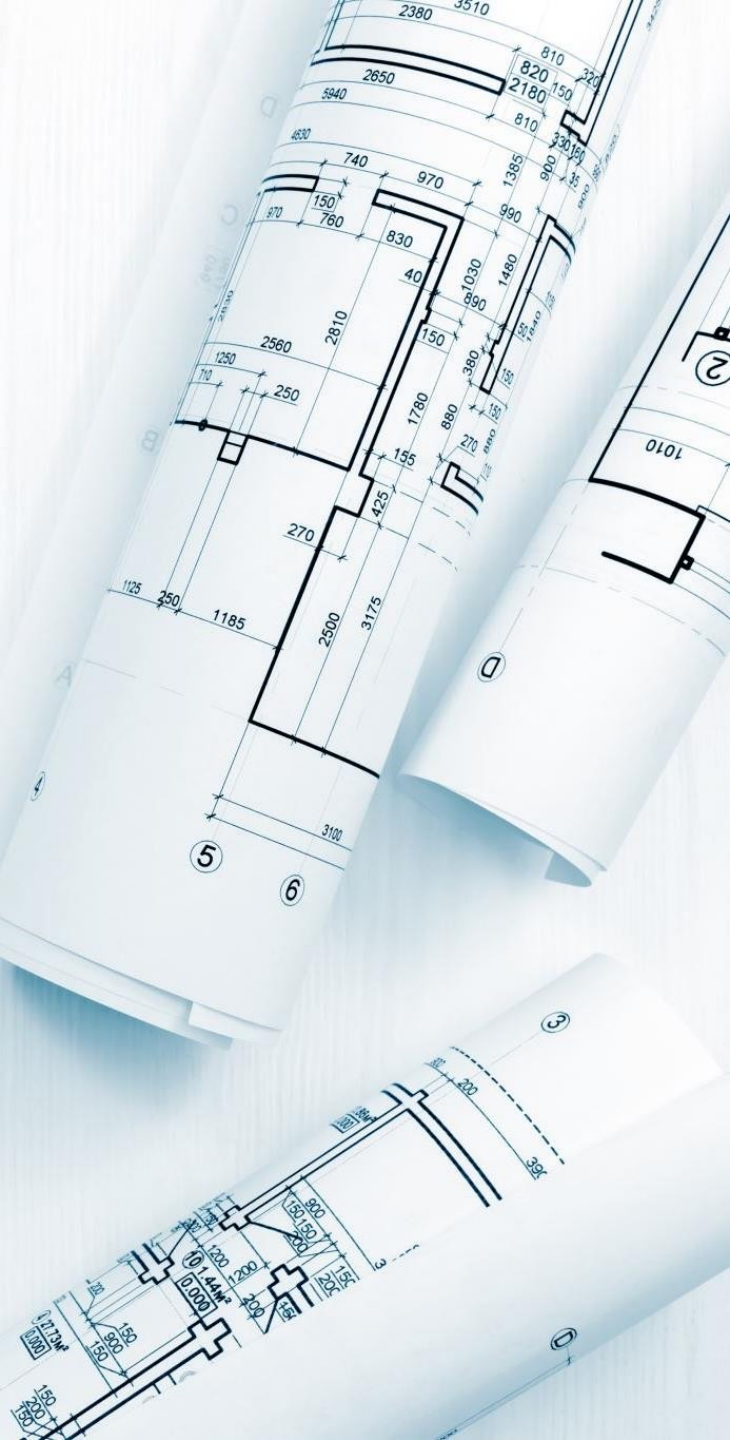
Summary

- Systems analysis involves defining system requirements– functional and non-functional
- Analysis activities include
  - Gather detailed information
  - Define requirements
  - Prioritize requirements
  - Develop user-interface dialogs
  - Evaluate requirements with users
- FURPS+ is the acronym for functional, usability, reliability, performance, and security requirements



Summary

- Models and modeling are used to explore and document requirements
- A model represents some aspect of a system, and can include textual, graphical, and mathematical models
- Unified Modeling Language (UML) is the standard set of notations and terminology for information systems models



Summary

Stakeholders are the people who have an interest in the success of the project

There are internal vs. external stakeholders and operational vs. executive stakeholders

Information gathering techniques are used to collect information about the project

- Interviews, questionnaires, reviewing documents, observing business processes, researching vendors, comments and suggestions

The UML Activity Diagram is used to document (model) workflows after collecting information

End of lecture



Prepare and surf chapter 3

Join groups and prepare for project



Course Code: IS332
Course: Analysis and Design of Information Systems

Thank you

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