PERTEMUAN 03. REKAYASA PERANGKAT LUNAK

ANALISIS SISTEM

PRODI SISTEM INFORMASI

Penyusun:
Angdy Erna, S.Kom., M.Si.
Abdul Kadir Jailani, S.Kom., M.T.

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Capaian yg Diharapkan dan Rubrik Penilaian (R6), Bobot 5

1. **CPL-6:** Mampu mengambil keputusan secara tepat dalam konteks penyelesaian masalah di bidang keahliannya, berdasarkan hasil analisis informasi dan data.
2. **CPMK-2:** Menguasai teknik dan alat-alat pengembangan perangkat lunak.
3. **SUB-CPMK3**: Mahasiswa mampu menjelaskan dan menerapkan fungsi-fungsi analisis sistem serta teknik pengumpulan data dan pemodelan kebutuhan sistem dengan menggunakan Use Case

Lampiran Rubrik R6 | Rubrik Penilaian Case Base Learning

Aspek	Skor dan Kriteria
Kesesuaian dengan materi	
* Sesuai dengan materi pembelajaran	4
* Cukup sesuai dengan materi pembelajaran	3
* Kurang sesuai dengan materi pembelajaran	2
* Tidak sesuai dengan materi pembelajaran	1
Analisis kasus	
* Mampu menganalisis kasus dengan tepat dan akurat	4
* Mampu menganalisis kasus dengan cukup tepat dan akurat	3
* Mampu menganalisis kasus dengan kurang tepat dan akurat	2
* Mampu menganalisis kasus dengan tidak tepat dan akurat	1
Pemecahan masalah	
* Mampu memberikan solusi yang tepat dan efektif untuk memecahkan masalah	4
* Mampu memberikan solusi yang cukup tepat dan efektif untuk memecahkan masalah	3
* Mampu memberikan solusi yang kurang tepat dan efektif untuk memecahkan masalah	2
* Mampu memberikan solusi yang tidak tepat dan efektif untuk memecahkan masalah	1
Komunikasi	
* Dapat menyajikan hasil analisis dan solusi dengan jelas, sistematis, dan menarik	4
* Dapat menyajikan hasil analisis dan solusi dengan cukup jelas, sistematis, dan menarik	3
* Dapat menyajikan hasil analisis dan solusi dengan kurang jelas, sistematis, dan menarik	2
* Tidak dapat menyajikan hasil analisis dan solusi dengan jelas, sistematis, dan menarik	1

2

Review Materi Sebelumnya…

1. Apa itu CMM?
2. SDLC dan Metodologinya apa saja?
3. Apa itu PIECES? Digunakan untuk apa?

3

Topik Pertemuan 3

1. Analisis Sistem, Pendekatan dan Fase-fase Analisis Sistem
2. Kebutuhan Fungsional dan Non Fungsional
3. Teknik-teknik Pengumpulan Data
4. Pengenalan Konsep Use Case dan Pemodelan Kebutuhan dengan Use Case

4

Tugas KULIAH ONLINE (tulis tangan → submit di SIKOLA)

Tulis penjelasan dari point-point berikut berdasarkan 5 buku refensi yang terdapat pada RPS matakuliah (lihat di SIKOLA):

1) Definisi analisis sistem
2) Pendekatan dalam analisis sistem
3) Fase-fase dalam analisis sistem Kebutuhan fungsional dan nonfungsional
4) Teknik-teknik pengumpulan data
5) Pengenalan konsep pemodelan dengan Use Case
6) Proses pemodelan kebutuhan dengan Use Case

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Definisi Analisis Sistem

System analysis is a problem-solving technique that decomposes a system into its component pieces for the purpose of studying how well those component parts work and interact to accomplish their purposes

Ilustrasi: Bayangkan sebuah mobil. Analisis sistem pada mobil akan melibatkan:

1. **Membongkar mobil:** Memisahkan mesin, roda, kemudi, dan komponen lainnya.
2. **Mempelajari setiap bagian:** Memahami fungsi setiap komponen, seperti bagaimana mesin mengubah bahan bakar menjadi tenaga.
3. **Melihat bagaimana bagian-bagian terhubung:** Memahami bagaimana mesin terhubung ke roda, bagaimana kemudi mengontrol arah, dan seterusnya.
4. **Menemukan masalah:** Jika ada bagian yang rusak atau tidak berfungsi dengan baik, kita bisa mengidentifikasinya.
5. **Mencari solusi:** Setelah menemukan masalah, kita bisa mencari cara untuk memperbaikinya atau menggantinya.

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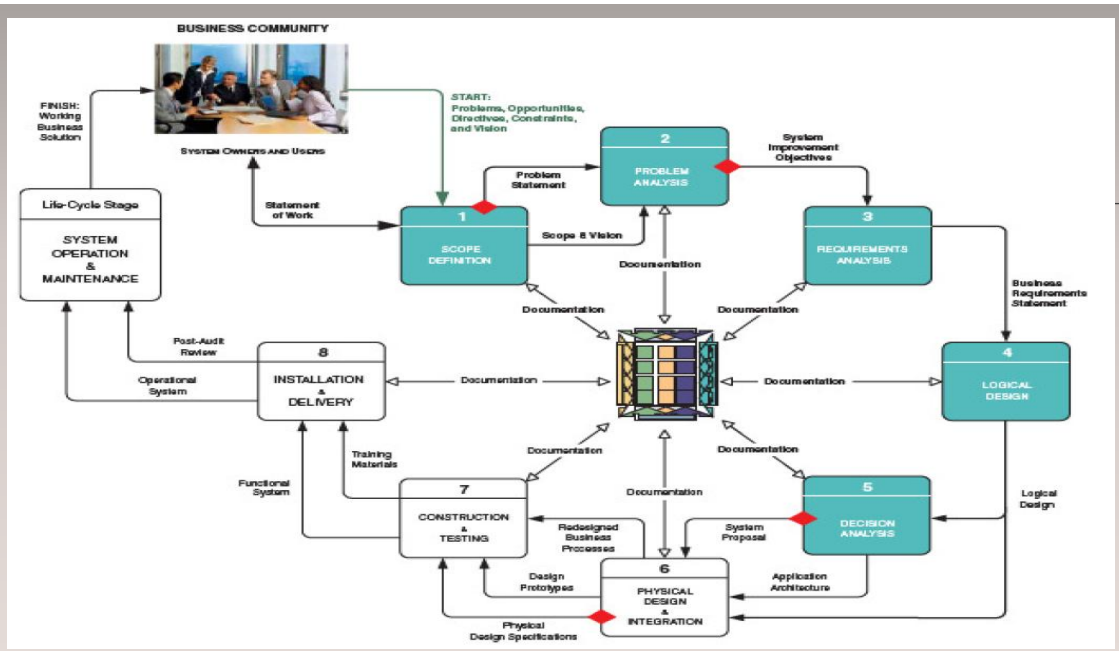

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System Analysis Approach

1. **Model Driven Analysis** Approaches menggunakan gambar untuk mengkomunikasikan problem bisnis, kebutuhan dan solusi → Structured Analysis, Information Engineering, Object-Oriented analysis
2. **Accelerated System Analysis** Approaches membangun prototipe untuk mengidentifikasi kebutuhan bisnis dan user → Discovery prototyping, Rapid architected development

Dependent

Kedua Pendekatan memerlukan **Requirements Discovery Methods** mengidentifikasi problem, peluang dan kebutuhan dari komunitas user → Fact-Finding Technique (Information Gathering), Joint Requirements Planning

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System Analysis Phases

1.1 Identify baseline problems and opportunities.
1.2 Negotiate baseline scope.
1.3 Assess baseline project worthiness.
1.4 Develop baseline schedule and budget.
1.5 Communicate the project plan.

3.1 Identify and express system requirements.
3.2 Prioritize system requirements.
3.3 Update or refine the project plan.
3.4 Communicate the requirements statement.

1 Scope Definition → 2 Problem Analysis → 3 Requirement Analysis → 4 Logical Design → 5 Decision Analysis

2.1 Understand the problem domain.
2.2 Analyze problems and opportunities.
2.3 Analyze business processes.
2.4 Establish system improvement objectives.
2.5 Update or refine the project plan.
2.6 Communicate findings and recommendations.

4.1a Structure functional requirements.
4.1b Prototype functional requirements.
4.2 Validate functional requirements.
4.3 Define acceptance test cases.

5.1 Identify candidate solutions.
5.2 Analyze candidate solutions.
5.3 Compare candidate solutions.
5.4 Update the project plan.
5.5 Recommend a system solution.

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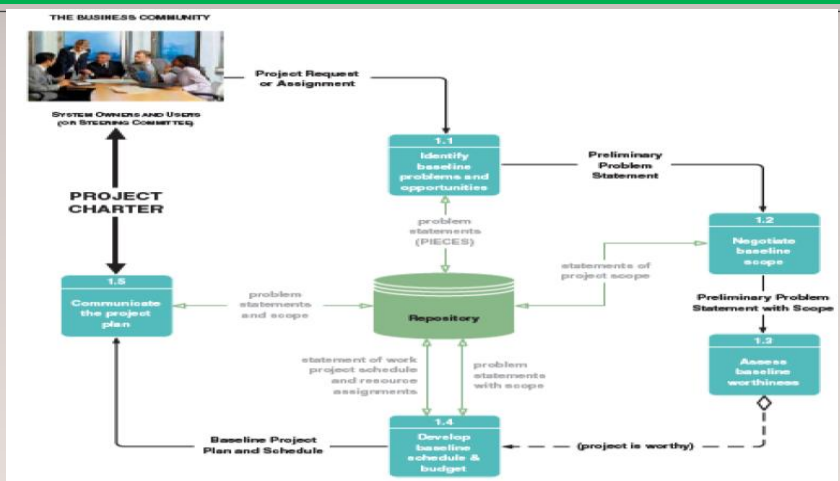
1 Scope Definition → Problem Analysis → Requirement Analysis → Logical Design → Decision Analysis



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1 Scope Definition → Problem Analysis → Requirement Analysis → Logical Design → Decision Analysis

SoundStage Entertainment Club
Information System Services
Phone: 494-0000 Fax: 494-0060
Internet: http://www.soundstage.com
Intranet: http://www.soundstage.com/iss

REQUEST FOR INFORMATION SYSTEM SERVICES

DATE OF REQUEST	SERVICE REQUESTED FOR DEPARTMENT(S)
January 9, 2003	Member Services, Warehouse, Shipping

SUBMITTED BY (key user contact)
Name: Sarah Hartman
Title: Business Analyst, Member Services
Office: B035
Phone: 494-0987

EXECUTIVE SPONSOR (funding authority)
Name: Galen Kirkhoff
Title: Vice President, Member Services
Office: G242
Phone: 494-1242

TYPE OF SERVICE REQUESTED:
- ☐ Information Strategy Planning
- ☒ Business Process Analysis and Redesign
- ☒ New Application Development
- ☐ Other (please specify)
- ☐ Existing Application Enhancement
- ☐ Existing Application Maintenance (problem fix)
- ☐ Not Sure

BRIEF STATEMENT OF PROBLEM, OPPORTUNITY, OR DIRECTIVE (attach additional documentation as necessary)
The information strategy planning group has targeted member services, marketing, and order fulfillment (inclusive of shipping) for business process redesign and integrated application development. Currently serviced by separate information systems, these areas are not well integrated to maximize efficient order services to our members. The current systems are not adaptable to our rapidly changing products and services. In some cases, separate systems exist for similar products and services. Some of these systems were inherited through mergers that expanded our products and services. There also exist several marketing opportunities to increase our presence to our members. One example includes Internet commerce services. Finally, the automatic identification system being developed for the warehouse must fully interoperate with member services.

BRIEF STATEMENT OF EXPECTED SOLUTION
We envision completely new and streamlined business processes that minimize the response time to member orders for products and services. An order shall not be considered fulfilled until it has been received by the member. The new system should provide for expanded club and member flexibility and adaptability of basic business products and services.
We envision a system that extends to the desktop computers of both employees and members, with appropriate shared services provided across the network, consistent with the ISS distributed architecture. This is consistent with strategic plans to retire the AS/400 central computer and replace it with servers.

ACTION (ISS Office Use Only)
- ☐ Feasibility assessment approved
- ☒ Feasibility assessment waived
- ☐ Request delayed
- ☐ Request rejected

Assigned to: Sandra Shepherd
Approved Budget: $ 450,000
Start Date: ASAP Deadline: ASAP
Backlogged until date:
Reason:

Authorized Signatures:
Rebecca J. Todd — Chair, ISS Executive Steering Body
Galen Kirkhoff — Project Executive Sponsor

FORM ISS-100.RFIS (Last revised December, 1999)

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1 Scope Definition → Problem Analysis → Requirement Analysis → Logical Design → Decision Analysis

Problem Statements

Project: Member services information system	Project manager: Sandra Shepherd
Created by: Sandra Shepherd	Last updated by: Robert Martinez
Date created: January 9, 2003	Date last updated: January 15, 2003

Brief Statements of Problem, Opportunity, or Directive	Urgency	Visibility	Annual Benefits	Priority or Rank	Proposed Solution
1. Order response time as measured from time of order receipt to time of customer delivery has increased to an average of 15 days.	ASAP	High	$175,000	2	New development
2. The recent acquisitions of Private Screenings Video Club and GameScreen will further stress the throughput requirements for the current system.	6 months	Med	75,000	2	New development
3. Currently, three different order entry systems service the audio, video, and game divisions. Each system is designed to interface with a different warehousing system, therefore, the intent to merge inventory into a single warehouse has been delayed.	6 months	Med	515,000	2	New development
4. There is a general lack of access to management and decision-making information. This will become exasperated by the acquisition of two additional order processing systems (from Private Screenings and GameScreen).	12 months	Low	15,000	3	After new system is developed, provide users with easy-to-learn and -use reporting tools.
5. There currently exist data inconsistencies in the member and order files.	3 months	High	35,000	1	Quick fix; then new development
6. The Private Screenings and GameScreen file systems are incompatible with the SoundStage equivalents. Business data problems include data inconsistencies and lack of input edit controls.	6 months	Med	Unknown	2	New development. Additional quantification of benefit might increase urgency.
7. There is an opportunity to open order systems to the Internet, but security and control are an issue.	12 months	Low	Unknown	4	Future version of newly developed system
8. The current order entry system is incompatible with the forthcoming automatic identification (bar-coding)	3 months	High	65,000	1	Quick fix; then new development

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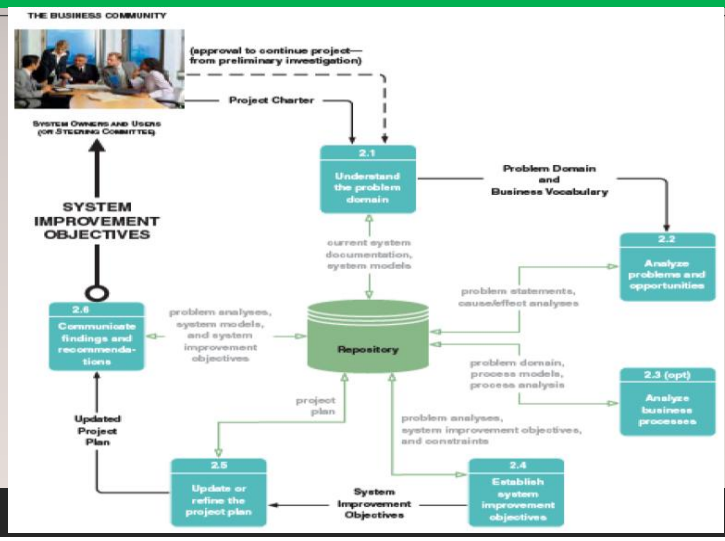
Scope Definition | 2 Problem Analysis | Requirement Analysis | Logical Design | Decision Analysis



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Scope Definition | 2 Problem Analysis | Requirement Analysis | Logical Design | Decision Analysis

PROBLEMS, OPPORTUNITIES, OBJECTIVES, AND CONSTRAINTS MATRIX

Project:	Member Services Information System	Project Manager:	Sandra Shepherd
Created by:	Robert Martinez	Last Updated by:	Robert Martinez
Date Created:	January 21, 2003	Date Last Updated:	January 31, 2003

CAUSE-AND-EFFECT ANALYSIS		SYSTEM IMPROVEMENT OBJECTIVES	
Problem or Opportunity	**Causes and Effects**	**System Objective**	**System Constraint**
1. Order response time is unacceptable.	1. Throughput has increased while number of order clerks was downsized. Time to process a single order has remained relatively constant. 2. System is too keyboard-dependent. Many of the same values are keyed for most orders. Net result is (with the current system) each order takes longer to process than is ideal. 3. Data editing is performed by the AS/400. As that computer has approached its capacity, order edit responses have slowed. Because order clerks are trying to work faster to keep up with the volume, the number of errors has increased. 4. Warehouse picking tickets for orders were never designed to maximize the efficiency of order fillers. As warehouse operations grew, order filling delays were inevitable.	1. Decrease the time required to process a single order by 30%. 2. Eliminate keyboard data entry for as much as 50% of all orders. 3. For remaining orders, reduce as many key-strokes as possible by replacing keystrokes with point-and-click objects on the computer display screen. 4. Move data editing from a shared computer to the desktop. 5. Replace existing picking tickets with a paperless communication system between member services and the warehouse.	1. There will be no increase in the order processing workforce. 2. Any system developed must be compatible with the existing Windows 95 desktop standard. 3. New system must be compatible with the already approved automatic identification system (for bar coding).

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Scope Definition → 2 Problem Analysis → Requirement Analysis → Logical Design → Decision Analysis

FIGURE 5-13 An Outline for a System Improvement Objectives and Recommendations Report

Analysis of the Current _____ System

I. Executive summary (approximately 2 pages)
   A. Summary of recommendation
   B. Summary of problems, opportunities, and directives
   C. Brief statement of system improvement objectives
   D. Brief explanation of report contents
II. Background information (approximately 2 pages)
   A. List of interviews and facilitated group meetings conducted
   B. List of other sources of information that were exploited
   C. Description of analytical techniques used
III. Overview of the current system (approximately 5 pages)
   A. Strategic implications (if the project is part of or impacts an existing information systems strategic plan)
   B. Models of the current system
      1. Interface model (showing project scope)
      2. Data model (showing project scope)
      3. Geographic models (showing project scope)
      4. Process model (showing functional decomposition only)
IV. Analysis of the current system (approximately 5–10 pages)
   A. Performance problems, opportunities, and cause-effect analysis
   B. Information problems, opportunities, and cause-effect analysis
   C. Economic problems, opportunities, and cause-effect analysis
   D. Control problems, opportunities, and cause-effect analysis
   E. Efficiency problems, opportunities, and cause-effect analysis
   F. Service problems, opportunities, and cause-effect analysis
V. Detailed recommendations (approximately 5–10 pages)
   A. System improvement objectives and priorities
   B. Constraints
   C. Project plan
      1. Scope reassessment and refinement
      2. Revised master plan
      3. Detailed plan for the definition phase
VI. Appendixes
   A. Any detailed system models
   B. Other documents as appropriate

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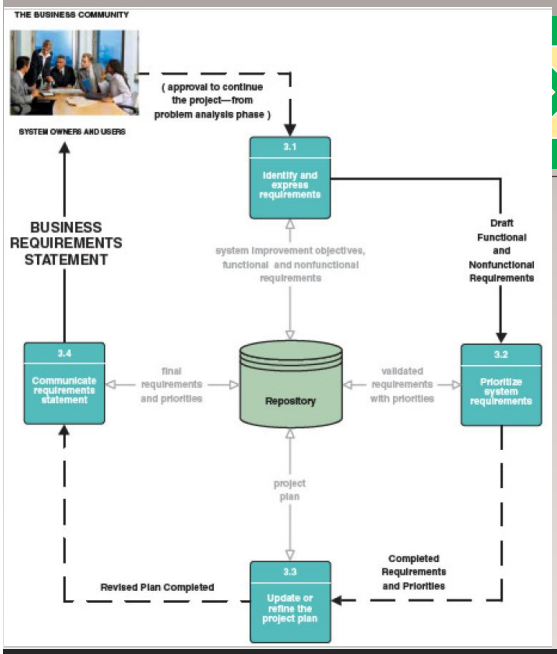

3 Requirement Analysis → Logical Design → Decision Analysis

REQUIREMENTS WITH PRIORITIES. Priorities can be classified according to their relative importance:

- A *mandatory requirement* is one that must be fulfilled by the minimal system, version 1.0. The system is useless without it. Careful! There is a temptation to label too many requirements as mandatory. A mandatory requirement cannot be ranked because it is essential to any solution. In fact, if an alleged mandatory requirement can be ranked, it is actually a desirable requirement.
- A *desirable requirement* is one that is not absolutely essential to version 1.0. It may still be essential to the vision of some future version. Desirable requirements can and should be ranked. Using version numbers as the ranking scheme is an effective way to communicate and categorize desirable requirements.

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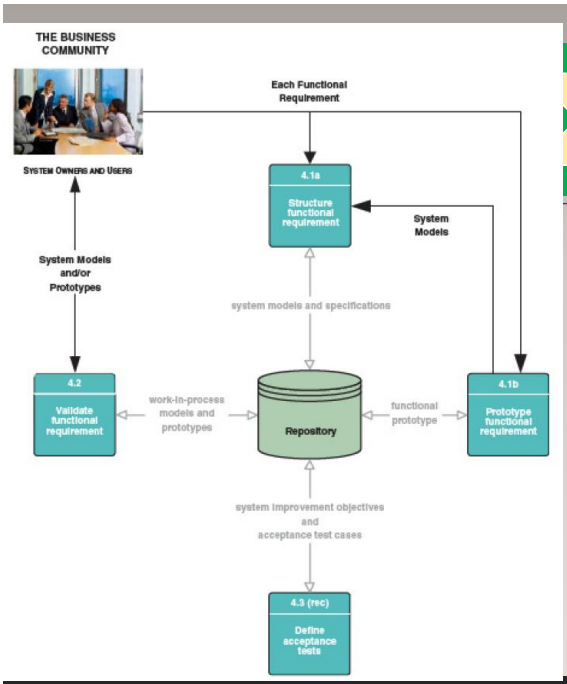

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Requirement Analysis → Logical Design → Decision Analysis

> Task 4.2—Validate Functional Requirements

Both SYSTEM MODELS and PROTOTYPES are representations of the users' requirements. They must be validated for completeness and correctness. SYSTEMS ANALYSTS facilitate the prioritization task by interactively engaging system users to identify errors and omissions or make clarifications.

> Task 4.3—Define Acceptance Test Cases

While not a required task, most experts agree that it is not too early to begin planning for system testing. System models and prototypes very effectively define the processing requirements, data rules, and business rules for the new system. Accordingly, these specifications can be used to define TEST CASES that can ultimately be used to test programs for correctness. Either SYSTEM ANALYSTS or SYSTEM BUILDERS can perform this task and validate the test cases with the SYSTEM USERS.

Recall that SYSTEM IMPROVEMENT OBJECTIVES were defined earlier in the project. Test cases can be defined to test these objectives as well.

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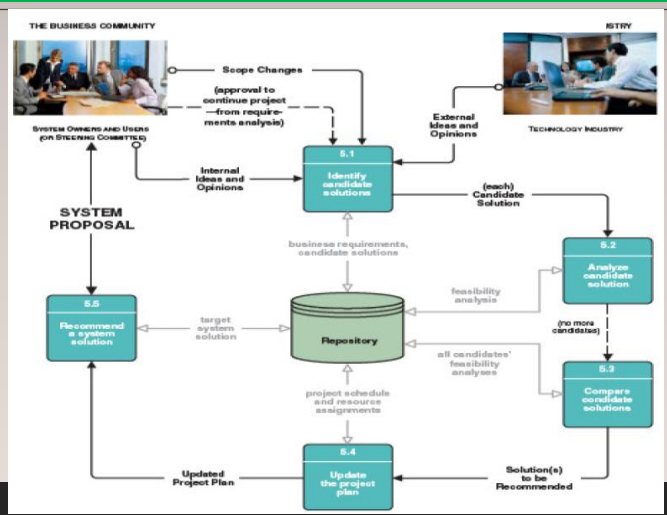
Scope Definition → Problem Analysis → Requirement Analysis → Logical Design → 5 Decision Analysis



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Scope Definition

5 Decision Analysis

FIGURE 5-20 A Candidate Systems Matrix

Characteristics	Candidate 1	Candidate 2	Candidate 3	Candidate . . .
Portion of System Computerized Brief description of that portion of the system that would be computerized in this candidate.	COTS package Platinum Plus from Entertainment Software Solutions would be purchased and customized to satisfy Member Services required functionality.	Member Services and warehouse operations in relation to order fulfillment.	Same as candidate 2.	
Benefits Brief description of the business benefits that would be realized for this candidate.	This solution can be implemented quickly because it's a purchased solution.	Fully supports user's required business processes for SoundStage Inc. Plus more efficient interaction with member accounts.	Same as candidate 2.	
Servers and Workstations A description of the servers and workstations needed to support this candidate.	Technically, architecture dictates Pentium Pro, MS Windows NT class servers and Pentium, MS Windows NT 4.0 workstations (clients).	Same as candidate 1.	Same as candidate 1.	
Software Tools Needed Software tools needed to design and build the candidate (e.g., database management system, emulators, operating systems, languages, etc.). Not generally applicable if applications software packages are to be purchased.	MS Visual C++ and MS Access for customization of package to provide report writing and integration.	MS Visual Basic 5.0 System Architect 3.1 Internet Explorer	MS Visual Basic 5.0 System Architect 3.1 Internet Explorer	
Application Software A description of the software to be purchased, built, accessed, or some combination of these techniques.	Package solution.	Custom solution	Same as candidate 2.	
Method of Data Processing Generally some combination of online, batch, deferred batch, remote batch, and real time.	Client/server.	Same as candidate 1.	Same as candidate 1.	
Output Devices and Implications A description of output devices that would be used, special output requirements (e.g., network, preprinted forms, etc.), and output considerations (e.g., timing constraints).	(2) HP4MV department laser printers. (2) HPSSI LAN laser printers.	(2) HP4MV department laser printers. (2) HPSSI LAN laser printers. (1) PRINTRONIX bar code printer (includes software & drivers). Web pages must be designed to VGA resolution. All internal screens will be designed for SVGA resolution.	Same as candidate 2.	
Input Devices and Implications A description of input methods to be used, input devices (keyboard, mouse, etc.), special input requirements (e.g., new or revised forms from which data would be input), and input considerations (e.g., timing of actual inputs).	Keyboard & mouse.	Apple "Quick Take" digital camera and software. (1.5) PSC Quickscan laser bar code scanners. (1) HP Scanjet 4C flatbed scanner. Keyboard & mouse.	Same as candidate 2.	
Storage Devices and Implications Brief descriptions of what data would be stored, what data would be accessed from existing stores, what storage media would be used, how much storage capacity would be needed, and how data would be organized.	MS SQL Server DBMS with 100GB arrayed capability.	Same as candidate 1.	Same as candidate 1.	

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Scope Definition

5 Decision Analysis

FIGURE 5-21 A Feasibility Analysis Matrix

Feasibility Criteria	Weight	Candidate 1	Candidate 2	Candidate 3	Candidate . . .
Operational Feasibility **Functionality.** A description of to what degree the candidate would benefit the organization and how well the system would work. **Political.** A description of how well received this solution would be from user management, user, and organization perspectives.	30%	Only supports Member Services requirements, and current business processes would have to be modified to take advantage of software functionality. **Score: 60**	Fully supports user's required functionality. **Score: 100**	Same as candidate 2. **Score: 100**	
Technical Feasibility **Technology.** An assessment of the maturity, availability (or ability to acquire), and desirability of the computer technology needed to support this candidate. **Expertise.** An assessment of the technical expertise needed to develop, operate, and maintain the candidate system.	30%	Current production release of Platinum Plus package is version 1.0 and has been on the market for only 6 weeks. Maturity of product is a risk, and company charges an additional monthly fee for technical support. Required to hire or train C++ expertise to perform modifications for integration requirements. **Score: 50**	Although current technical staff has only Powerbuilder experience, the senior analysts who saw the MS Visual Basic demonstration and presentation have agreed the transition will be simple and finding experienced VB programmers will be easier than finding Powerbuilder programmers and at a much cheaper cost. MS Visual Basic 5.0 is a mature technology based on version number. **Score: 95**	Although current technical staff is comfortable with Powerbuilder, management is concerned with recent acquisition of Powerbuilder by Sybase Inc. MS SQL Server is a current company standard and competes with SYBASE in the client/server DBMS market. Because of this we have no guarantee future versions of Powerbuilder will "play well" with our current version SQL Server. **Score: 60**	
Economic Feasibility **Cost to develop:** **Payback period (discounted):** **Net present value:** **Detailed calculations:**	30%	Approximately $350,000. Approximately 4.5 years. Approximately $210,000. See Attachment A. **Score: 60**	Approximately $418,040. Approximately 3.5 years. Approximately $306,748. See Attachment A. **Score: 85**	Approximately $400,000. Approximately 3.3 years. Approximately $325,500. See Attachment A. **Score: 90**	
Schedule Feasibility An assessment of how long the solution will take to design and implement.	10%	Less than 3 months. **Score: 95**	9–12 months. **Score: 80**	9 months. **Score: 85**	
Ranking	100%	60.5	92	83.5	

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Scope Definition → 5 Decision Analysis

UNIVERSITAS HASANUDDIN
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM
PROGRAM STUDI SISTEM INFORMASI - S1

Rencana Tugas Mahasiswa

MATAKULIAH	Rekayasa Perangkat Lunak				
KODE	23H07120503	sks	3	Semester	3
DOSEN PENGAMPUH	1. Dr. Armin Lawi, S.Si.,M.Si. (197204231995121001) 2. Dr. Hendra, S.Si., M.Kom. (197601022002121001) 3. Ir. Eliyah Acantha Manapa Sampetoding, S.Kom., M.Kom (3273221911910006)				

BENTUK TUGAS	WAKTU PENGERJAAN TUGAS
Case Based: Tugas Besar MID	Pertemuan Ke 5 - 8

JUDUL TUGAS

Rancang Bangun Sistem Informasi Sederhana

SUB CAPAIAN PEMBELAJARAN MATA KULIAH

SUB-CPMK-3: Mahasiswa mampu menjelaskan dan menerapkan fungsi-fungsi analisis sistem serta teknik pengumpulan data dan pemodelan kebutuhan sistem dengan menggunakan Use Case.

SUB-CPMK-4: Mahasiswa mampu menjelaskan dan menerapkan konsep perancangan dan arsitektur sistem informasi.

SUB-CPMK-5: Mahasiswa mampu melakukan analisis dan pemodelan alur data.

DESKRISPI TUGAS

Buatlah rancang bangun sistem informasi sederhana dengan memperhatikan hal-hal berikut:

1. Jenis sistem informasi dan stakeholder yang terlibat
2. Proses pengembangan sistem informasi
3. Use Case diagram
4. Rancangan dan Arsitektur Sistem Informasi
5. Analisis dan Pemodelan Alur Data

METODE PENGERJAAN TUGAS

Tugas Mandiri

BENTUK DAN FORMAT LUARAN

Makalah

INDIKATOR, KRITERIA DAN BOBOT PENILAIAN

Sesuai rubrik penilaian Rubrik Penilaian Case Base Learning (R6)

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Scope Definition → Problem Analysis → Requirement Analysis → Logical Design → 5 Decision Analysis

FIGURE 5-22 An Outline for a Typical System Proposal

I. Introduction
   A. Purpose of the report
   B. Background of the project leading to this report
   C. Scope of the project
   D. Structure of the report
II. Tools and techniques used
   A. Solution generated
   B. Feasibility analysis (cost-benefit)
III. Information systems requirements
IV. Alternative solutions and feasibility analysis
V. Recommendations
VI. Appendixes

FAST Phases	Classic Phases			
	Project Initiation	System Analysis	System Design	System Implementation
Scope definition	X			
Problem analysis	X	X		
Requirements analysis		X		
Logical design		X		
Decision analysis	(a system analysis transition phase)			
Physical design and integration			X	
Construction and testing			X	X
Installation and delivery				X

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Kebutuhan Fungsional dan Non-Fungsional

Kebutuhan Fungsional

Kebutuhan fungsional adalah persyaratan yang menjelaskan **apa** yang harus dilakukan oleh sistem. Dengan kata lain, kebutuhan ini mendefinisikan fitur-fitur dan fungsi-fungsi spesifik yang harus dimiliki oleh sistem.

Kebutuhan fungsional menjawab pertanyaan:

- Apa yang harus dilakukan sistem?
- Bagaimana pengguna berinteraksi dengan sistem?
- Data apa yang akan diproses oleh sistem?

- **Contoh:**
  - Sistem perpustakaan harus dapat meminjamkan buku.
  - Aplikasi e-commerce harus dapat memproses pembayaran.
  - Sistem manajemen inventori harus dapat melacak stok barang.

Kebutuhan Non-Fungsional

Kebutuhan non-fungsional adalah persyaratan yang menjelaskan **bagaimana** sistem harus bekerja. Kebutuhan ini berkaitan dengan kualitas, kinerja, dan karakteristik lain dari sistem yang tidak secara langsung terkait dengan fitur-fiturnya.

Kebutuhan non-fungsional menjawab pertanyaan:

- Seberapa cepat sistem harus merespon?
- Seberapa aman sistem?
- Seberapa mudah sistem digunakan?
- Berapa kapasitas sistem?

- **Contoh:**
  - Sistem harus dapat diakses dalam waktu 2 detik.
  - Sistem harus memiliki tingkat keamanan yang tinggi.
  - Sistem harus mudah digunakan.
  - Sistem harus kompatibel dengan berbagai jenis perangkat.

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TABLE 6-1 PIECES Classification of System Requirements

Nonfunctional Requirement Type	Explanation
Performance	Performance requirements represent the performance the system is required to exhibit to meet the needs of users. • What is the acceptable throughput rate? • What is the acceptable response time?
Information	Information requirements represent the information that is pertinent to the users in terms of content, timeliness, accuracy, and format. • What are the necessary inputs and outputs? When must they happen? • What is the required data to be stored? • How current must the information be? • What are the interfaces to external systems?
Economy	Economy requirements represent the need for the system to reduce costs or increase profits. • What are the areas of the system where costs must be reduced? • How much should costs be reduced or profits be increased? • What are the budgetary limits? • What is the timetable for development?
Control (and security)	Control requirements represent the environment in which the system must operate, as well as the type and degree of security that must be provided. • Must access to the system or information be controlled? • What are the privacy requirements? • Does the criticality of the data necessitate the need for special handling (backups, off-site storage, etc.) of the data?
Efficiency	Efficiency requirements represent the system's ability to produce outputs with minimal waste. • Are there duplicate steps in the process that must be eliminated? • Are there ways to reduce waste in the way the system uses it resources?
Service	Service requirements represent needs in order for the system to be reliable, flexible, and expandable. • Who will use the system, and where are they located? • Will there be different types of users? • What are the appropriate human factors? • What training devices and training materials are to be included in the system? • What training devices and training materials are to be developed and maintained separately from the system, such as stand-alone computer-based training (CBT) programs or databases? • What are the reliability/availability requirements? • How should the system be packaged and distributed? • What documentation is required?

Analisis Kebutuhan Non-Fungsional dengan PIECES and Ishikawa Diagram for Problem Discovery Analysis

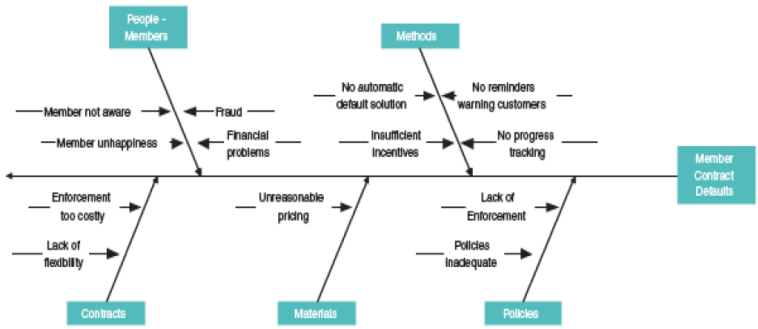

FIGURE 6-1 Sample Fishbone Diagram

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Teknik-Teknik Pengumpulan Data

1. Document Analysis → Sampling of Existing Documentation, Forms and Files
2. Research and Site Visits → research journals or benchmarking to companies with similar problems
3. Observation of the work Environment
4. Questionnaires
5. Interview

How to Conduct the Interview?

1. Select Interviewees
2. Prepare for the interview
3. Conduct the Interview
4. Follow Up the Interview
5. Listening
6. Non Verbal Communication (Body Language)

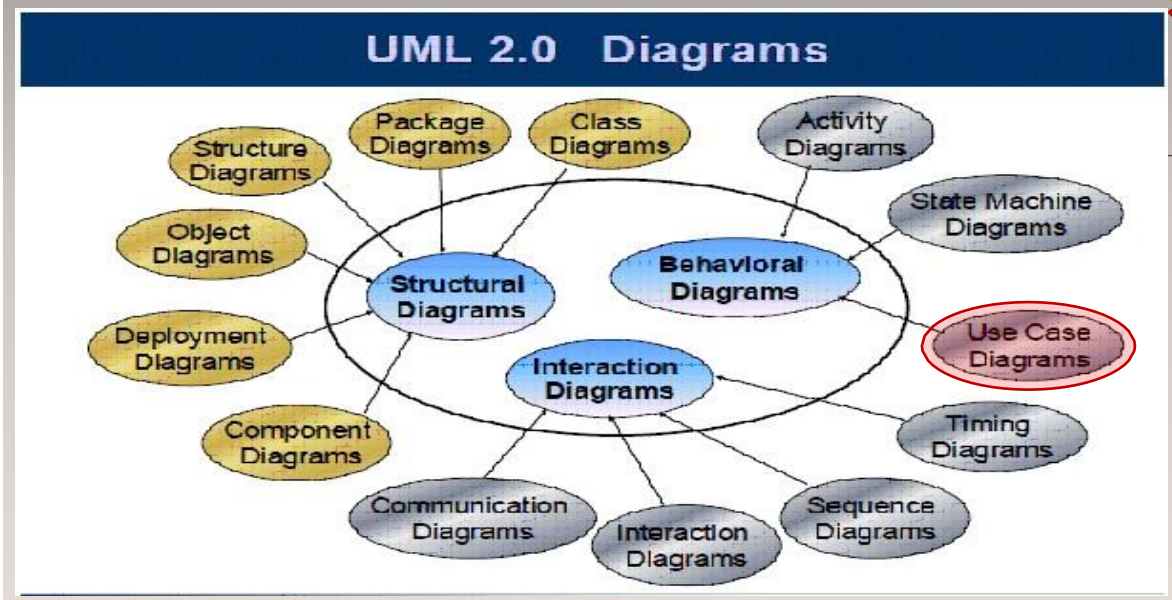
Do

- Dress appropriately.
- Be courteous.
- Listen carefully.
- Maintain control of the interview.
- Probe.
- Observe mannerisms and nonverbal communication.
- Be patient.
- Keep the interviewee at ease.
- Maintain self-control.
- Finish on time.

Interviewee: Jeff Bentley, Accounts Receivable Manager
Date: January 19, 2003
Time: 1:30 P.M.
Place: Room 223, Admin. Bldg.
Subject: Current Credit-Checking Policy

Time Allocated	Interviewer Question or Objective	Interviewee Response
1 to 2 min.	**Objective** Open the interview. • Introduce ourselves. • Thank Mr. Bentley for his valuable time. • State the purpose of the interview — to obtain an understanding of the existing credit-checking policies.	
5 min.	**Question 1** What conditions determine whether a customer's order is approved for credit? **Follow-up**	
5 min.	**Question 2** What are the possible decisions or actions that might be taken once these conditions have been evaluated? **Follow-up**	
3 min.	**Question 3** How are customers notified when credit is not approved for their order? **Follow-up**	
1 min.	**Question 4** After a new order is approved for credit and placed in the file containing orders that can be filled, a customer might request that a modification be made to the order. Would the order have to go through credit approval again if the new total order cost exceeds the original cost? **Follow-up**	
1 min.	**Question 5** Who are the individuals who perform the credit checks? **Follow-up**	
1 to 3 min.	**Question 6** May I have permission to talk to those individuals to learn specifically how they carry out the credit-checking process? **Follow-up** If so: When would be an appropriate time to meet with each of them?	
1 min.	**Objective** Conclude the interview. • Thank Mr. Bentley for his cooperation and assure him that he will be receiving a copy of what transpired during the interview.	
21 minutes	Time allotted for questions and objectives	
9 minutes	Time allotted for follow-up questions and redirection	
30 minutes	Time allotted for interview (1:30 p.m. - 2:00 p.m.)	
General Comments and Notes:		

FIGURE 6-3 Sample Interview Guide



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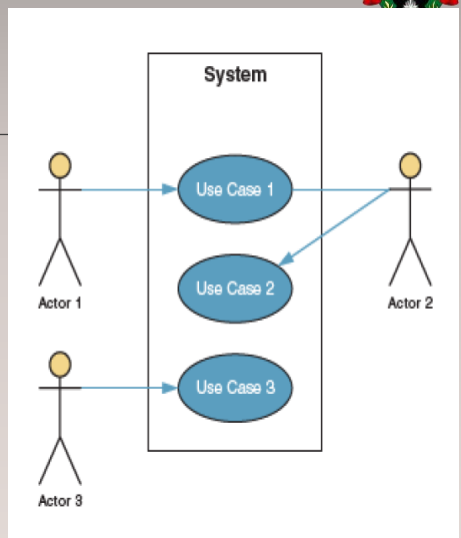
Use Case Concept

Use case adalah gambaran interaksi antara pengguna (aktor) dengan sistem. Sederhananya, use case menjelaskan apa yang dilakukan pengguna dengan sistem dan apa yang diharapkan pengguna dari sistem tersebut.

Use case diagram menggambarkan fungsionalitas yang diharapkan dari sebuah sistem, ditekankan adalah "apa" yang diperbuat sistem, dan bukan "bagaimana".

Komponen Utama:

1. **Aktor:** Entiti yang berinteraksi dengan sistem, bisa berupa manusia, perangkat keras, atau sistem lain.
2. **Use Case:** Fungsi atau layanan yang disediakan oleh sistem sebagai respons terhadap permintaan aktor.
3. **Hubungan:** Hubungan antara aktor dan use case (misalnya, aktor menggunakan use case).



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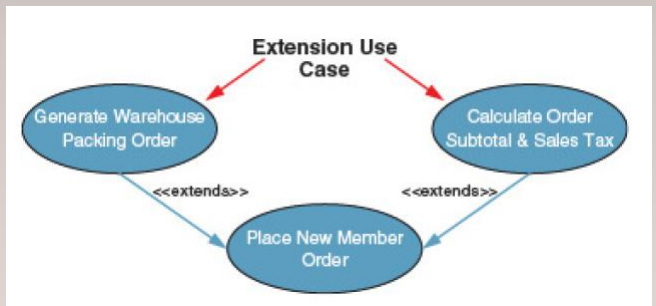
Hubungan Asosiasi

- **Definisi:** Menunjukkan hubungan antara aktor dan use case. Ini berarti aktor memiliki interaksi langsung dengan use case tersebut.
- **Contoh:** Pada sistem perbankan online, terdapat hubungan *association* antara aktor "Nasabah" dengan use case "Menarik Uang". Ini berarti nasabah dapat langsung melakukan aksi menarik uang.
- **Visualisasi:** Digambarkan dengan garis solid antara aktor dan use case.

(1) indicates the use case was imitated by the actor on the other end of the line. Associations without arrowheads (2) indicate an interaction between the use case and an external server or receiver actor. When any actor is associated with a use case, we say the actor *communicates* with the use case

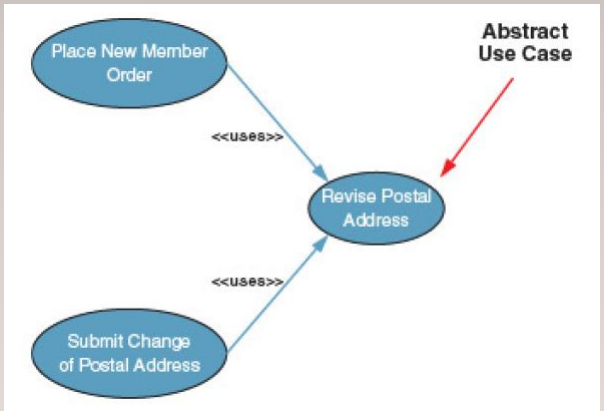
Hubungan Extend

- **Definisi:** Menunjukkan bahwa sebuah use case merupakan spesialisasi dari use case lainnya. Use case yang diperluas (anak) menambahkan perilaku tambahan pada use case induk.
- **Contoh:** Use case "Menarik Uang Tunai" merupakan *extend* dari use case "Transaksi". Ini berarti menarik uang tunai adalah salah satu jenis transaksi.
- **Visualisasi:** Digambarkan dengan garis putus-putus (atau solid) berpanah dari use case anak ke use case induk, dengan kata kunci <<extend>> di atas panah.



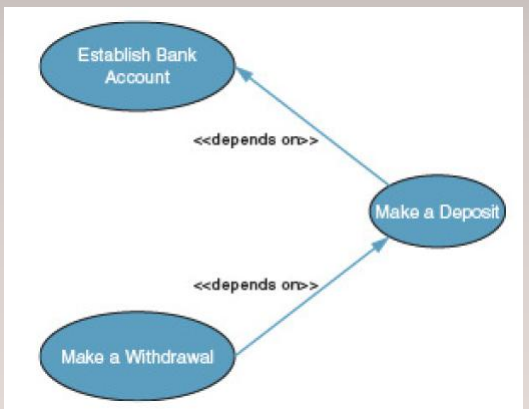
Hubungan Include

- **Definisi:** Menunjukkan bahwa sebuah use case menggunakan fungsionalitas dari use case lainnya. Use case yang disertakan (anak) merupakan bagian yang selalu ada pada use case induk.
- **Contoh:** Use case "Membeli Produk" *include* use case "Verifikasi Pembayaran". Setiap proses pembelian pasti melibatkan verifikasi pembayaran.
- **Visualisasi:** Digambarkan dengan garis putus-putus (atau solid) berpanah dari use case induk ke use case anak, dengan kata kunci <<include>> di atas panah.

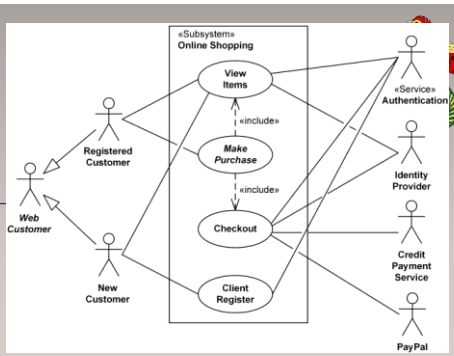


Hubungan Dependency

- **Definisi:** Menunjukkan bahwa perubahan pada satu elemen (misalnya, use case) akan berdampak pada elemen lainnya. Ini sering digunakan untuk menggambarkan hubungan antara use case dan sistem eksternal atau konfigurasi tertentu.
- **Contoh:** Use case "Mencetak Struk" *depend on* pada konfigurasi printer. Jika konfigurasi printer berubah, maka use case mencetak struk juga akan terpengaruh.
- **Visualisasi:** Digambarkan dengan garis putus-putus berpanah dari elemen yang bergantung ke elemen yang memengaruhi, dengan kata kunci <<depend on>> di atas panah.



Cara Membuat Use Case



1. Identifikasi Aktor:
•Tentukan siapa saja yang akan berinteraksi dengan sistem.
•Bisa berupa manusia, perangkat keras, atau sistem lain.
2. Identifikasi Use Case:
•Tentukan tindakan-tindakan apa yang dapat dilakukan oleh aktor pada sistem.
•Setiap use case mewakili satu fungsi atau layanan yang disediakan oleh sistem.
3. Tentukan Hubungan:
•Hubungkan aktor dengan use case yang dapat mereka gunakan.
•Gunakan panah untuk menunjukkan hubungan ini.

4. Tambahkan Deskripsi:
•Untuk setiap use case, tuliskan deskripsi singkat tentang apa yang dilakukan use case tersebut.
5. Pertimbangkan Relasi:
•Jika ada hubungan antara use case (misalnya, satu use case termasuk dalam use case lain), gunakan notasi yang sesuai.

Kesimpulan

1. Tahap Analisis Sistem terdiri dari: Scope Definition → Project Charter, Problem Analysis → System Improvement Objectives, Requirement Analysis → Bussiness Requirement Statement, Logical Design → System Models or (and) Prototypes, Decision Analysis→ System Proposal
2. Teknik Pengumpulan Data terdiri dari: Document Analysis, Research and Benchmark, Observation, Questionnaires, Interview
3. Komponen Utama Use Case terdiri dari : Aktor, Use Case, Hubungan

Terima Kasih