ANALISA dan RANCANGAN
SISTEM INFORMASI

disusun
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JAKARTA
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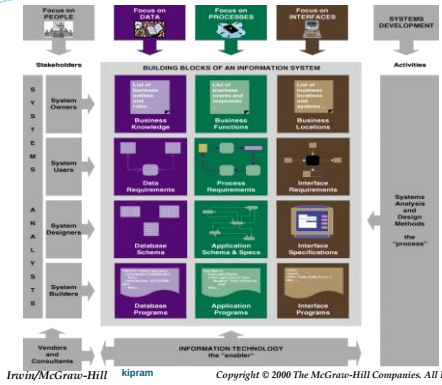
BAB I
PENDAHULUAN

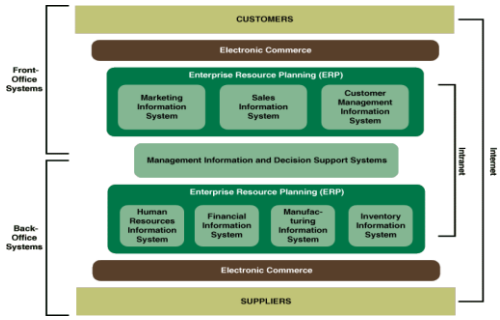
A. Information System Building Blocks



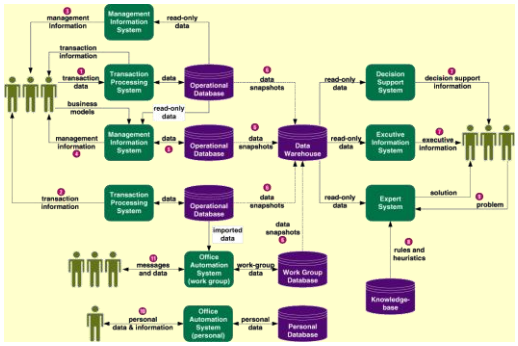
Front- and Back-Office Information Systems

- **Front-office information systems** support business functions that reach out to customers (or constituents).
  - Marketing
  - Sales
  - Customer management
- **Back-office information systems** support internal business operations and interact with suppliers (of materials, equipment, supplies, and services).
  - Human resources
  - Financial management
  - Manufacturing
  - Inventory control

A Federation of Information Systems



Information Systems Applications



Types of Information Systems and Systems Development

- **Transaction Processing Systems (TPS)**
  - Automate handling of data about business activities (transactions)
- **Management Information Systems (MIS)**
  - Converts raw data from transaction processing system into meaningful form
- **Decision Support Systems (DSS)**
  - Composed of database designed to help decision makers
  - Provides interactive environment for decision makers to manipulate data and models
- **Expert Systems (ES)**
  - Codifies and manipulate knowledge instead of information
  - Users communicate with an ES through interactive dialogue

B. Pengembangan dalam analysis dan design :

Software Engineering Process

A process used to create an information system

Consists of:

- ***Methodologies***
  - **A sequence of step-by-step approaches that help develop the information system**
- ***Techniques***
  - **Processes that the analyst follows to ensure thorough, complete and comprehensive analysis and design**
- ***Tools***
  - **Computer programs that aid in applying techniques**

Data and Processes

- **Three key components of an information system**
  - **Data**
  - **Data Flows**
  - **Processing Logic**
- **Data** vs. **Information**
  - **Data**
    - Raw facts about people, objects, and events in an organization such as customer's account number
  - **Information**
    - Data that have been processed and presented in a form that humans can understand

Data and Processes

- **Data**
  - Understanding the source and kind of data a system uses is key to good system design
  - Various techniques are used to describe data and the relationship among data
- **Data Flow**
  - Groups of data that move and flow through the system from one place to another
  - Include description of *sources* and *destination* for each data flow
- **Processing Logic**
  - Describe steps in the transformation of data and events that trigger these steps

Approaches to Systems Development

- **Process-Oriented Approach**
  - Focus is on **how** and **when** data are moved and **transformation** of data in an information system
  - Involves creating graphical representations such as **data flow diagrams** and **charts**
  - Data are tracked from sources, through intermediate steps and to final destinations
  - Natural structure of data is not specified
  - Disadvantage: existence of several data files each locked within different applications.
  - To change a single data element all files has to be updated

Approaches to Systems Development

- **Data-Oriented Approach**
  - Depicts **ideal organization** of data, independent of where and how data are used
  - Data model describes kinds of data and business relationships among the data
  - Business rules depict how organization captures and processes the data

Databases and Application Independence

- **Database**
  - **Shared collection of logically related data**
  - **Organized to facilitate capture, storage and retrieval by multiple users in an organization**
  - **Centrally managed**
  - **Designed around subjects**
    - **Customers**
    - **Suppliers**
- **Application Independence**
  - **Separation of data and definition of data from applications that use these data**

C. Organizational Responsibilities in Systems Development

- Systems Analysts work in teams
  - Project Based
  - Includes
    - IS Manager
    - Programmers
    - Users
    - Other specialists
  - Characteristics of Successful Teams
    - Diversity of backgrounds
    - Tolerance of diversity
    - Clear and complete communication
    - Trust
    - Mutual Respect
    - Reward structure that promotes shared responsibility

- IS Manager
  - May have a direct role in systems development if the project is small
  - Typically involved in allocating resources to and overseeing system development projects.
- Systems Analyst
  - Key individuals in the systems development process

D. Skills of a Successful Systems Analyst

- Analytical
  - Understanding of organizations
  - Problem solving skills
  - System thinking
    - Ability to see organizations and information systems as systems
- Technical
  - Understanding of potential and limitations of technology
- Management
  - Ability to manage projects, resources, risk and change
- Interpersonal
  - Effective written and oral communication skills

- Programmers
  - Convert specifications into instructions that the computer understands
  - Write documentation and testing programs
- Business Managers
  - Have power to fund projects and allocate resources
  - Set general requirements and constraints for projects

- Other IS Managers/Technicians
  - Database Administrator
    - Involved in design, development and maintenance of databases
  - Network and telecommunications experts
    - Develop systems involving data and/or voice communications
  - Human Factors Specialists
    - Involved in training users and writing documentation
  - Internal Auditors
    - Ensure that required controls are built into the system

E. Principles of System Development

- Get the system users involved.
- Use a problem-solving approach.
- Establish phases and activities.
- Document through development.
- Establish standards.
- Manage the process and projects
- Justify systems as capital investments.
- Don't be afraid to cancel or revise scope.
- Divide and conquer.
- Design systems for growth and change.

F. Representative System Development Methodologies

- Architected Rapid Application Development (Architected RAD)
- Dynamic Systems Development Methodology (DSDM)
- *Joint Application Development (JAD)*
- Information Engineering (IE)
- *Rapid Application Development (RAD)*
- *Rational Unified Process (RUP)*
- *Structured Analysis and Design*
- eXtreme Programming (XP)

The PIECES Problem-Solving Framework

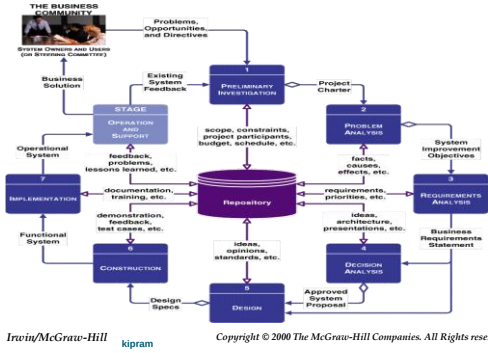
P	the need to improve performance
I	the need to improve information (and data)
E	the need to improve economics, control costs, or increase profits
C	the need to improve control or security
E	the need to improve efficiency of people and processes
S	the need to improve service to customers, suppliers, partners, employees, etc.

Cross Life Cycle Activities

Cross life cycle activities are activities that overlap many or all phases of the methodology.

- Fact-finding
- Documentation and presentation
- Feasibility analysis
- Process and project management

Sharing Knowledge via a Repository



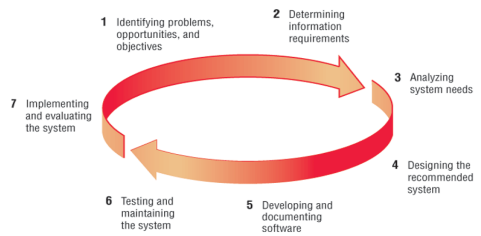
Approaches to Development

- Prototyping
  - Building a scaled-down working version of the system
  - Advantages:
    - Users are involved in design
    - Captures requirements in concrete form
- Rapid Application Development (RAD)
  - Utilizes prototyping to delay producing system design until after user requirements are clear

- Joint Application Design (JAD)
  - Users, Managers and Analysts work together for several days
  - System requirements are reviewed
  - Structured meetings
- Computer-aided software engineering (CASE) tools
  - Facilitate creation of a central repository for system descriptions and specifications

G. SIKLUS PENGEMBANGAN SYSTEM INFORMASI (SDLC)

Figure 1.3 The seven phases of the systems development life cycle.



Irwin/McGraw-Hill

H. Systems Analysis

4 Yang harus dimilikinya :

- Systems Thinking
- Organizational Knowledge
- Problem Identification
- Problem Analyzing and Solving

1.Systems Thinking

- System
  - Bagaimana prosedure hubungan business nya yg digunakan dalam bekerja setiap unit atau keseluruhannya
  - Mempunyai 9 characteristics
  - system yang berjalan termasuk environment
  - A boundary separates a system from its environment

- Characteristics of a System
  - Components
  - Interrelated Components
  - Boundary
  - Purpose
  - Environment
  - Interfaces
  - Input
  - Output
  - Constraints

- Important System Concepts
  - Decomposition
    - The process of breaking down a system into smaller components
    - Allows the systems analyst to:
      - Break a system into small, manageable subsystems
      - Focus on one area at a time
      - Concentrate on component pertinent to one group of users
      - Build different components at independent times

- Important System Concepts (Continued)
  - Modularity
    - Process of dividing a system into modules of a relatively uniform size
    - Modules simplify system design
  - Coupling
    - Subsystems that are dependent upon each other are coupled
  - Cohesion
    - Extent to which a subsystem performs a single function

- Important System Concepts (Continued)
  - Logical System Description
    - Portrays the purpose and function of the system
    - Does not tie the description to a specific physical implementation
  - Physical System Description
    - Focuses on how the system will be materially constructed

- Benefits
  - Identification of a system leads to abstraction
  - From abstraction you can think about essential characteristics of specific system
  - Abstraction allows analyst to gain insights into specific system, to question assumptions, provide documentation and manipulate the system without disrupting the real situation

- Applying Systems Thinking to Information Systems
  - Information systems are subsystems in larger organizational systems
  - Data flow diagrams represent information systems as systems
    - Inputs
    - Outputs
    - System boundaries
    - Environment
    - Subsystems
    - Interrelationships

2.Organizational Knowledge

- Understanding of how organizations work
- Knowledge of specific functions and procedures of organization and department
- How work officially gets done
- Internal policies
- Competitive and Regulatory Environment
- Organizational Strategies and Tactics

3. Problem Identification

- Problem: Difference between an existing situation and a desired situation
- Identification is process of defining differences
- Differences are defined by comparing the current situation to the output of a model that predicts what the output should be

4. Problem Analyzing and Solving

- Four Phases
  - Intelligence
    - All relevant information is collected
  - Design
    - Alternatives are formulated
  - Choice
    - Best alternative solution is chosen
  - Implementation
    - Solution is put into practice

Technical Skills for Systems Analysis

- Constant re-education is necessary as technology changes rapidly
- Activities to keep skills up-to-date
  - Trade publications
  - Professional societies
  - Attend classes or teach at a local college
  - Attend courses sponsored by organization
  - Conferences and trade shows
  - Browse Websites
  - Participate in new groups and conferences

Technical Skills for Systems Analysis

- Understanding of a wide variety of technologies is required
  - Microcomputers, workstations, minicomputers and mainframe computers
  - Programming languages
  - Operating systems
  - Database and file management systems
  - Data communication standards
  - Systems development tools and environments
  - Web development languages and tools
  - Decision support system generators

Management Skills for Systems Analysis

- Four categories
  - Resource Management
  - Project Management
  - Risk Management
  - Change Management

Resource Management

- Systems analyst needs to know how to get the most out of the resources of an organization, including team members
- Includes the following capabilities
  - Predicting resource usage
  - Tracking resource consumption
  - Effective use of resources
  - Evaluation of resource quality
  - Securing resources from abusive use
  - Relinquishing resources when no longer needed

Project Management

- Two Goals
  - Prevent projects from coming in late
  - Prevent projects from going over budget
- Assists management in keeping track of project's progress
- Consists of several steps
  - Decomposing project into independent tasks
  - Determining relationships between tasks
  - Assigning resources and personnel to tasks

Risk Management

- Ability to anticipate what might go wrong in a project
- Minimize risk and/or minimize damage that might result
- Placement of resources
- Prioritization of activities to achieve greatest gain

Change Management

- Ability to assist people in making transition to new system
- Ability to deal with technical issues related to change
  - Obsolescence
  - Reusability

Interpersonal Skills for Systems Analysis

- Mastery of interpersonal skills is paramount to success as a Systems Analyst
- Four types of skills:
  - Communication skills
  - Working alone and with a team
  - Facilitating groups
  - Managing expectations

Communication Skills

- Effective communication helps to establish and maintain good working relationships with clients and colleagues
- Skills improve with experience
- Three types used by Systems Analyst
  - Interviewing and Listening
  - Questionnaires
  - Written and Oral Presentations

Interviewing and Listening

- Means to gather information about a project
- Listening to answers is just as important as asking questions
- Effective listening leads to understanding of problem and generates additional questions

Questionnaires

- Advantages:
  - Less costly than interviews
  - Results are less biased due to standardization
- Disadvantages
  - Less effective than interviews due to lack of follow-up

Written and Oral Presentations

- Used to document progress of project and communicate this to others
- Communication takes several forms:
  - Meeting agenda
  - Meeting minutes
  - Interview summaries
  - Project schedules and descriptions
  - Memoranda requesting information
  - Requests for proposals from vendors and contractors
  - Oral presentations

Steps to Improving Communication Skills

- Practice
  - Conduct a training class
  - Volunteer to speak
- Videotape presentation and do a self-appraisal of your skills
- Make use of college writing centers
- Take classes on business and technical writing

Working Alone and with a Team

- Working alone on aspects of project involves managing:
  - Time
  - Commitments
  - Deadlines
- Team work involves establishing standards of cooperation and coordination
- characteristics of a high-performance team

Facilitating Groups

- Involves guiding a group without being a part of the group
- Useful skill for sessions such as Joint Application Development (JAD)
- lists guidelines for running a successful meeting

2.53

Managing Expectations

- Managing expectations is directly related to successful system implementation
- Skills for successful expectation management
  - Understanding of technology and workflows
  - Ability to communicate a realistic picture of new system to users
  - Effective education of management and users throughout systems development life cycle

Systems Analysis as a Profession

- Standards have been established for education, training, certification and practice
- Several aspects:
  - Standards of Practice
  - Ethics
  - Career Paths

Standards of Practice

- Endorsed Development Methodology
  - Specific procedures and techniques to be used during development process
  - Promote consistency and reliability across all of an organization's development projects
- Approved Development Platforms
  - Organizations standardize around a specific platform, sometimes tied to development methodology

Standards of Practice

- Standardization of Roles
  - Roles are becoming better defined across organizations
- Development of a Common Language
  - Common programming languages
  - Common modeling languages, such as Unified Modeling Language (UML)

Ethics

- Professional Ethics
  - ACM Code of Ethics
- Business Ethics
  - Stockholder approach
    - Any action taken by a business is acceptable as long as it is legal and maximizes stockholder profit
  - Stakeholder approach
    - Any action that violates rights of stakeholder must be rejected
  - Social Contract approach
    - Any action that is deceptive, can dehumanize employees or that could discriminate is rejected

Career Paths

- Consulting
- Information Systems within a large corporation
- Software vendors
- Other opportunities outside of systems analysis