Summary

- Basic type of computer-based information systems consist of **Transaction Processing System, Management Information System, and Strategic Information System**, which process data and information for different type of users.
- The development of information systems have to consider the **technological development**, such as cloud computing, big data, and also mobile technology.
- The primarily goal of information system is to **create value for the organization.**
- SDLC helps team member to understand **how an information system (IS) can support and enable business needs** by designing a system, building it, and delivering it to users.

Summary

- SDLC consists of **4-fundamental phases** (Planning, Analysis, Design and Implementation), which each phase refines and elaborates on the work done previously).
- The systems analyst is a key person analyzing the business, **identifying opportunities for improvement**, and designing information systems to implement these ideas.
- SDLC methodology that focuses on business process or data that support the business consists of **process-centered methodology, data methodology, and object-oriented methodology**
- SDLC methodology that focuses on the sequencing of SDLC phases and the amount of time and effort consists of **Structured Development, Rapid Application Development, and Agile Development**

Summary

- Criterias for selecting SDLC methodology: **clarity of user requirements, familiarity with technology, system complexity, system reliability, short time schedules, schedule visibility**

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TOPIC 2

PROJECT IDENTIFICATION AND SELECTION

ANALISIS DAN PERANCANGAN SISTEM INFORMASI

CSIM603183

Learning Objectives

1. Able to explain the importance of **business needs and business opportunities** as the underlying background of IS development
2. Able to explain how to **identify IS project** in an organization
3. Able to perform **feasibility analysis**
4. Able to explain how to **choose IS project** in an organization according to the result of feasibility analysis.

Session Outline

1. **Project Identification**

   To identify a project that will deliver **value to the business** and to **create a system request** that provides basic information about the proposed system

2. **Feasibility Analysis**

   To determine the **technical**, **economic**, and **organizational** feasibility of the system

3. **Project Selection**

   If appropriate, the system is selected and the development begins

Introduction

- The project sponsor is a key person proposing development or adoption of the new information technology .
  - Many organizations keep on eye on emerging technology
  - As a first mover
- The approval committee reviews proposals from various groups and units in the organization and decides which to commit towards the development.

1.1 PROJECT IDENTIFICATION

How do project begin?

- **Business needs** should drive projects.
  - A business unit or IT
  - A steering committee
  - A recommendation by external parties
- **Project sponsor** recognizes business need for new system and desires to see it implemented.
  - Usually from business function, e.g., Marketing, Accounting or Finance.
  - Member of IT can sponsor or co-sponsor a project
  - Size of project determine the kind of sponsor that is needed

How do project begin?

- **Business needs** determine the **business requirement** or **system's functionality** (what it will do).
- The project's **business value** should be clear
  - Tangible (e.g. 2% reduction in operational cost)
  - Intangible (e.g. improve customer service)

- **Formally** initiate the project → by creating a **system request**

System Request

- It is a document that describes the business reasons for building a system and the value that the system is expected to provide.
- Lists key elements of the project
  1. Project sponsor
  2. Business need
  3. Business requirement (functionality)
  4. Business value
  5. Special issues or constraints

Element of System Request

1. **Project sponsor**
   - The person who initiates the project
   - Serves as primary point of contact for the project on the business side
     - Members of the Finance Dept., IT Manager, CIO, Vice President of Marketing
2. **Business Need**
   - The business-related reason for initiating the system
     - Increase sales → opportunity
     - Improve market share → opportunity
     - Improve customer service → pain
     - Decrease product defects → pain

Element of System Request

3. **Functionality (Business Requirement)**
   - The business capabilities that the system will provide in very high level of detail → **solution**
     - Provide online access to information
     - Produce management report
     - Capture customer demographic information
     - Include product search capabilities

Element of System Request

4. **Business Value**
   - Tangible value can be quantified and measured easily (e.g., 2 percent reduction in operating costs).
   - An intangible value results from an intuitive belief that the system provides important, but hard-to-measure, benefits to the organization (e.g., improved customer service or a better competitive position).

Element of System Request

4. **Business Value**
   - The benefits that the system will create for the organization
     - 3 percent increase in sales
     - 1 percent increase in market share
     - 5 percent reduction in production cost
     - Improved customer service
     - A better competition position

Element of System Request

5. **Special Issues**
   - Issues that are relevant to the implementation of the system and committee make decisions about the project
     - System needed in time for the Lebaran holiday season
     - Government-mandated deadline for May 30.

System Request Examples for CD Selection Project

- **Project sponsor** – VP of Marketing
- **Business need** – Reach new customers and improve service to existing customers
- **Business requirements** – Provide web-based shopping capability
- **Business value** - $750,000 in new customer sales; $1.8M in existing customer sales, $50,000 yearly reduction in customer service calls
- **Special issues or constraints** – System must be operational by holiday shopping season

Preliminary Project Acceptance

- System request/Stakeholder request is reviewed by approval committee
- Based on information provided, project merits are assessed.
- Worthy projects are accepted and undergo additional investigation – the feasibility analysis.

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The PIECES Problem-Solving Framework *)

P the need to correct or improve performance

I the need to correct or improve information (and data)

E the need to correct or improve economics, control costs, or increase profits

C the need to correct or improve control or security

E the need to correct or improve efficiency of people and processes

S the need to correct or improve service to customers, suppliers, partners, employees, etc.

*) adopted from Whitten, et al, "Systems Analysis & Design 7ed", Mc-Graw Hill

The PIECES Problem –Solving Framework and Checklist

1. **PERFORMANCE**
   - Throughput - the amount of work performed over some period of time.
   - Response times - the average delay between a transaction or request, and a response to that transaction or request.

The PIECES Problem –Solving Framework and Checklist

2. INFORMATION (and Data)

- Outputs
  - Lack of any information
  - Lack of necessary information
  - Lack of relevant information
  - Too much information - "information overload"
  - Information that is not in a useful format
  - Information that is not accurate
  - Information that is difficult to produce
  - Information is not timely to its subsequent use

The PIECES Problem –Solving Framework and Checklist

2. INFORMATION (and Data)

- Data Inputs
  - Data is not captured
  - Data is not captured in time to be useful
  - Data is not accurately captured – contains errors
  - Data is difficult to capture
  - Data is captured redundantly -- same data captured more than once
  - Toc much data is captured
  - Illegal data is captured

The PIECES Problem –Solving Framework and Checklist

2. INFORMATION (and Data)

- Stored data
  - Data is stored redundantly in multiple files and/or databases
  - Same data items have different values in different files (poor data integration)
  - Stored data is not accurate
  - Data is not secure to accident or vandalism
  - Data is not well organized
  - Data is not flexible - not easy to meet new information needs from stored data
  - Data is hot accessible

The PIECES Problem –Solving Framework and Checklist

3. **ECONOMICS**
   - Costs
     - Costs are unknown
     - Costs are untraceable to source
     - Costs are too high
   - Profits
     - New markets can be explored
     - Current marketing can be improved
     - Orders can be increased

The PIECES Problem –Solving Framework and Checklist

4. CONTROL AND SECURITY

- Too little security or control
  - Input data is not adequately edited
  - Crimes (e.g., fraud, embezzlement) are (or can be) committed against data
  - Ethics are breached on data or information -- refers to data or information getting to unauthorized people
  - Redundantly stored data is inconsistent in different files or databases
  - Data privacy regulations or guidelines are being (or can be) violated
  - Processing errors are occurring (either by people, machines, or software)
  - Decision-making errors are occurring

The PIECES Problem –Solving Framework and Checklist

4. CONTROL AND SECURITY

- Too much security or control
  - Bureaucratic red tape slows the system
  - Controls inconvenience customers or employees
  - Excessive controls cause processing delays

The PIECES Problem –Solving Framework and Checklist

5. **EFFICIENCY**
   - People, machines, or computers waste lime
     - Data is redundantly input or copied
     - Data is redundantly processed
     - Information is redundantly generated
   - People, machines, or computers waste materials and supplies
   - Effort required for tasks is excessive
   - Material required for tasks is excessive

The PIECES Problem –Solving Framework and Checklist

5. **SERVICE**
   - The system produces inaccurate results
   - The system produces inconsistent results
   - The system produces unreliable results
   - The system is not easy to learn
   - The system is not easy to use
   - The system is awkward to use
   - The system is inflexible to new or exceptional situations
   - The system is inflexible to change
   - The system is incompatible with other systems

Case Example ☺

If you were building a web-based system for course registration,

1. Who is the project sponsor?
2. What is the business need?
3. What would be the business requirements?
4. What would be the business value (tangible and intangible)?
5. What special issues or constraints would you foresee?

Case Example ☺

Car dealers have realized how profitable it can be to sell automobiles using the Web. Pretend that you work for a local car dealership that is part of a large chain such as CarMax. **Create a system request you might use to develop a Web-based sales system.**


HOW'S YOUR PROJECT GOING?
DO YOU MEAN THE ONE THAT HAS. . .
Dilbert.com DilbertCartoonist@gmail.com
. . . NO MANAGEMENT SUPPORT, AMBIGUOUS GOALS, NO BUDGET, AND AN ANGRY TEAM OF OVERWORKED PEOPLE WHO WANT IT TO DIE?
11-24 © 2012 Scott Adams, Inc. /Dist. by Universal Uclick
NO, THE OTHER ONE.
SOMETIMES THERE ISN'T AN "OTHER ONE."

1.2 FEASIBILITY ANALYSIS

Feasibility Analysis

- Once the need for the system and its business requirements have been defined → **feasibility analysis**
- **Feasibility analysis:**
  - Guide the organization in determining whether to proceed with the project
  - Identify the important risks
- **Detailing Expected Costs and Benefits**
  1. Technical feasibility
  2. Economic feasibility
  3. Organizational feasibility

#1 Technical Feasibility: Can we build it?

- Familiarity with application/functional areas
  - Knowledge of business domain
    - If analysts are unfamiliar with the business application area, they have a greater chance of misunderstanding the users or missing opportunities for improvement.
    - Development of new system is riskier than extensions to an existing system, because existing system tend to be better understood
- Familiarity with technology
  - Risk increase dramatically when the technology is new

#1 Technical Feasibility: Can we build it?

- Project size
  - Number of people, time, and features
- Compatibility with the existing technology
  - System rarely built in vacuum
  - Should rely on existing data, infrastructure

#2 Economic Feasibility: Should we build it?

- ❑ Identify costs and benefits
- ❑ Assign values to costs and benefits
- ❑ Determine cash flow
- ❑ Assess financial viability
  - Net present value (NPV)
  - Return on investment (ROI)
  - Break even point (BEP)

#2 Economic Feasibility: Should we build it?

1. Identify Costs and Benefits
2. Assign Values to Costs and Benefits
3. Determine Cash Flow
4. Determine Net Present Value
5. Determine Return on Investment
6. Calculate Break-Even Point
7. Graph Break-Even Point

#2 Economic Feasibility: Tangible vs. Intangible Costs

- *Tangible Costs* – Includes revenue that the system enables the organization to collect, such as increased sales.
- *Intangible Costs* – Are base on intuition and belief rather than "hard numbers."

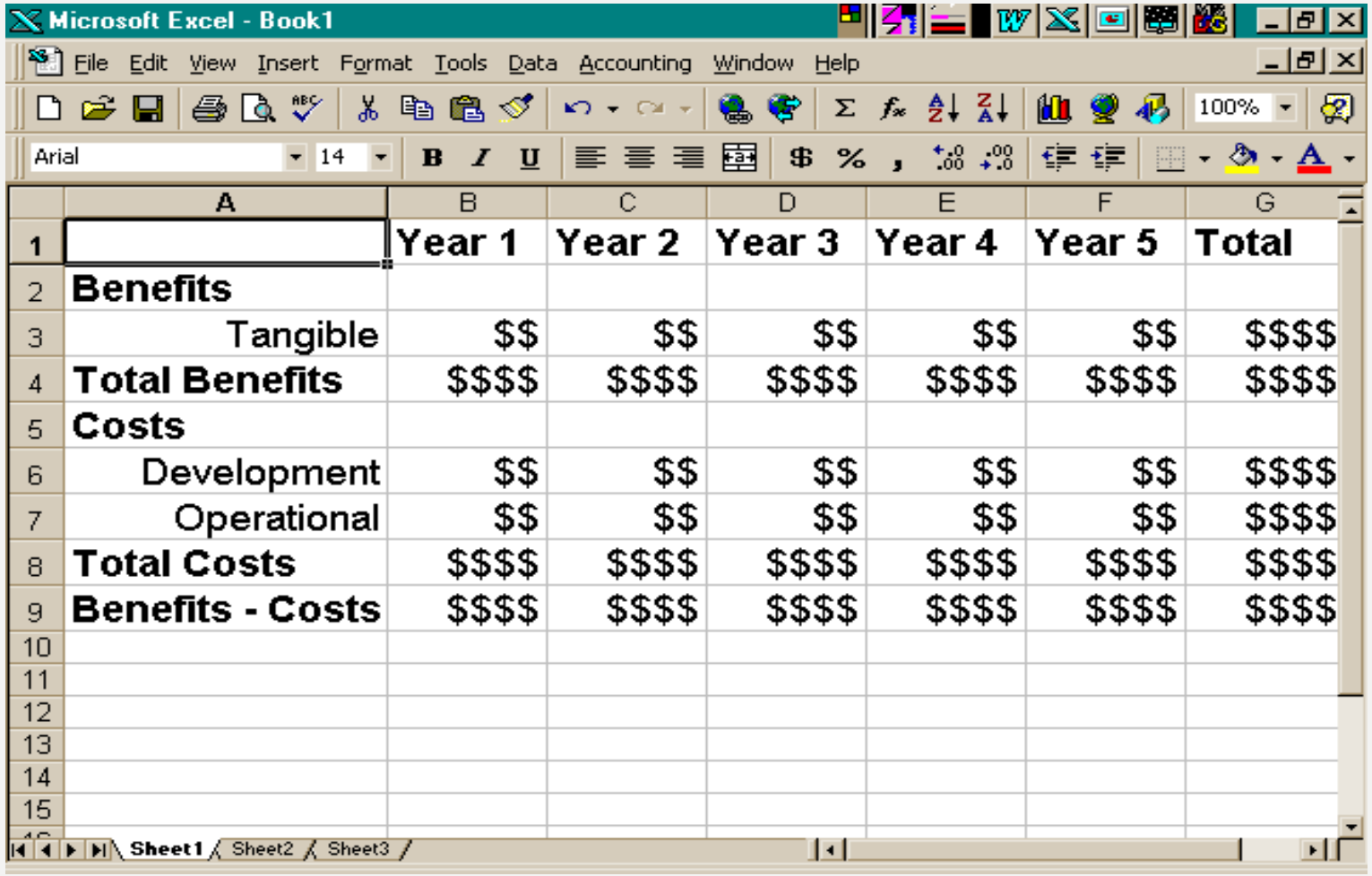
Example Costs and Benefits for Economic Feasibility

Development Costs		Operational Costs
Development Team Salaries		Software Upgrade
Consultant Fees		Software Licensing Fees
Development Training		Hardware Repair
Hardware and Software		Hardware Upgrade
Vendor Installation		Operational Team Salaries
Office Space and Equipment		Communications Charges
Data Conversion Costs		User Training
Tangible Benefits		**Intangible Benefits**
Increased Sales		Increased Market Share
Reduction in Staff		Increased Brand Recognition
Reduction in Inventory		Higher Quality Products
Reductions in IT Costs		Improved Customer Service
Better Supplier Prices		Better Supplier Relation

Assign Cost and Benefit Values

- Difficult, but essential to estimate
  - Work with people who are most familiar with the area to develop estimates → Consultants, sales projection, order level, etc.
  - Past project, industry report, etc.
- Intangibles should also be quantified
- If intangibles cannot be quantified, list and include as part of supporting material.

Cash Flow Method for Cost Benefit Analysis



	A	B	C	D	E	F	G
1		Year 1	Year 2	Year 3	Year 4	Year 5	Total
2	**Benefits**						
3	Tangible	$$	$$	$$	$$	$$	$$$$
4	**Total Benefits**	$$$$	$$$$	$$$$	$$$$	$$$$	$$$$
5	**Costs**						
6	Development	$$	$$	$$	$$	$$	$$$$
7	Operational	$$	$$	$$	$$	$$	$$$$
8	**Total Costs**	$$$$	$$$$	$$$$	$$$$	$$$$	$$$$
9	**Benefits - Costs**	$$$$	$$$$	$$$$	$$$$	$$$$	$$$$
10							
11							
12							
13							
14							
15							

Formulas for Determining Value

Calculation	Definition	Formula
Present Value (PV)	The amount of an investment today compared to that same amount in the future, taking into account inflation and time.	$\frac{\text{Amount}}{(1 + \text{interest rate})^n}$ n = number of years in future
Net Present Value (NPV)	The present value of benefit less the present value of costs.	PV Benefits − PV Costs
Return on Investment (ROI)	The amount of revenues or cost savings results from a given investment.	$\frac{\text{Total benefits} - \text{Total costs}}{\text{Total costs}}$
Break-Even Point	The point in time at which the costs of the project equal the value it has delivered.	$\frac{\text{Yearly NPV*} - \text{Cumulative NPV}}{\text{Yearly NPV*}}$ *Use the Yearly NPV amount from the first year in which the project has a positive cash flow. Add the above amount to the year in which the project has a positive cash flow.

Example of NPV Calculation

Benefits						
Increased Sales		500,000	530,000	561,800	595,508	
Reduction in Customer Complaint Calls[a]		70,000	70,000	70,000	70,000	
Reduced Inventory Costs		68,000	68,000	68,000	68,000	
Total Benefits[b]		638,000	668,000	699,800	733,508	
Present Value Total Benefits		**601,887**	**594,518**	**587,566**	**581,007**	**2,364,978**
Development Costs						
2 Servers @ $125,000	250,000	0	0	0	0	
Printer	100,000	0	0	0	0	
Software Licenses	34,825	0	0	0	0	
Server Software	10,945	0	0	0	0	
Development Labor	1,236,525	0	0	0	0	
Total Development Costs	**1,632,295**	**0**	**0**	**0**	**0**	
Operational Costs						
Hardware		50,000	50,000	50,000	50,000	
Software		20,000	20,000	20,000	20,000	
Operational Labor		115,000	119,600	124,384	129,359	
Total Operational Costs		**185,000**	**189,600**	**194,384**	**199,359**	
Total Costs	**1,632,295**	**185,000**	**189,600**	**194,384**	**199,359**	
Present Value Total Costs	**1,632,295**	**174,528**	**168,743**	**163,209**	**157,911**	**2,296,686**
NPV (PV Total Benefits – PV Total Costs)						**68,292**

[a] Customer service values are based on reduced costs of handling customer complaint phone calls.

[b] An important yet intangible benefit will be the ability to offer services that our competitors currently offer.

If NPV >= 0,

Project is OK

If NPV < 0,

Project is unacceptable

Assess Financial Viability – Return on Investment

Benefits						
Increased Sales		500,000	530,000	561,800	595,508	
Reduction in Customer Complaint Calls[a]		70,000	70,000	70,000	70,000	
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[a] Customer service values are based on reduced costs of handling customer complaint phone calls.

[b] An important yet intangible benefit will be the ability to offer services that our competitors currently offer.

$$ROI = \frac{NPV}{PV\ Total\ Cost}$$

Assess Financial Viability – Break Even Point

- How long before the project's returns match the amount invested (make a graphic of ROI).
- The longer it takes to break even, the higher the project's risk.

#3 Organizational Feasibility: If we build it, will they come?

- There are two ways to assess:

  (1) How well the goal of the project **align with business objectives**

  Strategic alignment → the fit between the goals of the project and business strategy

  (2) **Stakeholder analysis**

  - Project champion(s)
    - ❑ A high-level non-IS executive who is usually but not always the person who created the system request.
  - Organizational management
    - ❑ Does management support the project ?
  - System users

#3 Organizational Feasibility: Stakeholder Analysis

- **Champion**
  - Initiate, promote, allocate his/her time and provide resources to the project
- **Organizational Management**
  - Know about the project
  - Budget enough money for the project
  - Encourage users to accept and use the system
- **System Users**
  - Make decisions that influence the project
  - Perform hands-on activities for the project
  - Ultimately determine whether the project is successful by using or not using the system

Decision on the Result of Feasibility Analysis

- It is suggested to make several feasibility analysis scenarios.
- Exercise yourself to put weight on components of feasibility analysis (technical, economical, organizational, etc) → some techniques could be used, e.g., MCDM (Multi Criteria Decision Making)
- Make your best intellectual judgment which scenario you would strongly recommend to your client.
- Elaborate the advantages and the disadvantages of the scenarios.

1.3 PROJECT SELECTION

Project Selection

- Approval committee works from the system request and the feasibility study
  - Project portfolio – how does the project fit within the entire portfolio of projects?
  - Trade-offs must be made to select projects that will form a balanced project portfolio
  - Even though offer considerable ROI, viable projects may be rejected or deferred because of project portfolio issues or other possible reasons such as limited budget, the organization is about to go through some kind of change (e.g., a merger), or projects that meet the same business requirements already are under way.

Project Selection Issue

Size	What is the size? How many people are needed to work on the project?
Cost	How much will the project cost the organization?
Purpose	What is the purpose of the project? Is it meant to improve the technical infrastructure? Support a current business strategy? Improve operations? Demonstrate a new innovation?
Length	How long will the project take before completion? How much time will go by before value is delivered to the business?
Risk	How likely is it that the project will succeed or fail?
Scope	How much of the organization is affected by the system? A department? A division? The entire corporation?
Return on investment	How much money does the organization expect to receive in return for the amount the project costs?

SUMMARY

Summary

- **Project initiation** involves creating and assessing goals and expectations for a new system
- Identifying the **business value** of the new project is a key to success
- **Feasibility study** is concerned with insuring that technical, economic, and organizational benefits outweigh costs and risks
- **Project selection** involves viewing the project within the context of the entire **project portfolio**, and selecting those projects that contribute to **balance** in the portfolio

In Class Exercise

Refer to Document **[Week 2] In Class Exercise**

Example In Class Exercise: Calculating Cost-Benefit Analysis

- Suppose that you are interested in buying a new computer. Create a cost–benefit analysis that illustrates the return on investment (ROI) that you would receive from making this purchase. Computer-related websites (e.g., Apple, Dell, HP) should have real tangible costs that you can include in your analysis. Project your numbers out to include a three-year period and provide the net present value (NPV) of the final total.

Case Example: Project Selection

In April 1999, one of Capital Blue Cross's health-care insurance plans had been in the field for three years but hadn't performed well as expected. The ratio of premiums to claims payments wasn't meeting historic norms. To revamp the product features or pricing to boost performance, the company needed to understand why it was underperforming. The stakeholders came to the discussion already knowing they needed better extraction and analysis of usage data to understand product shortcomings and recommend improvements.

Case Example: Project Selection (cont')

After listening to input from the user teams, the stakeholders proposed three options. One was to persevere with the current manual method of pulling data from flat files via ad hoc reports and retyping it into spreadsheets.

The second option was to write a program to dynamically mine the needed data from Capital's customer information control system (CICS). While the system was processing claims, for instance, the program would pull out up-to-the-minute data at a given point in time for users to analyze.

Case Example: Project Selection (cont')

The third alternative was to develop a decision support system to allow users to make relational queries from a data mart containing a replication of the relevant claims and customer data. Each of these alternatives was evaluated on cost, benefits, risks, and intangibles.

Questions

1. What are three costs, benefits, risks, and intangibles associated with each project?
2. Based on your answer to question 1, which project would you choose?

Source: Richard Pastore, "Capital Blue Cross," *CIO Magazine* (February 15, 2000).

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