HUST

TRƯỜNG ĐẠI HỌC BÁCH KHOA HÀ NỘI
HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY

System Analysis and Design

IT3120E

ONE LOVE. ONE FUTURE.

Chapter 3: *Project Management*

- 3.1 Project Initialization
  - System request
  - Feasibility analysis
  - Project selection
- 3.2. Project management process
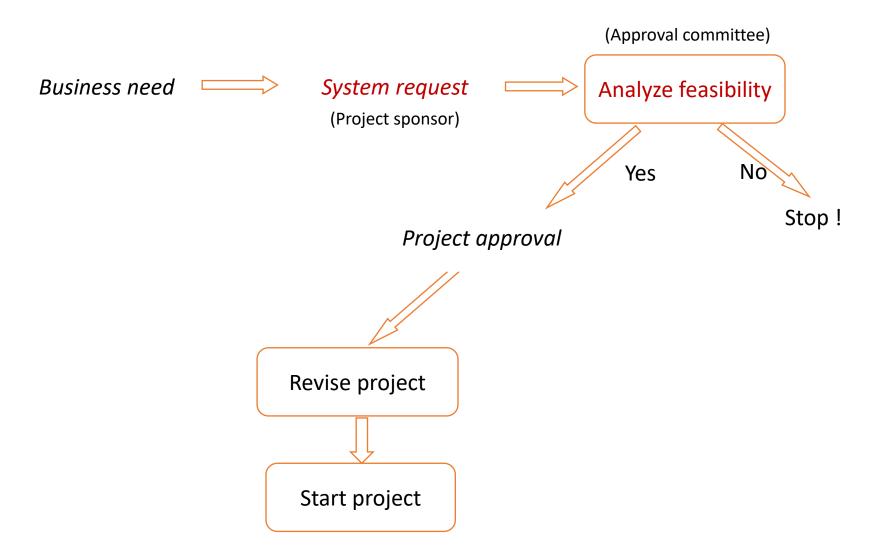 - Traditional project management tools

- Successful Projects = Cost + Schedule + Performance
- Stakeholders:
  - *Project sponsor (*business person*):* someone who recognizes the strong business need for the system and has an interest in seeing the system succeed.
    - will work throughout the development process to make sure that the project is moving in the right direction from the perspective of the business.
  - IT professionals
  - *Approval committee (*joint by business person and IT professionals*)*

Business need → *System request* → Analyze feasibility

(Project sponsor)

(Approval committee)

Yes   No

Project approval

Stop !

Revise project

Start project

- Project identification
  - System request: kicks off the inception phase for the new system development project.

  - Feasibility analysis: examines the pros and cons of developing the system → detailed picture of the advantages of investing in the system as well as any obstacles that could arise.

- A *system request :* a document that describes the business reasons for building a system and the value that the system is expected to provide.
  - include five elements:

System Request—Name of Project	
Project Sponsor:	Name of project sponsor
Business Need:	Short description of business need
Business Requirements:	Description of business requirements
Business Value:	Expected value that the system will provide
Special Issues or Constraints:	Any additional information that may be relevant to the stakeholders

Case study: CD selections

- About CD selections company:
  - 50 music stores in California
  - Sales: 50 million USD
  - Growth 3-5 % / year
  - A simple website that provides basic information about the company such as directions, opening hours, contact address

- Margaret Mooney, vice president of marketing, had the idea to sell CDs on the Internet

Dennis, Alan, Barbara Haley Wixom, and David Tegarden. **Systems analysis and design: An object-oriented approach with UML.** John Wiley & Sons. 4th edition 2012.

System Request—Internet order project

Project sponsor: Margaret Mooney, Vice President of Marketing

Business Need: This project has been initiated to reach new Internet customers and to better serve existing customers using Internet sales support.

Business Requirements:

Using the Web, customers should be able to search for products and identify the brick-and-mortar stores that have them in stock. They should be able to put items on hold at a store location or place an order for items that are not carried or not in stock. The functionality that the system should have is listed below:

- Search through the CD Selections' inventory of products
- Identify the retail stores that have the product in stock
- Put a product on hold at a retail store and schedule a time to pick up the product
- Place an order for products not currently in stock or not carried by CD Selections
- Receive confirmation that an order can be placed and when it will be in stock

Business Value:

We expect that CD Selections will increase sales by reducing lost sales due to out-of-stock or nonstocked items and by reaching out to new customers through its Internet presence. We expect the improved services will reduce customer complaints, primarily because 50 percent of all customer complaints stem from out of stocks or nonstocked items. Also, CD Selections should benefit from improved customer satisfaction and increased brand recognition due to its Internet presence.

Intangible value

Conservative estimates of tangible value to the company includes:

- $750,000 in sales from new customers
- $1,875,000 in sales from existing customers
- $50,000 yearly reduction in customer service calls

Tangible value

Special Issues or Constraints:

- The Marketing Department views this as a strategic system. This Internet system will add value to our current business model, and it also will serve as a proof of concept for future Internet endeavors. For example, in the future, CD Selections may want to sell products directly over the Internet.
- The system should be in place for the holiday shopping season next year.

- The approval committee review the system request to decides:
  - Approve the project
  - Decline the project → *Feasibility analysis*
  - Table it until additional information is available
- Purpose: to determine whether or not to start the project
- <u>How</u>:
  - Analyze the *opportunities* and *limitations* associated with the proposed project.
  - Identify the *important risks* associated if the project is approved
  - If at any point the project's risks and limitations outweigh its benefits, may decide to cancel the project or make necessary improvements
- Output: *Feasibility study* on
  - Technical feasibility
  - Economic feasibility
  - Organizational feasibility

Feasibility study

- Assessment factors

Technical Feasibility: Can We Build It?

- Familiarity with Functional area: Less familiarity generates more risk
- Familiarity with Technology: Less familiarity generates more risk
- Project Size: Large projects have more risk
- Compatibility: The harder it is to integrate the system with the company's existing technology, the higher the risk

Economic Feasibility: Should We Build It?

- Development costs
- Annual operating costs
- Annual benefits (cost savings and revenues)
- Intangible costs and benefits

Organizational Feasibility: If We Build It, Will They Come?

- Is the project strategically aligned with the business?
- Project champion(s)
- Senior management
- Users
- Other stakeholders

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Users' and analysts' lack of familiarity?

Uses technology that has not been used before within the organization?

Estimate with the technology that already exists in the organization

- *Number of people* on the development team
- *Length of time* it will take to complete the project
- *Number of distinct features* in the system
- Integrated with other systems?

- Need to compare the project with prior projects
- Consult with experienced IT professionals

Economic Feasibility: Should We Build It?

- Development costs
- Annual operating costs
- Annual benefits (cost savings and revenues)
- Intangible costs and benefits

Development Costs	Operational Costs
Development Team Salaries	Software Upgrades
Consultant Fees	Software Licensing Fees
Development Training	Hardware Repairs
Hardware and Software	Hardware Upgrades
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
Reductions in Staff	Increased Brand Recognition
Reductions in Inventory	Higher Quality Products
Reductions in IT Costs	Improved Customer Service
Better Supplier Prices	Better Supplier Relations

→ Make *cost-benefit analysis*

Cost-Benefit Analysis

	2015	2016	2017	2018	2019	Total
Increased sales	500,000	530,000	561,800	595,508	631,238	
Reduction in customer complaint calls	70,000	70,000	70,000	70,000	70,000	
Reduced inventory costs	68,000	68,000	68,000	68,000	68,000	
TOTAL BENEFITS:	638,000	668,000	699,800	733,508	769,238	
PV OF BENEFITS:	**619,417**	**629,654**	**640,416**	**651,712**	**663,552**	**3,204,752**
PV OF ALL BENEFITS:	**619,417**	**1,249,072**	**1,889,488**	**2,541,200**	**3,204,752**	
2 Servers @ $125,000	250,000	0	0	0	0	
Printer						
Software licenses						
Server software						
Development labor						
TOTAL DEVELOPMENT COSTS:						
Hardware						
Software						
Operational labor						
TOTAL OPERATIONAL COSTS:						
TOTAL COSTS:						
PV OF COSTS:						
PV OF ALL COSTS:						
TOTAL PROJECT BENEFITS COS						
YEARLY NPV:						
CUMULATIVE NPV:						

Break-even Point

RETURN ON INVESTMENT:	24.44%	(629,421/2,575,331)
BREAK-EVEN POINT:	3.63 years	[break-even occurs in year 4; (450,019 − 166,026)/450,019 = 0.63]
INTANGIBLE BENEFITS:		This service is currently provided by competitors Improved customer satisfaction

Organizational Feasibility: If We Build It, Will They Come?

- Is the project strategically aligned with the business?
- Project champion(s)
- Senior management
- Users
- Other stakeholders

	Role
Champion	A champion: • Initiates the project • Promotes the project • Allocates his or her time to project • Provides resources
Organizational Management	Organizational managers: • Know about the project • Budget enough money for the project • Encourage users to accept and use the system
System Users	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

- Project Selection:
  - Accept
  - Reject
  - Need to Review

- Criteria:
  - Suitable direction, maximum profit/cost, balance the gains and losses
  - Quantity and quality of other projects
  - Return on Investment value, Net present Value, break - even time

- [Once the committee has approved a project], projects enter the project management process
  - The *development team* must plan for the actual development of the system.

- Project management = process of planning and controlling the development of a system within a specific time frame at a minimum cost with the right functionality.
  - includes the discipline of planning, organizing, and managing resources to bring about the successful completion of specific project goals and objectives
- Project management:
  - Make work plan
  - Staffing the Project
  - Manage scope
  - Create timeboxing
  - etc.
- A project manager has the primary responsibility for managing the hundreds of tasks and roles that need to be carefully coordinated
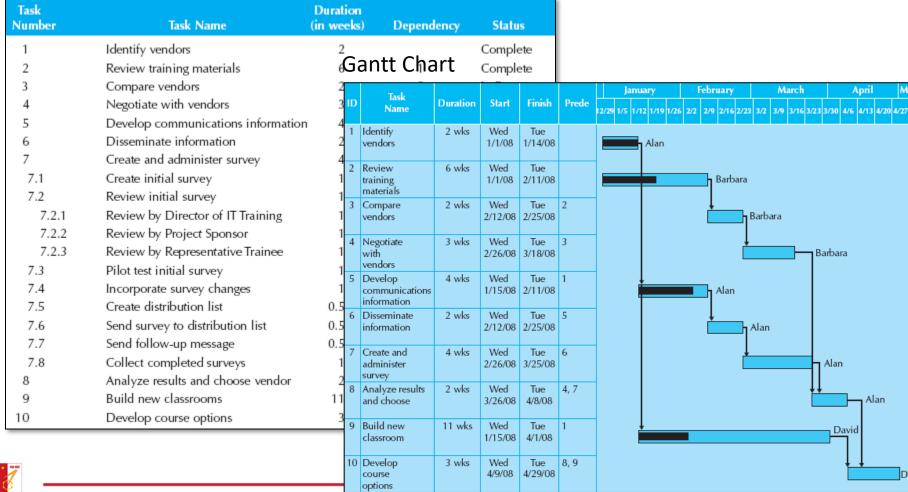
Cost + Schedule + Performance

- Dynamic schedule that records and keeps track of all **tasks**

Breakdown Structure

Task Number	Task Name	Duration (in weeks)	Dependency	Status
1	Identify vendors	2		Complete
2	Review training materials	6		Complete
3	Compare vendors	2		
4	Negotiate with vendors	3		
5	Develop communications information	4		
6	Disseminate information	2		
7	Create and administer survey	4		
7.1	Create initial survey	1		
7.2	Review initial survey	1		
7.2.1	Review by Director of IT Training	1		
7.2.2	Review by Project Sponsor	1		
7.2.3	Review by Representative Trainee	1		
7.3	Pilot test initial survey	1		
7.4	Incorporate survey changes	1		
7.5	Create distribution list	0.5		
7.6	Send survey to distribution list	0.5		
7.7	Send follow-up message	0.5		
7.8	Collect completed surveys	1		
8	Analyze results and choose vendor	2		
9	Build new classrooms	11		
10	Develop course options	3		

Gantt Chart

ID	Task Name	Duration	Start	Finish	Prede	January					February				March				April				M
						12/29	1/5	1/12	1/19	1/26	2/2	2/9	2/16	2/23	3/2	3/9	3/16	3/23	3/30	4/6	4/13	4/20	4/27
1	Identify vendors	2 wks	Wed 1/1/08	Tue 1/14/08		Alan																
2	Review training materials	6 wks	Wed 1/1/08	Tue 2/11/08		Barbara																
3	Compare vendors	2 wks	Wed 2/12/08	Tue 2/25/08	2	Barbara																
4	Negotiate with vendors	3 wks	Wed 2/26/08	Tue 3/18/08	3	Barbara																
5	Develop communications information	4 wks	Wed 1/15/08	Tue 2/11/08	1	Alan																
6	Disseminate information	2 wks	Wed 2/12/08	Tue 2/25/08	5	Alan																
7	Create and administer survey	4 wks	Wed 2/26/08	Tue 3/25/08	6	Alan																
8	Analyze results and choose	2 wks	Wed 3/26/08	Tue 4/8/08	4, 7	Alan																
9	Build new classroom	11 wks	Wed 1/15/08	Tue 4/1/08	1	David																
10	Develop course options	3 wks	Wed 4/9/08	Tue 4/29/08	8, 9	D																

- Determine average number of people needed
- Staffing plan
    - List the required locations for the project
    - Determine the organizational structure of the project
    - Choose the right people for the positions (technical skills, interpersonal skills)
    - Encourage, motivate and orient the whole team towards the project's goals
    - Resolving conflicts that may arise between members
- Note:
    - Divide total person-months of effort by the optimal schedule
    - Adding more people will not reduce schedule

- Scope creep happens when new requirements are added to the projects after the original project scope was defined and frozen
- Why
  - User realize new functionality that would be useful
  - Developers might discover interesting capabilities
  - Senior manager might decide to let this system support a new strategy

- Sets a fixed deadline for a project and delivers the system by that deadline no matter what, even if functionality needs to be reduced.

- Steps
  1. Set the date of delivery for the proposed goals
  2. Build the core of the system to be delivered
  3. A high-quality system is delivered
  4. Future iterations will be needed to make changes and enhancements, go to step 1.

- Clearly define roles and project plans
- Make sure the team understands how the project is important to the organization
- Develop detailed operating procedures and communicate these to the team members
- Develop a project charter
- Develop schedule commitments ahead of time
- Forecast other priorities and their possible impact on project
- Risk management

- CASE (Computer-Aided Software Engineering) Tools
  - A category of software that automates all or part of the software development process (diagram tools, project management tools, design tools, programming tools, QA tools, etc.)
  - Support the communication
  - Sharing of project diagrams and technical specifications
  - Reduced maintenance costs, Improve software quality, Enforce discipline, etc.
- Standards
  - Apply Documentation standards, Coding standards, Procedural standards, Specification requirement standards, User interface design standards
- Documentation
  - All internal communications, written standards, letters to and from the business users, deliverables from each task, etc.