



MSc Information Systems

Planning – I

Project Identification and Project Management

Module SITS code: COIY059H7

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Introduction

- A project is a set of activities with a **specified beginning and end point** intended to create a system that brings value to the business
- Project Management is the process of planning and controlling an IS project within a specified time and budget
- Project Managers monitor and control all tasks and roles that need to be coordinated
- Project Management starts by defining the project in response to a business need or opportunity

Project Identification

- Projects are driven by business needs
 - Identified by business people
 - Identified by IT people
 - (best) identified jointly by business and IT
- The project sponsor - normally a business person - believes in the system and wants to see it succeed
- The project sponsor should have the authority to move the project forward

- Tangible Value
 - Can be quantified and measured directly
 - Example: 2 percent reduction in operating costs
- Intangible Value
 - We know it will add value & save time, but we may not be able to quantify or measure its benefits
 - Example: improved customer service
- Imperative
 - We need to do it for regulatory or other mandatory reasons
 - Example: Y2K

System Request

- A document that describes the reasons for and the value added from building a new system
- Contains:
 - Project sponsor: the primary point of contact for the project
 - Business need: the reason prompting the project
 - Business requirements: what the system will do
 - Business value: how will the organization benefit from the project
 - Special issues: anything else that should be considered

Feasibility Analysis

- Is this project feasible?
- What are the risks?
- Can these risks be overcome?
- Major components:
 - Technical feasibility (***Can we build it?***)
 - Economic feasibility (***Should we build it?***)
 - Organisational feasibility (***Will they use it?***)

Technical Feasibility

- Functional: are analysts familiar with this portion of the business?
- Technical: Is this new or unfamiliar technology?
- Scale: Is the project of a manageable size?
- Compatibility: will there be many components to integrate?

Economic Feasibility (Cost-Benefit Analysis)

- Identify and assign value to costs and the benefits
- Determine the cash flow
- Determine the value using :
 - Net present value (NPV)
 - Return on investment (ROI)
 - Break-even point analysis

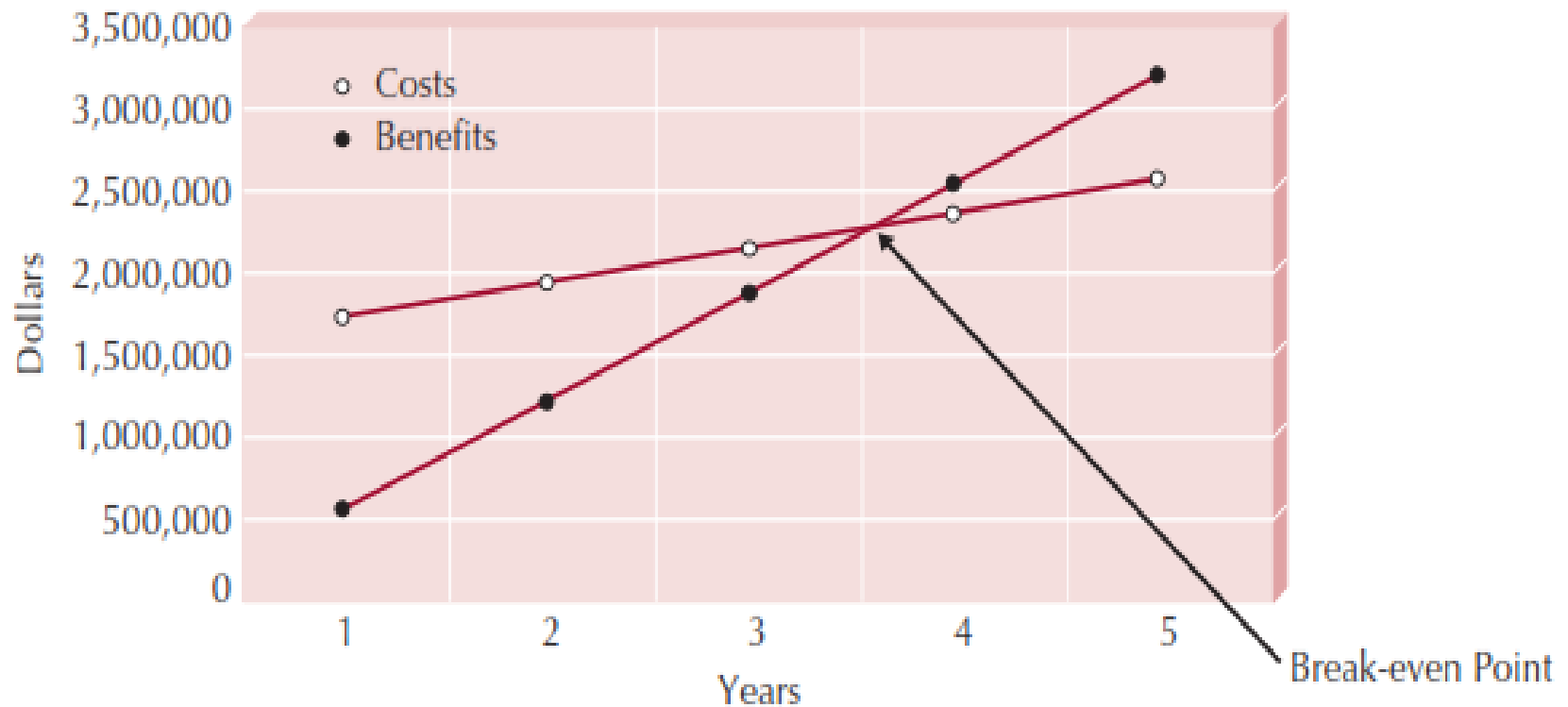
Formulas for Determining Value

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.	$\frac{\text{Amount}}{(1 + \text{interest rate})^n}$ <p>n = number of years in future</p>
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.	$\frac{\text{Yearly NPV}^* - \text{Cumulative NPV}}{\text{Yearly NPV}^*}$ <p>*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.</p>

Example Cost Benefit Analysis

	2008	2009	2010	2011	2012	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	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	
Hardware	54,000	81,261	81,261	81,261	81,261	
Software	20,000	20,000	20,000	20,000	20,000	
Operational labor	111,788	116,260	120,910	125,746	130,776	
TOTAL OPERATIONAL COSTS:	185,788	217,521	222,171	227,007	232,037	
TOTAL COSTS:	1,818,083	217,521	222,171	227,007	232,037	
PV OF COSTS:	1,765,129	205,034	203,318	201,693	200,157	2,575,331
PV OF ALL COSTS:	1,765,129	1,970,163	2,173,481	2,375,174	2,575,331	
TOTAL PROJECT BENEFITS – COSTS:	(1,180,083)	450,479	477,629	506,501	537,201	
YEARLY NPV:	(1,145,712)	424,620	437,098	450,019	463,395	629,421
CUMULATIVE NPV:	(1,145,712)	(721,091)	(283,993)	166,026	629,421	
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					

Example Break-even Point



Organisational Feasibility

- Will the users accept the system?
- Is the project strategically aligned with the business?
- Is there an obvious senior project champion(s)?
- Have all stakeholders been identified and involved?
- Is the management pre-disposed to adopting a new system?

Project Selection

- Projects are approved, declined or delayed based on value added vs. risks
- Project portfolio management goals:
 - Maximise cost/benefit ratio
 - Maintain an optimal mix of projects based on risk; size, cost & length of time to complete; business value
- Limited resources require trade-offs
- Selected projects enter the project management process

- Work plans (tasks, sequence, time to complete)
 - Work breakdown structures (WBS): a hierarchy of tasks identifying duration, status dependencies
 - Gantt chart: horizontal bar chart that shows the WBS graphically
 - PERT chart: describes tasks and status

PERT Chart

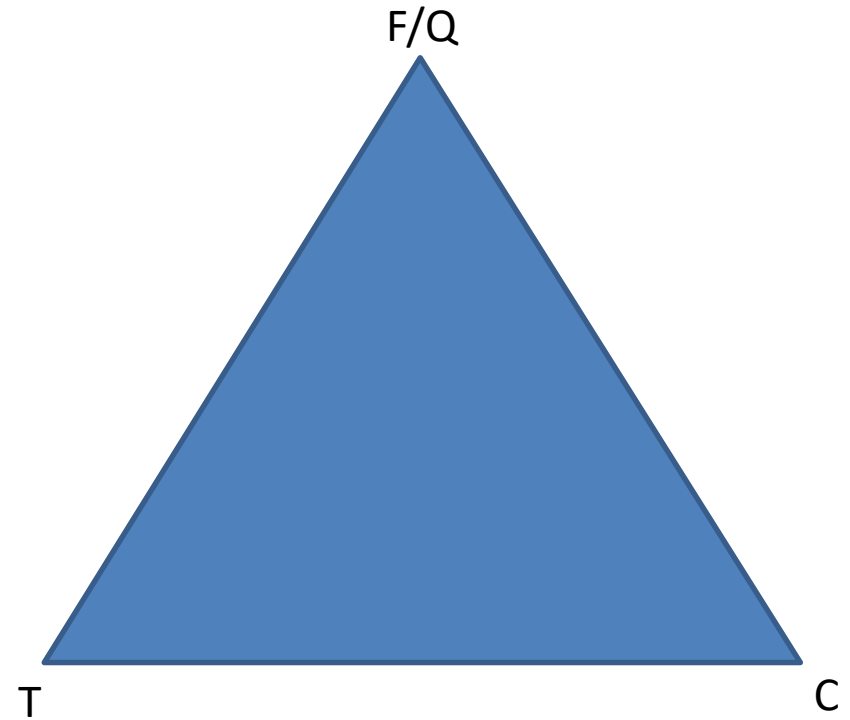
Early Start	Duration	Early Finish
Task Name		
Late Start	Slack	Late Finish

Gaant Chart

ID	Task Name	Start	Finish	Duration	Oct 2016													
					1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Task 1	03/10/2016	03/10/2016	1d														
2	Task 2	03/10/2016	03/10/2016	1d														
3	Task 3	03/10/2016	03/10/2016	1d														
4	Task 4	03/10/2016	03/10/2016	1d														
5	Task 5	03/10/2016	03/10/2016	1d														

Project Effort Estimation

- Estimation involves trade-offs between Functionality/Quality, Time and Cost
- It is the process of assigning projected values for time and effort
- Most accurate estimates come from **experience**
- Use-case point method; based on technical complexity factors (13) and environmental factors (8)



Use Case Estimation Example

Unadjusted Actor Weighting Table:				
Actor Type	Description	Weighting Factor	Number	Result
Simple	External system with well-defined API	1	0	0
Average	External system using a protocol-based interface, e.g., HTTP, TCT/IP, or a database	2	0	0
Complex	Human	3	4	12
<i>Unadjusted Actor Weight Total (UAW)</i>				12
Unadjusted Use-Case Weighting Table:				
Use Case Type	Description	Weighting Factor	Number	Result
Simple	1–3 transactions	5	3	15
Average	4–7 transactions	10	4	40
Complex	>7 transactions	15	1	15
<i>Unadjusted Use Case Weight Total (UUCW)</i>				70
<i>Unadjusted Use-Case Points (UUCP) = UAW + UUCW 82 = 12 + 70</i>				

Use Case Estimation Example

Technical Complexity Factors:					
Factor Number	Description	Weight	Assigned Value (0 – 5)	Weighted Value	Notes
T1	Distributed system	2.0	0	0	
T2	Response time or throughput performance objectives	1.0	5	5	
T3	End-user online efficiency	1.0	3	3	
T4	Complex internal processing	1.0	1	1	
T5	Reusability of code	1.0	1	1	
T6	Ease of installation	0.5	2	1	
T7	Ease of use	0.5	4	2	
T8	Portability	2.0	0	0	
T9	Ease of change	1.0	2	2	
T10	Concurrency	1.0	0	0	
T11	Special security objectives included	1.0	0	0	
T12	Direct access for third parties	1.0	0	0	
T13	Special user training required	1.0	0	0	
Technical Factor Value (TFactor)				15	
Technical Complexity Factor (TCF) = $0.6 + (0.01 * TFactor)$ $0.75 = 0.6 + (0.01 * 15)$					

Use Case Estimation Example

Environmental Factors:					
Factor Number	Description	Weight	Assigned Value (0 – 5)	Weighted Value	Notes
E1	Familiarity with system development process being used	1.5	4	6	
E2	Application experience	0.5	4	2	
E3	Object-oriented experience	1.0	4	4	
E4	Lead analyst capability	0.5	5	2.5	
E5	Motivation	1.0	5	5	
E6	Requirements stability	2.0	5	10	
E7	Part-time staff	-1.0	0	0	
E8	Difficulty of programming language	-1.0	4	-4.0	
Environmental Factor Value (EFactor)				25.5	
$\text{Environmental Factor (EF)} = 1.4 + (-0.03 * \text{EFactor}) \quad 0.635 = 1.4 + (-0.03 * 25.5)$ $\text{Adjusted Use Case Points (UCP)} = \text{UUCP} * \text{TCF} * \text{ECF} \quad 33.3375 = 70 * 0.75 * 0.635$ $\text{Effort in person-hours} = \text{UCP} * \text{PHM} \quad 666.75 = 20 * 33.3375$					

Creating and Managing the Work Plan

- Work plan: dynamic, sequential list of tasks needed to complete a project
- Work plans depend on the methodology used
- Unified Process:
 - Workflows are the major divisions
 - Workflows are decomposed along the phases
 - Phases are decomposed along the required tasks
 - Tasks are added as each iteration is completed
- In Agile methodologies, the work plan is determined by the backlog

Scope Management

- Scope “creep”
 - Occurs after the project is underway
 - Results from adding new requirements to the project
 - Can derail the schedule
- Techniques to manage the project scope:
 - Identify all requirements at the outset
 - Allow only those changes deemed absolutely necessary
 - Carefully examine the impact of suggested changes
 - Delay some changes for “future enhancements”
 - Time boxing

- Determine how many people are required
- Match skill sets to required activities
- Motivate the team to meet the objectives
- Minimize conflicts
- Write a staffing plan:
 - number & kind of people assigned
 - overall reporting structure
 - project charter (project's objectives and rules)

Staffing Plan

- Determine skills and numbers of people, and timing for skills
- Create a reporting structure for projects with large numbers of people assigned
- Assign the Project Manager, Functional lead & Technical lead
- Lines of communication increase exponentially as people are added to a project
- Pay attention to technical and interpersonal skills

Motivating People

- Monetary rewards usually do not motivate
- **Motivation** is the greatest influence on performance
 - Peer-to-peer recognition awards
 - Allow members to focus on what interests them
 - Utilize equitable compensation
 - Encourage group ownership
 - Provide for autonomy, but trust the team to deliver

Handling Conflict

- Preventing or mitigating conflict:
 - Cohesiveness has the greatest effect
 - Clearly defining roles and holding team members accountable
 - Establish work & communications rules in the project charter
- Additional techniques:
 - Clearly define plans for the project
 - Make sure the team understands the importance of the project
 - Develop detailed operating procedures
 - Develop a project charter
 - Develop a schedule of commitments in advance
 - Forecast other priorities and their impact on the project

References

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