

Project Initiation and Selection

- Unit 3 -

Agenda

- Quick review: Cost-Benefit Analysis and ROI Analysis
- Case Study 1 Discussion
- Today's business IT environment
- IT Project portfolio
- Project feasibility study and business case evaluation
- Multi-criteria decision analysis – project portfolio selection example

Return On Investment (ROI) Analysis

Part of feasibility study

Business benefits must justify costs and Information System investments for:

Development Projects

- *Developing, implementing and maintaining a new information system*

Acquisition Projects

- Acquiring, implementing and maintaining a new information system

Maintenance Projects

- Maintaining and improving an existing information system

IT Auditors are required to confirm information systems the business chooses to rely on:

1. Meet return on investment (ROI) expectations
2. Are planned, developed, implemented and maintained in a controlled and dependable manner

Cost-Benefit Analysis and Return On Investment (ROI) Analysis

- Preliminary budget of a Feasibility Study should outline planned expenses and revenues associated with the proposed project
- Project justification for a viable project should demonstrate benefits are worth the costs
- Net Present Value calculation illustrates project's:
 - Benefits and costs
 - Return on Investment (ROI)
 - Cash flow analysis

	Dicount Rate: 0.12 <small>Enter Discount Rate as decimal (E.g. 0.10 for 10%)</small>					
Year:	0	1	2	3	4	5
Benefit	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Discount Rate	1.00	0.89	0.80	0.71	0.64	0.57
PV of Benefits	\$ -	\$ 44,642.86	\$ 39,859.69	\$ 35,589.01	\$ 31,775.90	\$ 28,371.34
NPV of Benefits	\$ -	\$ 44,642.86	\$ 84,502.55	\$ 120,091.56	\$ 151,867.47	\$ 180,238.81
Costs	\$ (42,500.00)	\$ (28,500.00)	\$ (28,500.00)	\$ (28,500.00)	\$ (28,500.00)	\$ (45,000.00)
Discount Rate	1.00	0.89	0.80	0.71	0.64	0.57
PV of Costs	\$ (42,500.00)	\$ (25,446.43)	\$ (22,720.03)	\$ (20,285.74)	\$ (18,112.27)	\$ (25,534.21)
NPV of Costs	\$ (42,500.00)	\$ (67,946.43)	\$ (90,666.45)	\$ (110,952.19)	\$ (129,064.46)	\$ (154,598.66)
Net Present Value (NPV):	\$ (42,500.00)	\$ (23,303.57)	\$ (6,163.90)	\$ 9,139.37	\$ 22,803.01	\$ 25,640.15
ROI:	-100.00%	-34.30%	-6.80%	8.24%	17.67%	16.58%
Cash Flow (Yearly)	\$ (42,500.00)	\$ 19,196.43	\$ 17,139.67	\$ 15,303.28	\$ 13,663.64	\$ 2,837.13
Cash Flow (Overall)	\$ (42,500.00)	\$ (23,303.57)	\$ (6,163.90)	\$ 9,139.37	\$ 22,803.01	\$ 25,640.15
Break Even Ratio:				0.40		
Break-even occurs in 2.40 years						

Case Study Question 1

- Practice using the [CalculateProjectNPV B.xlsx](#) spreadsheet to calculate costs and benefits for the Customer Tracking System (Pine Valley Furniture) as you read Chapter 5 in Modern Systems Analysis and Design (MSAD). Apply the spreadsheet to illustrate cost/benefit analysis, including: Cash flow analysis, use of Net Present Value (NPV) in calculating Return on Investment (ROI), and break-even analysis

TANGIBLE BENEFITS WORKSHEET
Customer Tracking System Project

Year 1 through 5

A. Cost reduction or avoidance	\$ 4,500
B. Error reduction	2,500
C. Increased flexibility	7,500
D. Increased speed of activity	10,500
E. Improvement in management planning or control	25,000
F. Other _____	0
TOTAL tangible benefits	\$50,000

ONE-TIME COSTS WORKSHEET
Customer Tracking System Project

Year 0

A. Development costs	\$20,000
B. New hardware	15,000
C. New (purchased) software, if any	
1. Packaged applications software	5,000
2. Other _____	0
D. User training	2,500
E. Site preparation	0
F. Other _____	0
TOTAL one-time costs	\$42,500

RECURRING COSTS WORKSHEET
Customer Tracking System Project

Year 1 through 5

A. Application software maintenance	\$25,000
B. Incremental data storage required: 20 GB \$50 (estimated cost/GB = \$50)	1000
C. Incremental communications (lines, messages, . . .)	2000
D. New software or hardware leases	0
E. Supplies	500
F. Other _____	0
TOTAL recurring costs	\$28,500

Case Study Question 1

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Break-even occurs in 2.40 years							

Evaluating your use of costs and benefits relevant to the Pine Valley Furniture case background information...

Net Present Value (NPV)

A useful tool to determine whether a project or investment will result in a net profit or a loss

- Determined by calculating the costs (negative cash flow) and benefits (positive cash flow) for each period of an investment
- After the cash flow for each period is calculated
 - The present value (PV) of each one is achieved by discounting its future value at a periodic rate of return (dictated by the market)
 - NPV is the sum of all the discounted future cash flows.

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$$PV = \frac{R_t}{(1+i)^t}$$

where

t – the time of the cash flow

i – the discount rate,

R_t – the net cash flow

$$NPV \text{ Discount Rate} = \frac{1}{(1+i)^t}$$

Given the (period, cash flow) pairs (t, R_t) where N is the total number of periods

$$NPV(i, N) = \sum_{t=0}^N \frac{R_t}{(1+i)^t}$$

Teradata Data Mart Consolidation Case Study

1. Business discovery

Understand the business, and review cost and benefits the new technology project is expected to deliver

2. Base situation

Did they determine costs if firm continues its operations without implementing the technology project?

- *These will be treated as benefits if cost of operations of legacy systems are stopped to switchover to new system*

3. Project cost

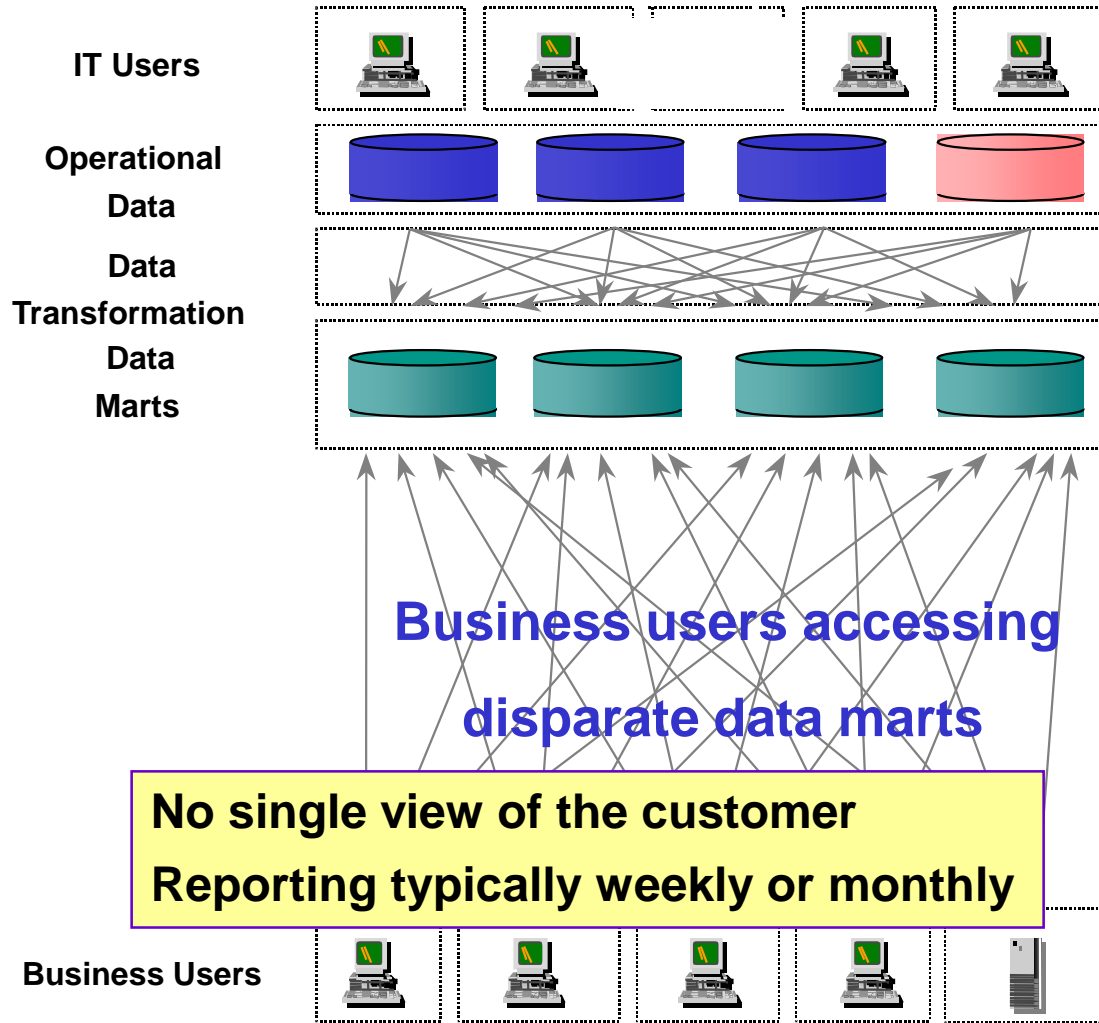
Did they determine cost of implementing the new technology project?

- Did they determine initial cost?
- Did they determine recurring and maintenance costs?

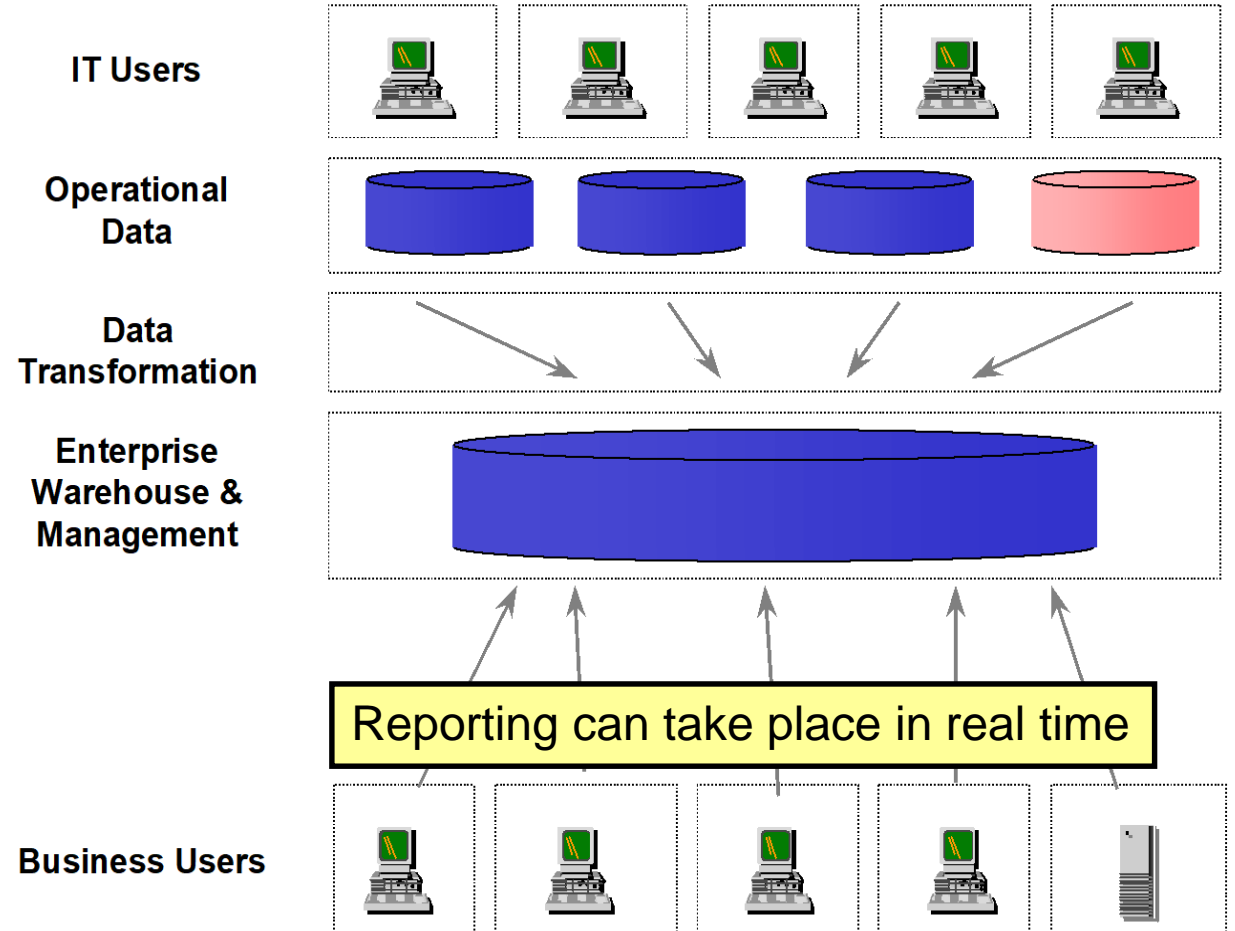
4. Return On Investment

Did they determine payback period and breakeven point?

As Is: Isolated Data Mart Architecture



To Be: Enterprise Data Warehouse



Annual cost of legacy systems

<u>Costs of Existing Resources</u>	Salaries for each position	Oracle		IBM		Total
			Totals for each position		Totals for each position	
System administrator	\$ 130,000	1	\$ 130,000	1	\$ 130,000	\$ 260,000
Database analyst	\$ 110,000	2	\$ 220,000	3	\$ 330,000	\$ 550,000
ETL programmer	\$ 80,000	2	\$ 160,000	2	\$ 160,000	\$ 320,000
Query programmer	\$ 70,000	3	\$ 210,000	3	\$ 210,000	\$ 420,000
Network administrator	\$ 80,000	1	\$ 80,000	1	\$ 80,000	\$ 160,000
Support staff	\$ 40,000	2	\$ 80,000	2	\$ 80,000	\$ 160,000
Total annual salary & benefits cost/system			\$ 1,232,000		\$ 1,386,000	\$ 2,618,000
Nonpersonnel support/system			1,000,000		1,800,000	\$ 2,800,000
Total salary and benefits/system			2,232,000		3,186,000	\$ 5,418,000
Number of systems			4		1	\$ 5
Total yearly costs personnel + support			8,928,000		3,186,000	\$ 12,114,000

...these costs become benefits of switching to the new system, i.e. costs not incurred after replacement

Likely Implementation time / Likely Personnel

Teradata Solution Costs

Assumptions		
30% discount = 70% of list price		70%
Total disk cost (this cost has no discount)	\$	650,000
Equipment credit due at delivery	\$	400,000
Hardware & Software Costs		
Node	Hardware	Software
1st Node	\$ 175,000	\$ 90,000
2nd Node	\$ 225,000	\$ 190,000
3rd Node	\$ 200,000	\$ 190,000
4th Node	\$ 200,000	\$ 190,000
5th Node	\$ 720,000	\$ 500,000
6th Node	\$ 720,000	\$ 500,000
Total list price costs	\$ 2,240,000	\$ 1,660,000
Price with 30% HW discount	\$ 1,568,000	\$ 1,162,000
Disk costs	\$ 650,000	
Equipment credit	\$ (400,000)	\$ -
Total price	\$ 1,818,000	\$ 1,162,000
Total HW & SW w/ discounts	\$ 2,980,000	

Costs of Resources		Best	Likely	Worst	
System administrator	\$ 130,000	1	\$ 130,000	1	\$ 130,000
Database analyst	\$ 110,000	6	\$ 660,000	8	\$ 990,000
ETL programmer	\$ 80,000	3	\$ 240,000	4	\$ 640,000
Query programmer	\$ 70,000	8	\$ 560,000	10	\$ 1,050,000
Network administrator	\$ 80,000	0	\$ -	0	\$ -
Support staff	\$ 40,000	2	\$ 80,000	3	\$ 160,000
Total annual salary & benefits cost/system			\$ 2,338,000	\$ 3,010,000	\$ 4,158,000
Number of systems			1	1	1
Total salary and benefits			\$ 2,338,000	\$ 3,010,000	\$ 4,158,000
Nonpersonnel support			\$ 1,500,000	\$ 1,500,000	\$ 1,500,000
Total yearly costs personnel + support			\$ 3,838,000	\$ 4,510,000	\$ 5,658,000
Total average monthly costs			\$ 319,833	\$ 375,833	\$ 471,500

Costs for the Teradata Solution: “...The exact probabilities for the GST Staffing changes were not known; however, the GST team urged Davis to use 20 percent/60 percent/20 percent as probabilities for the best, most likely, and worst staffing scenarios, respectively.”

The 20-60-20 Rule
Piotr Jaworski*, Marcin Pitera†,
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Abstract
In this paper we discuss an empirical phenomena known as the 20-60-20 rule. It says that if we

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Abstract
In this paper we discuss an empirical phenomena known as the 20-60-20 rule. It says that if we split the population into three groups, according to some arbitrary benchmark criterion, then this particular ratio implies some sort of balance. From practical point of view, this feature often leads to efficient management or control. We provide a mathematical illustration, justifying the occurrence of this rule in many real world situations. We show that for any population, which could be described using multivariate normal vector, this fixed ratio leads to a global equilibrium state, when dispersion and linear dependence measurement is considered.

Keywords: 20-60-20 Rule, 60/20/20 Principle, 20:60:20, Pareto principle, law of the vital few, the principle of factor sparsity, truncated normal distribution, conditional elliptic distribution.

MSC2010: 60K30, 91B10, 91B14, 91B52, 60A86, 62A86,

*Corporations use the 20-60-20 rule widely in management and sales departments [15, 13]. One of the practical aspects of this phenomena relates to the fact that different procedures and methods are created to handle the efficiency in positive, negative and neutral group and the 20-60-20 ratio proves to be the most efficient partition. For example, in many problems related to human resource management, one should identify and focus his attention on the middle 60%, as this group could and should be managed efficiently.

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*Institute of Mathematics, Jagiellonian University, Cracow, Poland.

“While very popular among practitioners, no scientific evidence of the 20-60-20 principle has been presented yet, due to the authors knowledge. Consequently, this noteworthy rule become more of a slogan, than the scientific fact.”

ROI Calculation – Costs of old versus new

<i>Cost Comparison</i>	Year 0	Year 1	Year 2	Year 3
<u>Old Configuration</u>				
Salary		6,314,000	6,566,560	6,829,222
Training				
Professional Services (consulting)				
Maintenance/upgrades		430,000	430,000	430,000
Non-personnel support		5,800,000	6,090,000	6,394,000
Total	0	12,544,000	13,086,560	13,653,222
<u>New Configuration</u>				
Salary		4,662,000	3,130,400	3,255,616
Training		90,000	180,000	90,000
Professional Services (consulting)			1,500,000	1,500,000
Maintenance/upgrades		430,000	390,000	390,000
Non-personnel support		3,650,000	1,575,000	1,653,750
Total	0	8,832,000	6,775,400	6,889,366
New System (1-time Cost)	7,720,000			
Incremental Cash Flow	-7,720,000	3,712,000	6,311,160	6,763,856

ROI Calculation – NPV, ROI and Break-even analysis

	Dicount Rate:		0.12	Enter Discount Rate as decimal (E.g. 0.12 for 12%)
Year:	0	1	2	3
Benefit	\$ -	\$ 12,544,000.00	\$ 13,086,560.00	\$ 13,653,722.00
Discount Rate	1.00	0.89	0.80	0.71
PV of Benefits	\$ -	\$ 11,200,000.00	\$ 10,432,525.51	\$ 9,718,449.63
NPV of Benefits	\$ -	\$ 11,200,000.00	\$ 21,632,525.51	\$ 31,350,975.14
Costs	\$ (7,720,000.00)	\$ (8,832,000.00)	\$ (6,775,400.00)	\$ (6,889,366.00)
Discount Rate	1.00	0.89	0.80	0.71
PV of Costs	\$ (7,720,000.00)	\$ (7,885,714.29)	\$ (5,401,307.40)	\$ (4,903,714.64)
NPV of Costs	\$ (7,720,000.00)	\$ (15,605,714.29)	\$ (21,007,021.68)	\$ (25,910,736.32)
Net Present Value (NPV):	\$ (7,720,000.00)	\$ (4,405,714.29)	\$ 625,503.83	\$ 5,440,238.82
ROI:	-100.00%	-28.23%	2.98%	21.00%
Cash Flow (Yearly)	\$ (7,720,000.00)	\$ 3,314,285.71	\$ 5,031,218.11	\$ 4,814,734.99
Cash Flow (Overall)	\$ (7,720,000.00)	\$ (4,405,714.29)	\$ 625,503.83	\$ 5,440,238.82
Break Even Ratio:			0.88	
Break-even occurs in 1.88 years				

ROI Calculation – NPV, ROI, and Break-even analysis

	Dicount Rate:		0.14	Enter Discount Rate as decimal (E.g. 0.12 for 12%)
Year:	0	1	2	3
Benefit	\$ -	\$ 12,544,000.00	\$ 13,086,560.00	\$ 13,653,722.00
Discount Rate	1.00	0.88	0.77	0.67
PV of Benefits	\$ -	\$ 11,003,508.77	\$ 10,069,682.98	\$ 9,215,873.44
NPV of Benefits	\$ -	\$ 11,003,508.77	\$ 21,073,191.75	\$ 30,289,065.19
Costs	\$ (7,720,000.00)	\$ (8,832,000.00)	\$ (6,775,400.00)	\$ (6,889,366.00)
Discount Rate	1.00	0.88	0.77	0.67
PV of Costs	\$ (7,720,000.00)	\$ (7,747,368.42)	\$ (5,213,450.29)	\$ (4,650,125.81)
NPV of Costs	\$ (7,720,000.00)	\$ (15,467,368.42)	\$ (20,680,818.71)	\$ (25,330,944.53)
Net Present Value (NPV):	\$ (7,720,000.00)	\$ (4,463,859.65)	\$ 392,373.04	\$ 4,958,120.66
ROI:	-100.00%	-28.86%	1.90%	19.57%
Cash Flow (Yearly)	\$ (7,720,000.00)	\$ 3,256,140.35	\$ 4,856,232.69	\$ 4,565,747.63
Cash Flow (Overall)	\$ (7,720,000.00)	\$ (4,463,859.65)	\$ 392,373.04	\$ 4,958,120.66
Break Even Ratio:			0.92	
Break-even occurs in 1.92 years				

Cost Structure Associated with Implementation of Data Warehouse—July 1st Abandon Data Marts													
	December	January	February	March	April	May	June	July	August	September	October	November	December
Nodes, software, disks	\$ 2,980,000												
Professional services		\$ 220,000	\$ 255,000	\$ 270,000	\$ 290,000	\$ 290,000	\$ 290,000	\$ 270,000	\$ 270,000	\$ 270,000	\$ 270,000	\$ 270,000	\$ 270,000
Overlapping salary—Old configuration		\$ 250,833	\$ 250,833	\$ 250,833	\$ 250,833	\$ 250,833	\$ 250,833						
Monthly total	\$ 2,980,000	\$ 470,833	\$ 505,833	\$ 520,833	\$ 540,833	\$ 540,833	\$ 540,833	\$ 270,000	\$ 270,000	\$ 270,000	\$ 270,000	\$ 270,000	\$ 270,000
Investment cash outflow at T=0 = Depreciable basis													\$ 7,720,000

ROI Calculation				
	Year 0	Year 1	Year 2	Year 3
Old Configuration				
Salary & benefits		\$ 6,314,000	\$ 6,566,560	\$ 6,829,222
Training		\$ -	\$ -	\$ -
Professional services (consulting)		\$ -	\$ -	\$ -
Maintenance/upgrades		\$ 430,000	\$ 430,000	\$ 430,000
Nonpersonnel support		\$ 5,800,000	\$ 6,090,000	\$ 6,394,500
Total		\$ 12,544,000	\$ 13,086,560	\$ 13,653,722
times (1 – tax rate)		\$ 7,777,280	\$ 8,113,667	\$ 8,465,308
less tax rate times depreciation		\$ -	\$ -	\$ -
Total		\$ 7,777,280	\$ 8,113,667	\$ 8,465,308
New Configuration				
Salary & benefits		\$ 4,662,000	\$ 3,130,400	\$ 3,255,616
Training		\$ 90,000	\$ 180,000	\$ 90,000
Professional services (consulting)		\$ -	\$ 1,500,000	\$ 1,500,000
Maintenance/upgrades		\$ 430,000	\$ 390,000	\$ 390,000
Nonpersonnel support		\$ 3,650,000	\$ 1,575,000	\$ 1,653,750
Total		\$ 8,832,000	\$ 6,775,400	\$ 6,889,366
times (1 – tax rate)		\$ 5,475,840	\$ 4,200,748	\$ 4,271,407
less tax rate times depreciation		\$ (586,720)	\$ (938,752)	\$ (1,408,128)
Total		\$ 4,889,120	\$ 3,261,996	\$ 2,863,279
Incremental cash flow	\$ (7,720,000)	\$ 2,888,160	\$ 4,851,671	\$ 5,602,029
Cumulative cash flow		\$ (4,831,840)	\$ 19,831	\$ 5,621,860

	Dicount Rate: 0.12 Enter Discount Rate c			
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Benefit	\$ -	\$ 7,777,280.00	\$ 8,113,667.00	\$ 8,465,308.00
Discount Rate	1.00	0.89	0.80	0.71
PV of Benefits	\$ -	\$ 6,944,000.00	\$ 6,468,165.66	\$ 6,025,439.03
NPV of Benefits	\$ -	\$ 6,944,000.00	\$ 13,412,165.66	\$ 19,437,604.68
Costs	\$ (7,720,000.00)	\$ (4,889,120.00)	\$ (3,261,996.00)	\$ (2,863,279.00)
Discount Rate	1.00	0.89	0.80	0.71
PV of Costs	\$ (7,720,000.00)	\$ (4,365,285.71)	\$ (2,600,443.24)	\$ (2,038,025.44)
NPV of Costs	\$ (7,720,000.00)	\$ (12,085,285.71)	\$ (14,685,728.95)	\$ (16,723,754.39)
Net Present Value (NPV):	\$ (7,720,000.00)	\$ (5,141,285.71)	\$ (1,273,563.30)	\$ 2,713,850.29
ROI:	-100.00%	-42.54%	-8.67%	16.23%
Cash Flow (Yearly)	\$ (7,720,000.00)	\$ 2,578,714.29	\$ 3,867,722.42	\$ 3,987,413.59
Cash Flow (Overall)	\$ (7,720,000.00)	\$ (5,141,285.71)	\$ (1,273,563.30)	\$ 2,713,850.29
Break Even Ratio:				0.32
Break-even occurs in 2.32 years				

ROI Analysis with “soft” benefits

Should the firm approve funding this project?

Qualitative benefits

- Enhanced operational effectiveness
- Improved decision making
- Improved customer service

Quantitative benefits

- Savings in legacy systems
- Reduction in inventories
- Productivity improvements
- Etc.

One-time benefit
Long-term benefit

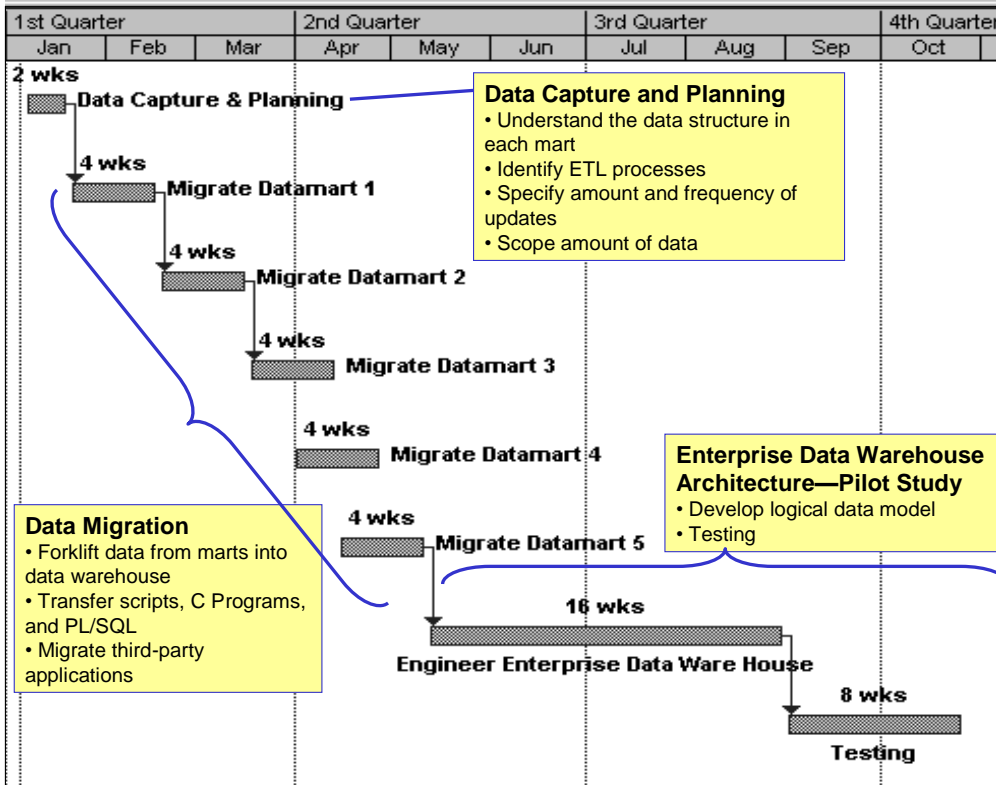
Costs

- Technology costs
- Implementation costs (internal/external)
- “Switching” costs

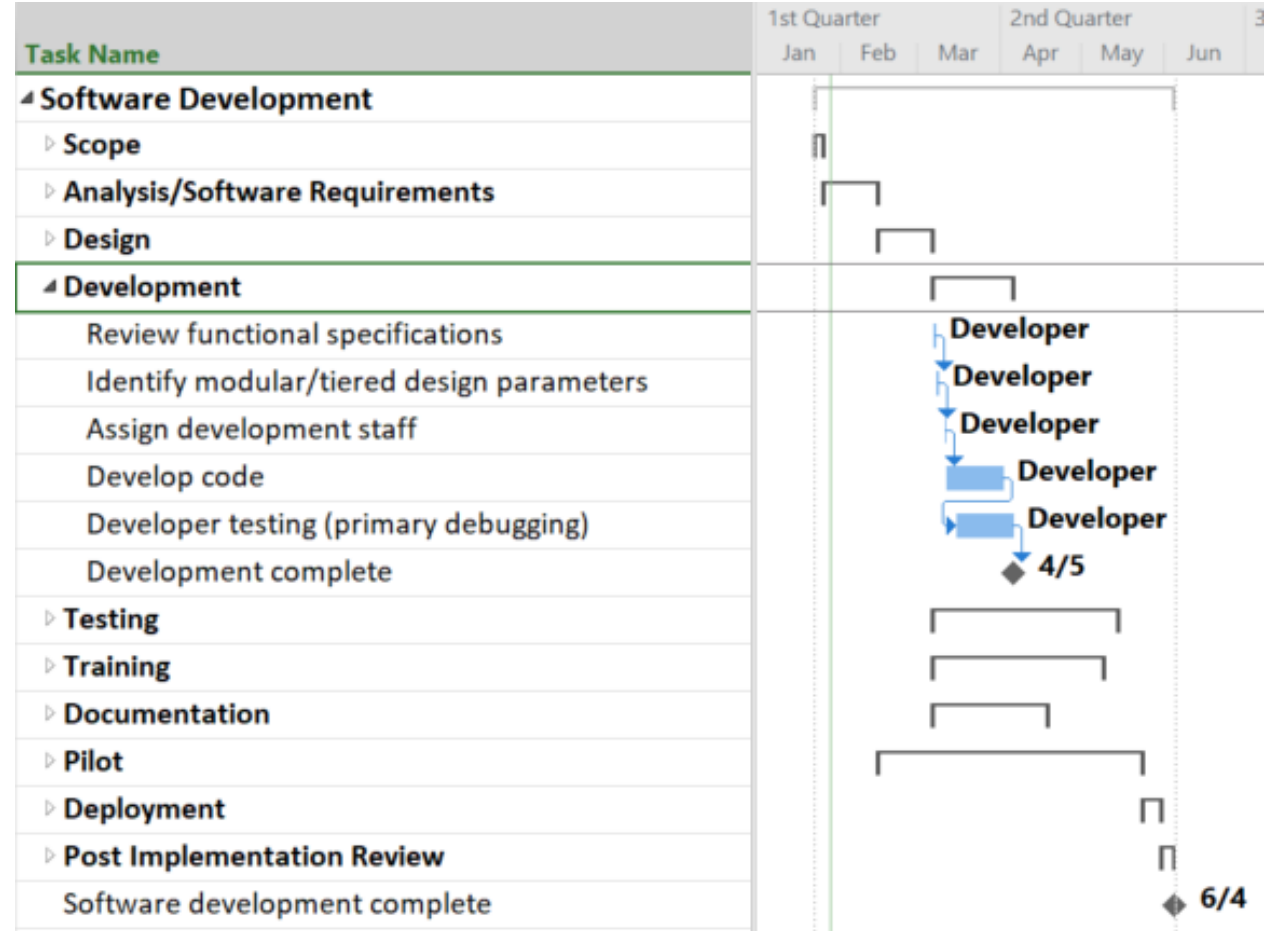
One-time costs
Recurring costs

Assess based on NPV, ROI and Break-even analysis

Question: How does the MS project structure compare with that of the case study?



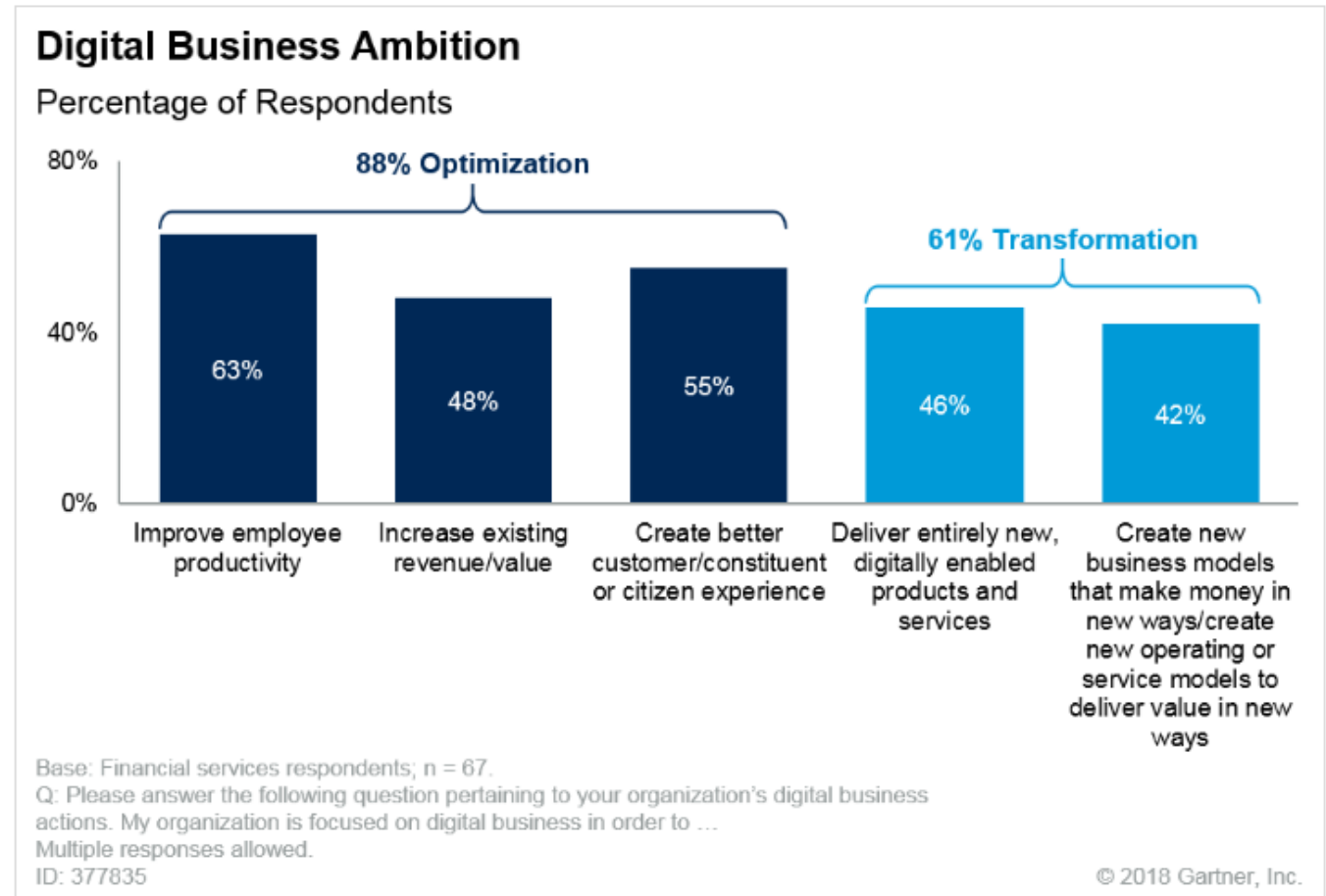
- COTS implementation versus software dev
- Software Dev lacks any mention of data...
- Data mart has optimistic testing at end...



Today's Business IT Environment

It is impossible for enterprises of any size in any market sector to exist without computers to assist in business operations

- Computer revolution started in the 1950's continues...
- Equipment capacity and performance continues to grow while cost and size is shrinking
- Today's focus is on developing and implementing more effective and responsive information systems that optimize and transform the business



Source: Gartner (December 2018)

Information System Proposals

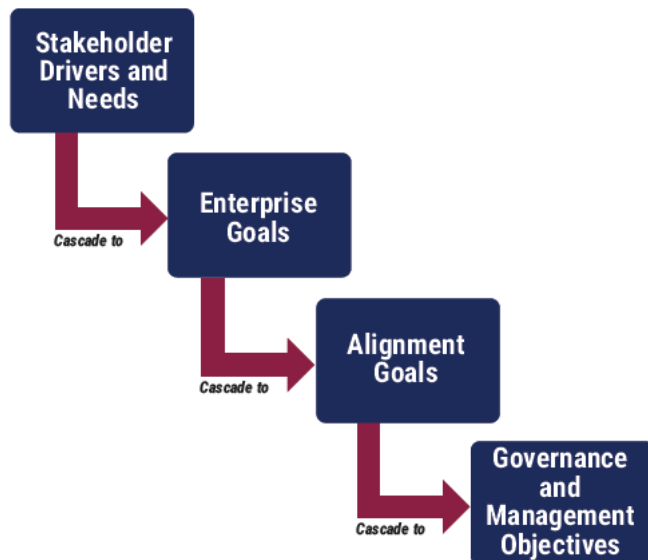
Proposals for new information systems come from a variety of sources, for example, they may come from:

- Board of Directors as a result of a business change
- Government in the form of legislative and regulatory changes
- Management initiatives intended to...
 - Improve business effectiveness or efficiencies
 - Respond to competitive forces
- Information Technology which has changed

Enterprise Governance of Information and Technology

Enterprise governance of new and improved information and technology is focused on:

1. **Benefits Realization**
2. **Risk Optimization**
3. **Resource Optimization**



COBIT 2019 Framework: Introduction & Methodology, ISACA, 2018

Enterprise Governance of Information and Technology

1. Benefits Realization

- Creating value for the enterprise through IT:
 - Maintaining and increasing value derived from existing IT investments
 - Eliminating IT initiatives and assets that are not creating sufficient value
- Delivery of fit-for-purpose services and solutions
 - On-time and within budget
 - That generate the intended financial and nonfinancial benefits
- Value that IT delivers should be
 - Aligned directly with targeted business values
 - Measured in ways that show impact and contributions of IT-enabled investments

COBIT 2019 Framework: Introduction & Methodology, ISACA, 2018

Enterprise Governance of Information and Technology

2. Risk Optimization

- Addresses business risk associated with use, ownership, operation, involvement, influence and adoption of IT within the enterprise
- IT-related business risk consists of IT-related events that could potentially impact the business
- While value delivery focuses on creation of value, risk management focuses on the preservation of value

COBIT 2019 Framework: Introduction & Methodology, ISACA, 2018

Enterprise Governance of Information and Technology

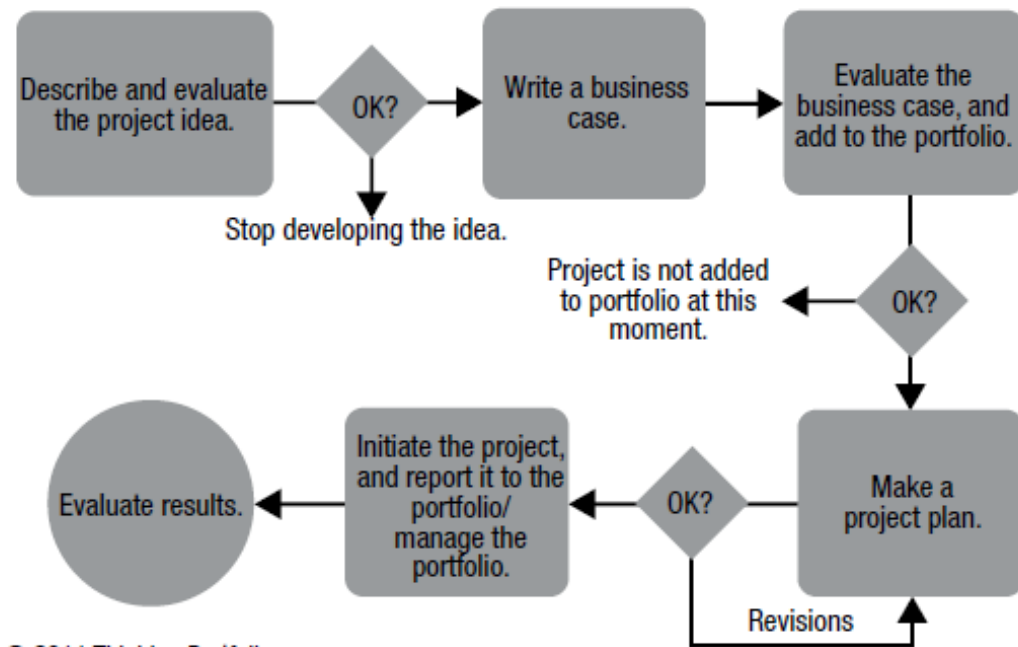
3. Resource Optimization

- Recognizes
 - Data and information are an important resources
 - Exploiting data and information to gain optimal value is a key focus
- Ensures
 - Appropriate capabilities are in place to execute the strategic plan
 - Sufficient, appropriate and effective resources are provided
 - An integrated, economical IT infrastructure is provided
 - New technology is introduced as required by the business
 - Obsolete systems are updated or replaced

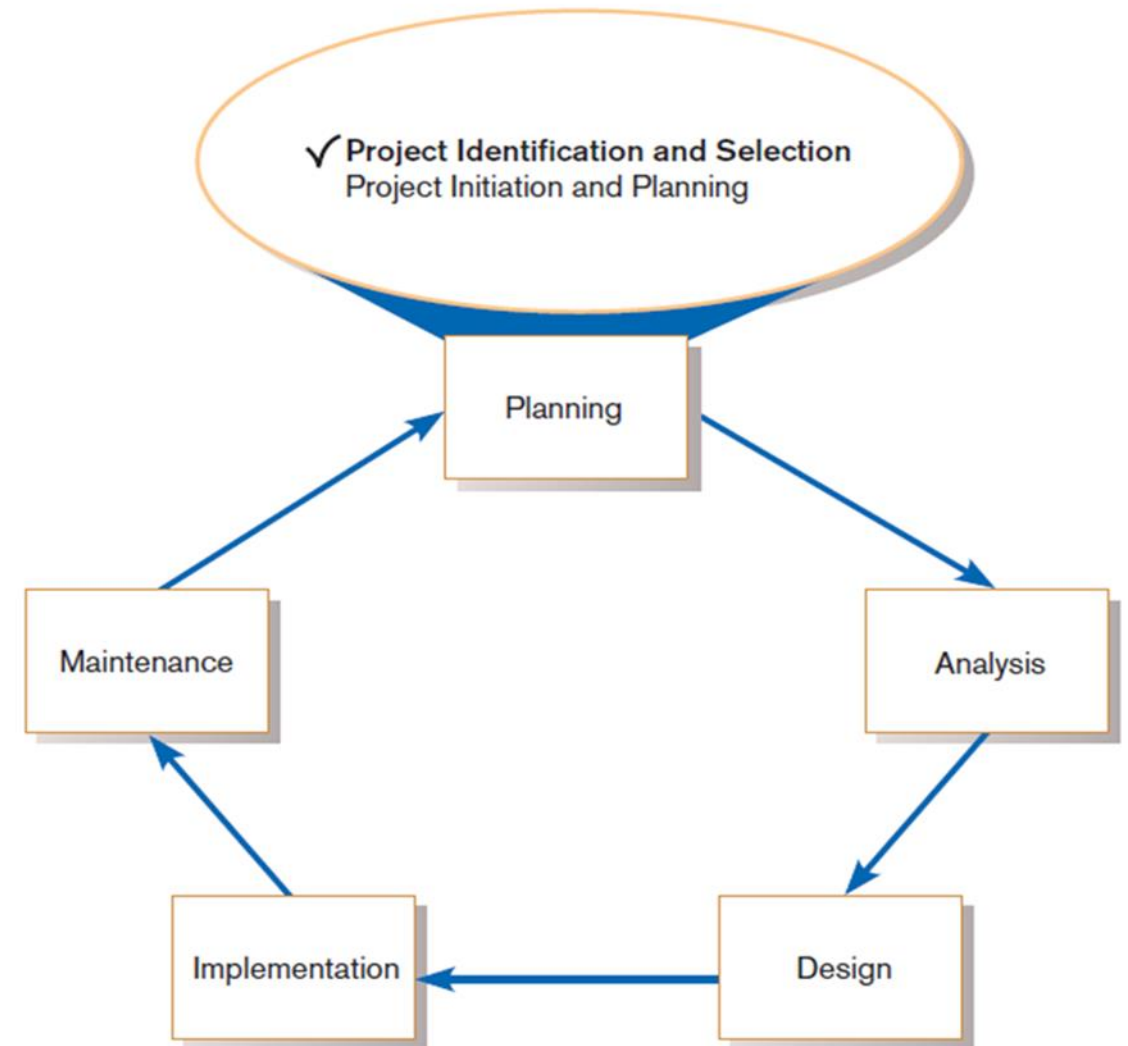
COBIT 2019 Framework: Introduction & Methodology, ISACA, 2018

IS Development/Implementation Project Portfolio

1. Identify potential development projects
2. Classify and rank projects
3. Select portfolio of projects to fund



© 2011 Thinking Portfolio



Selecting IS Development/Implementation Projects

Each stakeholder group brings their own perspective and motivation to IS project selection

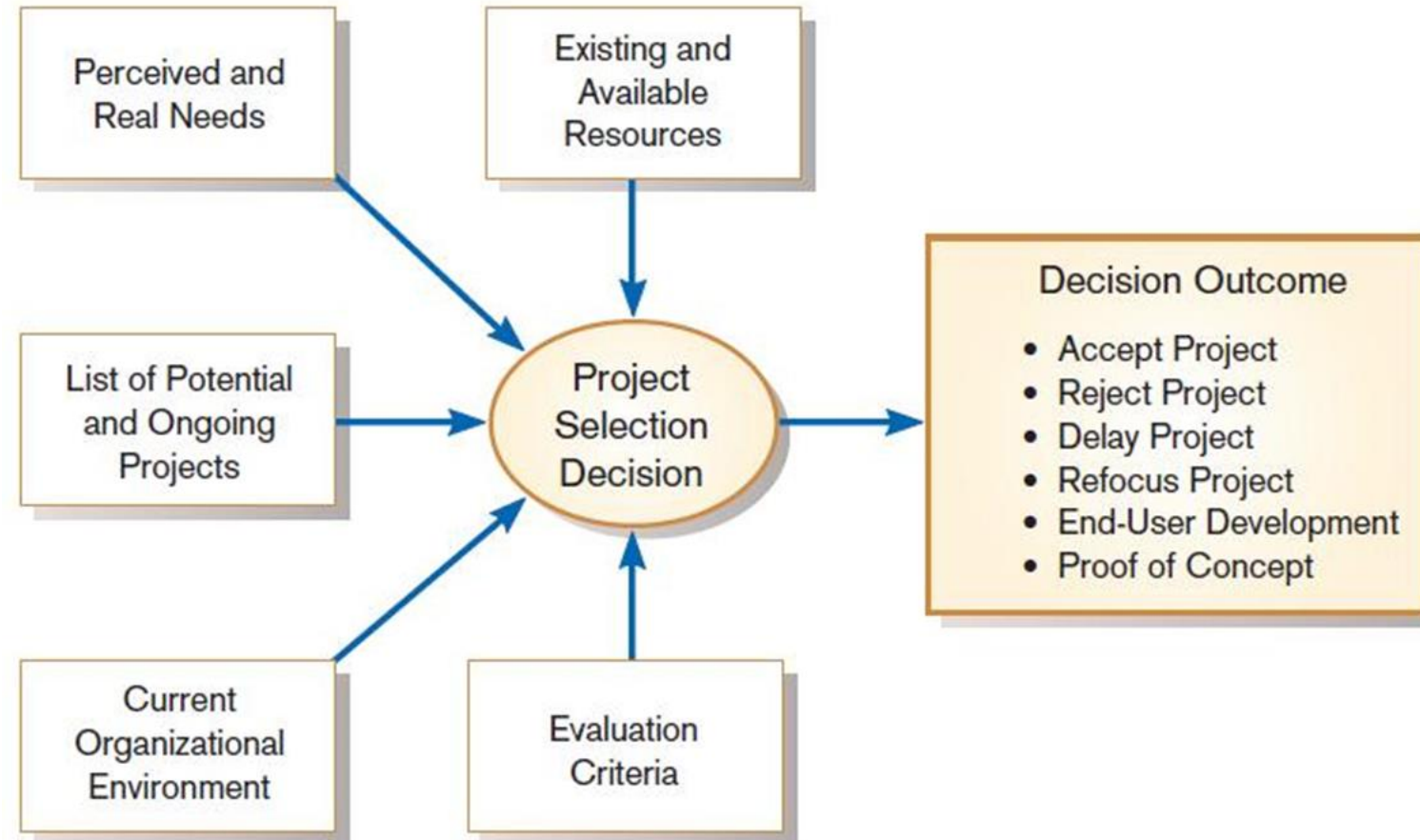
- **Top-down:** Projects identified by top management or by a diverse steering committee
- **Bottom-up:** Project initiatives stem from managers, business units, or the development group
- **Mixed:** The process varies across projects selected by the organization

Characteristics of Projects

...based on who makes selection decision

Selection Method	Characteristics
Top Management	Greater strategic focus Largest project size Longest project duration Enterprise-wide consideration
Steering Committee	Cross-functional focus Greater organizational change Formal cost-benefit analysis Larger and riskier projects
Functional Area	Narrow, nonstrategic focus Faster development Fewer users, management layers, and business functions involved
Development Group	Integration with existing systems focus Fewer development delays Less concern with cost-benefit analysis

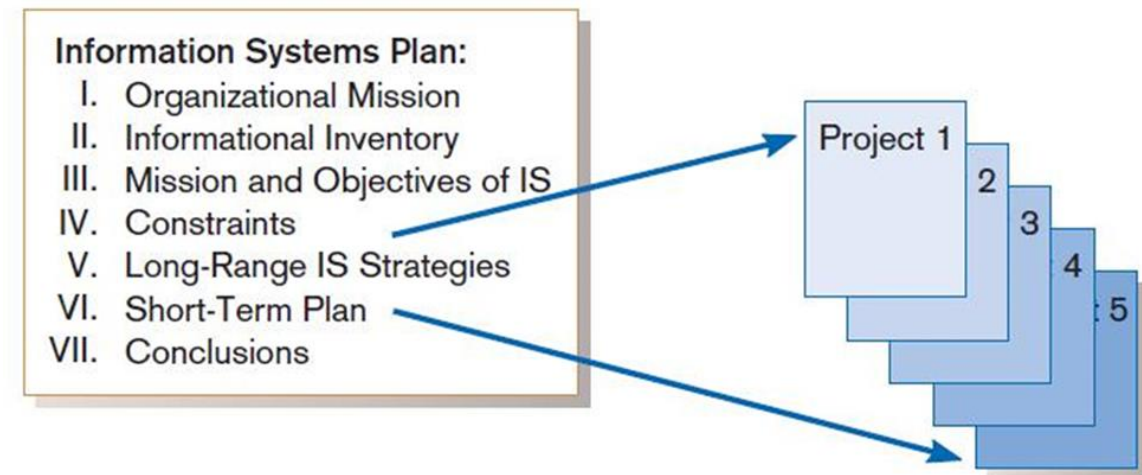
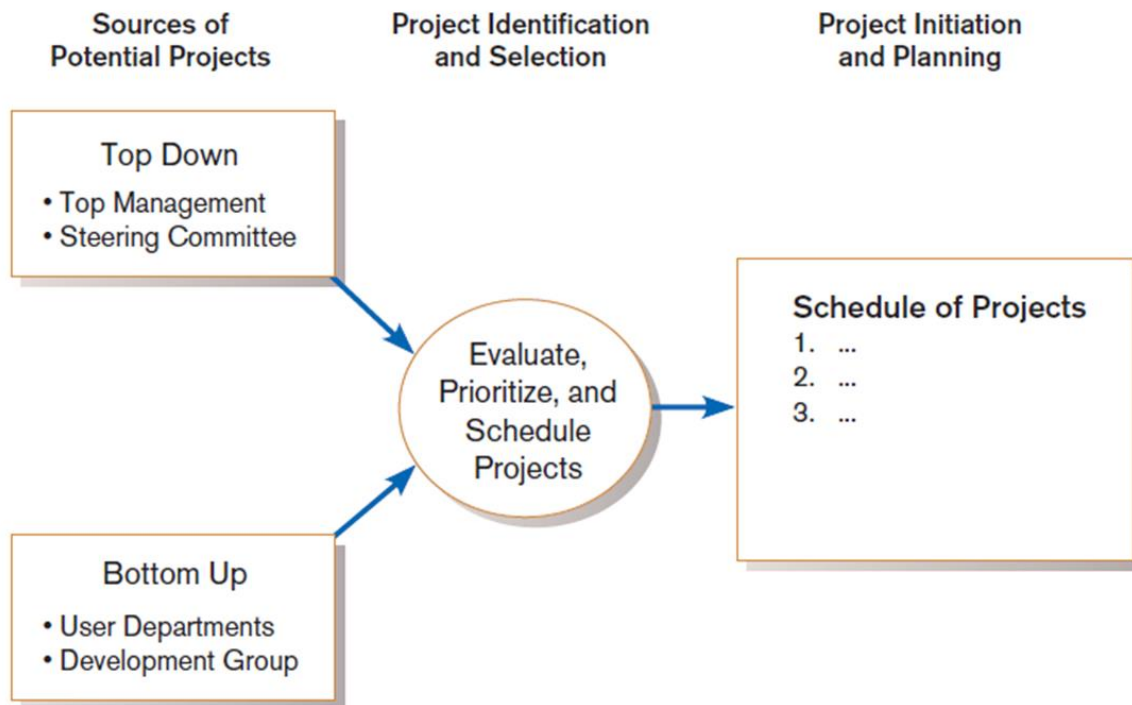
Project Selection Must Consider Many Factors



Different Kinds of Project Evaluation Criteria

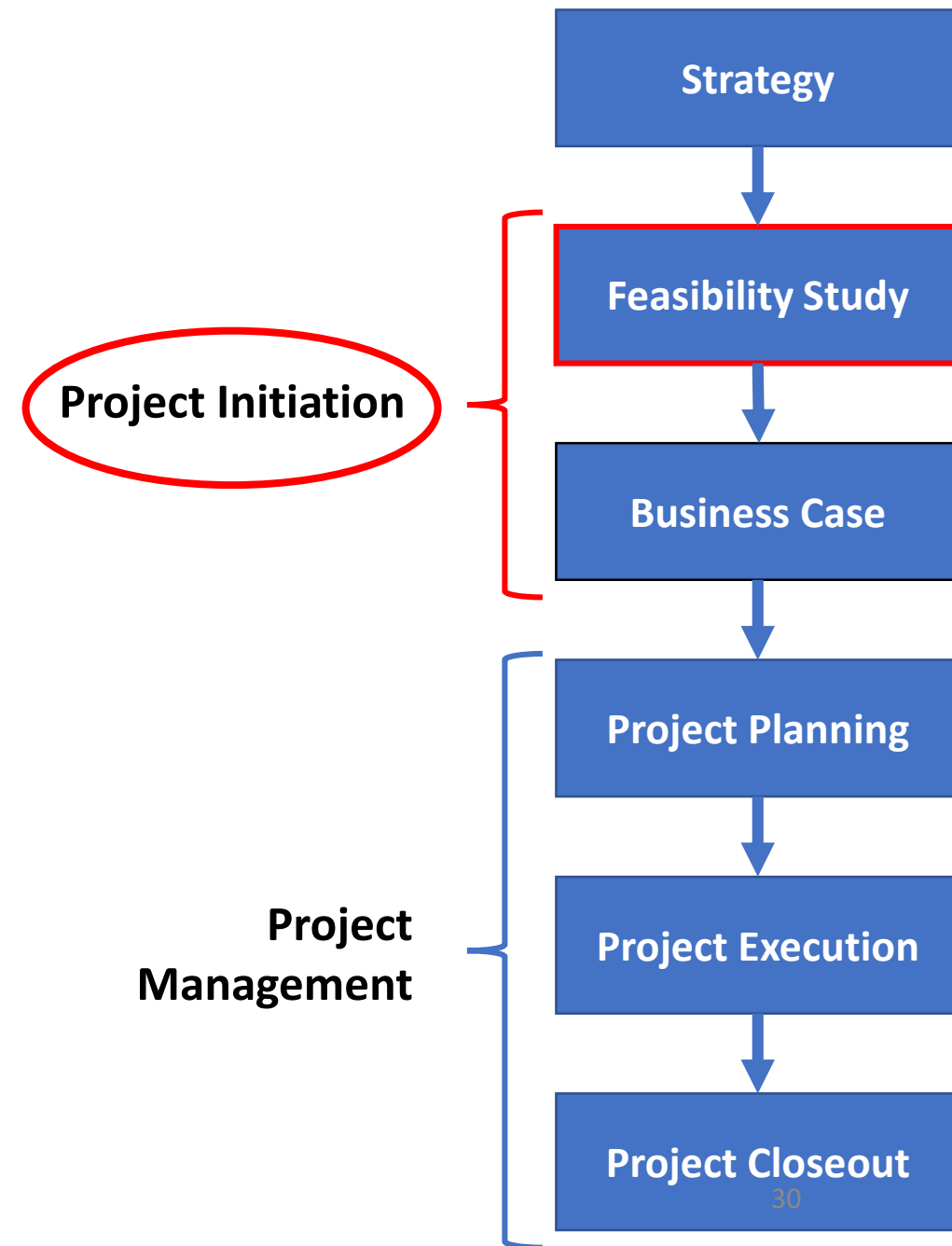
Evaluation Criteria	Description
Value Chain Analysis	Extent to which activities add value and costs when developing products and/or services
Strategic Alignment	Extent to which the project is viewed as helping the organization achieve its strategic objectives and long-term goals
Potential Benefits	Extent to which the project is viewed as improving profits, customer service, and so forth, and the duration of these benefits
Resource Availability	Amount and type of resources the project requires and their availability
Project Size/Duration	Number of individuals and the length of time needed to complete the project
Technical Difficulty/Risks	Level of technical difficulty to successfully complete the project within given time and resource constraints

Projects selection and prioritization for funding and scheduling



IS Project Business Case Development and Approval

*The **Feasibility Study** assesses if a solution for the new information system is practical and can meet requirements within an established budget and schedule*



IT Audit's Role in a Feasibility Study

Focuses on the probability of a successful outcome of an IT project

1. Overall desirability of a information system from a corporate perspective
2. Likelihood of successful implementation

IT Auditor's role is to protect against insufficient attention paid at this stage

...which can result in the development or acquisition of expensive, inappropriate systems that do not fully address IT requirements of the organization

- Little expenditure has been made at this stage – a wrong decision can lead to many millions being invested to little effect and loss of significant time in gaining strategic advantage
- Many feasibility studies are conducted to support a go-head decision that has already been made whether or not there are clear benefits, tangible or intangible, and whether or not there are unacceptable risks in either the development process or implementation of the intended system

An acceptable finding of the feasibility study could be not to proceed with any system development or acquisition

Typical Structure of a Feasibility Study

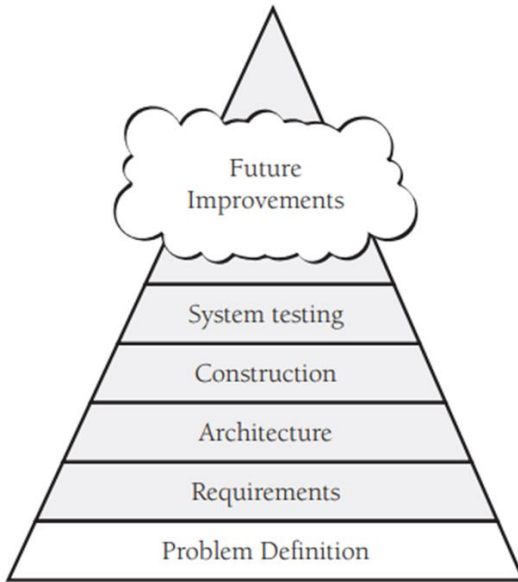
- **Executive summary:** business objectives, anticipated costs, expected benefits and possible risks of the proposed investment
- **Business background:** Needs or opportunities leading to the desire for the new or improved information system including any statutory requirements
- **Service delivery requirements and impacts** on existing IT processing as well as other user functional areas
- **Business disruptions** anticipated as a result of the development, conversion, and implementation process including the acquisition or training of staff within the user area
- **Analysis of Alternatives**
 - Evaluation criteria used to select among alternatives
 - Technological alternatives considered together with the cost-benefit analysis of each
 - Analysis of alternative courses of actions compared to the selection criteria
 - Analysis of the costs and benefits associated with each alternative
 - Operational, security, and control risks associated with each alternative together with the control structures considered for risk minimization of each
- **Proposed solution** in terms of specific deliverables, SDLC methodology and technical tools required to support the solution, changes to business processes and organizational structures required to support the implementation of the eventual system
- **Project organization**, roles and responsibilities; major project phases and estimated time frame; as well as proposed: controls; quality assurance strategies
- **Cost-benefit analysis** proving the viability and desirability of the proposed solution
- **Ongoing maintenance plan** together with costs and resource requirements once the system has been fully implemented

“Buy versus Build” Alternatives

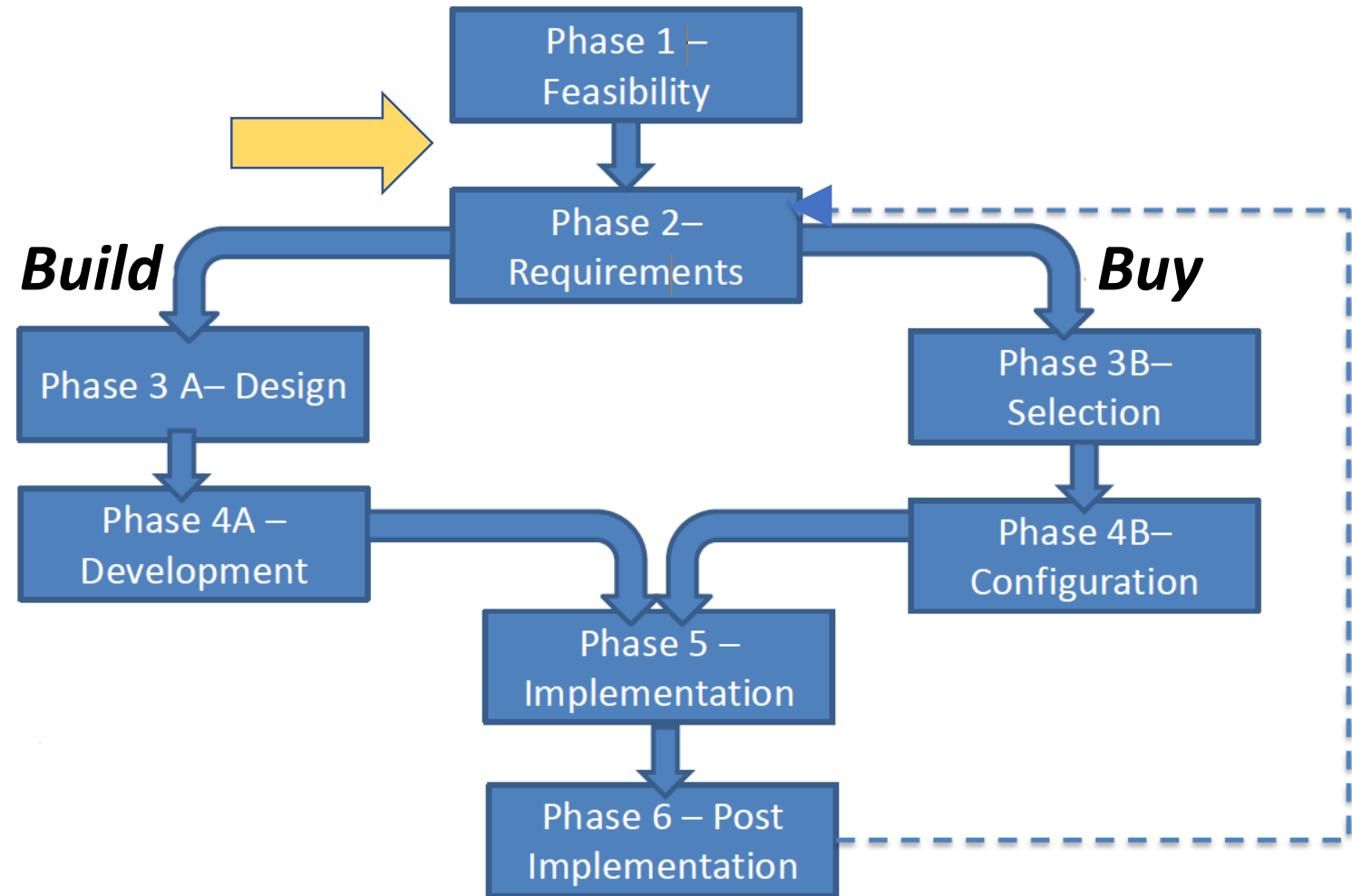
Are often based on the following considerations:

- Availability of commercial off the shelf (COTS) system alternatives
- Compatibility of COTS system with
 - Strategic business plans
 - Organizational IT infrastructure
- Cost of development versus cost of buying
 - Including long term licensing and maintenance needs
- Ability to make changes to meet future requirements
- Timing when system needs to be functional
- Skills and availability of human resources

IT Auditor reviews deliverables at the end of each phase acting as “stage gate”



Problem definition during Phase 1 lays the foundation for the rest of the process



In-Class Activity

Meet in IT Audit Teams

- Assess Alan's Best Chocolates (ABC) eCommerce Platform Feasibility Study
- Present findings to class

<https://www.projectmanagementdocs.com/template/project-initiation/feasibility-study/#axzz5dxZ4yoE1>



Cost-Benefit Analysis and Return On Investment (ROI) Analysis

- Preliminary budget of a Feasibility Study should outline planned expenses and revenues associated with the proposed project
- Project justification for a viable project should demonstrate benefits are worth the costs
- Net Present Value calculation illustrates project's:
 - Benefits and costs
 - Return on Investment (ROI)
 - Cash flow analysis

	Dicount Rate:			
			0.1	Enter Discount Rate as decimal (E.g. 0.10 for 10%)
Year:	0	1	2	3
Benefit	\$ 350,000.00	\$ 425,000.00	\$ 500,000.00	\$ 650,000.00
Discount Rate	1.00	0.91	0.83	0.75
PV of Benefits	\$ 350,000.00	\$ 386,363.64	\$ 413,223.14	\$ 488,354.62
NPV of Benefits	\$ 350,000.00	\$ 736,363.64	\$ 1,149,586.78	\$ 1,637,941.40
Costs	\$ (399,000.00)	\$ (253,000.00)	\$ (300,000.00)	\$ (348,000.00)
Discount Rate	1.00	0.91	0.83	0.75
PV of Costs	\$ (399,000.00)	\$ (230,000.00)	\$ (247,933.88)	\$ (261,457.55)
NPV of Costs	\$ (399,000.00)	\$ (629,000.00)	\$ (876,933.88)	\$ (1,138,391.44)
Net Present Value (NPV):	\$ (49,000.00)	\$ 107,363.64	\$ 272,652.89	\$ 499,549.96
ROI:	-12.28%	17.07%	31.09%	43.88%
Cash Flow (Yearly)	\$ (49,000.00)	\$ 156,363.64	\$ 165,289.26	\$ 226,897.07
Cash Flow (Overall)	\$ (49,000.00)	\$ 107,363.64	\$ 272,652.89	\$ 499,549.96
Break Even Ratio:		0.31		
Break-even occurs in 1.31 years				

Alan's Best Chocolate Ecommerce Platform Feasibility Study

Request for Information (RFI)

Document used to gather information from vendors or suppliers to compare products or services offered by businesses required to complete a project

RFIs are used to collect summary information to inform the next step of the decision process, not detailed bids or work proposals

RFI typically precedes a request for proposal (RFP)

- RFP is a formal comprehensive request for proposal
 - Usually with intension of
 - Purchasing a COTS information system and implementation services, or
 - Purchasing services to develop and implement the Information system
- RFP provides details about the scope of the project being undertaken, the timeline and budget, and the requirements that a vendor needs to meet

Analysis of Alternative Project Solutions with Multicriteria Analysis

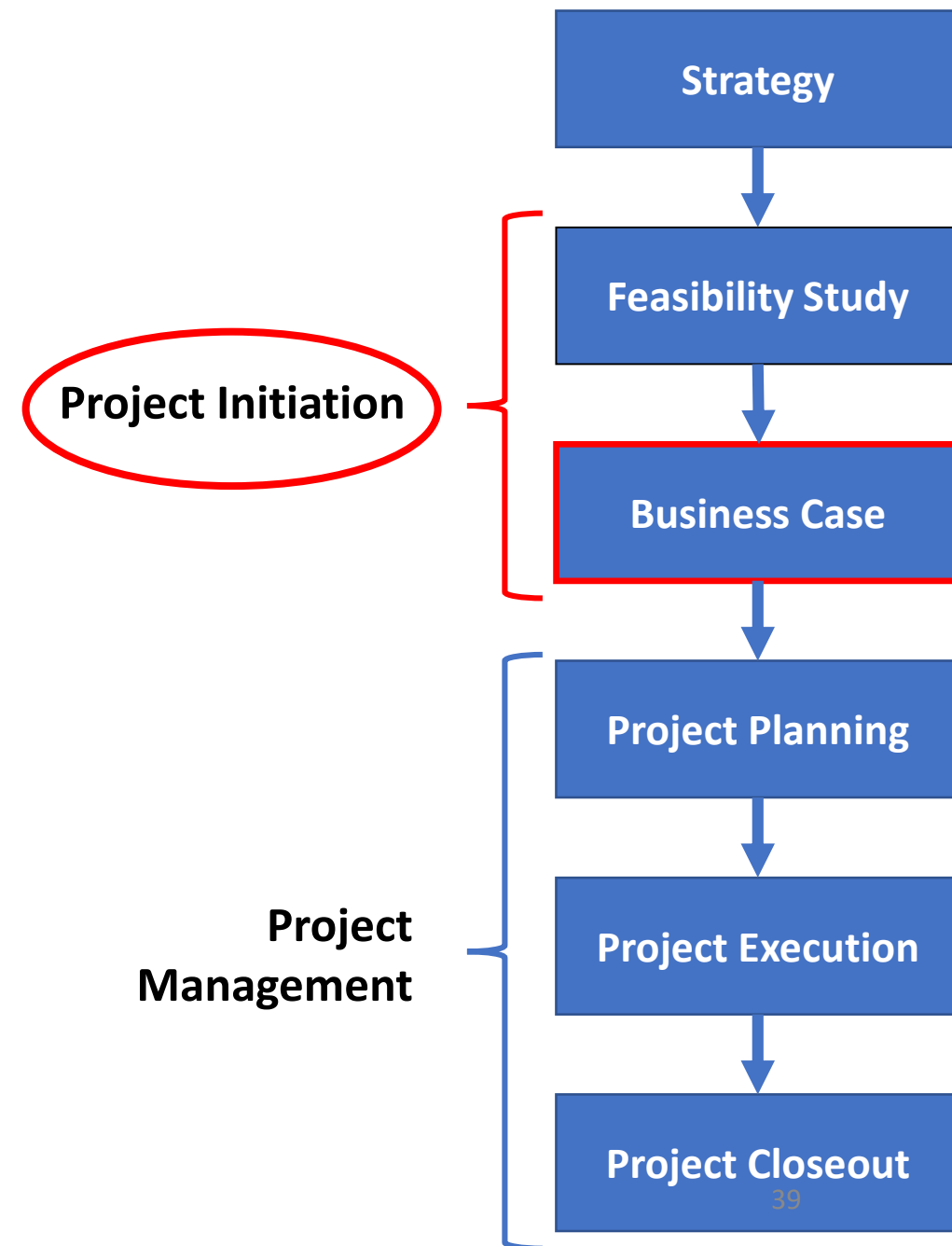
Analysis of alternative options should outline a business case for each solution to enable comparison of costs and benefits

Criteria	Weight	Alternative A		Alternative B		Alternative C	
		Rating	Score	Rating	Score	Rating	Score
Requirements							
Real-time data entry	18	5	90	5	90	5	90
Automatic reorder	18	1	18	5	90	5	90
Real-time data query	14	1	14	5	70	5	70
	50		122		250		250
Constraints							
Developer costs	15	4	60	5	75	3	45
Hardware costs	15	4	60	4	60	3	45
Operating costs	15	5	75	1	15	5	75
Ease of training	5	5	25	3	15	3	15
	50		220		165		180
Total	100		342		415		430

IS Project Business Case Development and Approval

*The **Feasibility Study** assesses if a solution for the new information system is practical and can meet requirements within an established budget and schedule*

*The **Business Case** is based on the feasibility study and provides the information required for an organization to decide to select a project to fund, provide resources to, and allow to proceed*



Business Case

Should be of sufficient detail to answer:

- *Why should this project be undertaken?*
- *Why should this project continue?*

Well-planned projects have decision points (“stage gates” or “kill-points”) at which the business case is formally reviewed to ensure the project is still valid

- Increased costs or reduction in anticipated benefits can invalidate the business case
- IT Auditors are responsible for detecting when changes in project value require reconsidering the validity of the Business Case and continuing the project
- IT Steering Committee needs to consider whether the project should continue

In-Class Activity

Meet in IT Audit Teams

- Assess Smith Consulting's Web Platform (WP) Business Case
- Present findings to class

<https://www.projectmanagementdocs.com/template/project-initiation/business-case/#axzz5dxZ4yoE1>



Project Portfolio Selection Using Multicriteria Decision Analysis

An example...

1. Identify multiple criteria for prioritizing Software R&D projects
 - Cost
 - Division – Supports organizational division goals
 - Market – Important for competing in the market place
 - Technical Excellence – Human capital formation, builds skills, knowledge and increases technical capacity
 - Inter-disciplinary – Builds relationships with other division
 - Benefit – Yields direct benefit to current projects
 - Team – Experience and capabilities of the project team
 - Favorite – Explicit bias of the reviewer

Project portfolio selection based on multi-criteria decision analysis - An example...

1. Identify multiple objectives for prioritizing and selecting projects
2. Rank criteria relative to one another (AHP = Analytical Hierarchy Process)

AHP Weight								
Row Heading more/less/equally important than Column Heading.								
	Cost	Division	Market	TechExcellence	InterDisciplina	Benefit	Team	Favorite
Cost	NA	Strongly Less Important (-5)	Strongly Less Important (-5)	Strongly Less Important (-5)	Strongly Less Important (-5)	Strongly Less Important (-5)	Strongly Less Important (-5)	Demonstrably More Importa
Division	Strongly More Important (5)	NA	Slightly More Important (3)	Slightly Less Important (-3)	Slightly More Important (3)	Equally Important (1)	Slightly Less Important (-3)	Absolutely More Important (9)
Market	Strongly More Important (5)	Slightly Less Important (-3)	NA	Slightly Less Important (-3)	Slightly More Important (3)	Equally Important (1)	Slightly Less Important (-3)	Absolutely More Important (9)
TechExcellence	Strongly More Important (5)	Slightly More Important (3)	Slightly More Important (3)	NA	Strongly More Important (5)	Strongly More Important (5)	Slightly More Important (3)	Absolutely More Important (9)
InterDisciplina	Strongly More Important (5)	Slightly Less Important (-3)	Slightly Less Important (-3)	Strongly Less Important (-5)	NA	Equally Important (1)	Slightly Less Important (-3)	Absolutely More Important (9)
Benefit	Strongly More Important (5)	Equally Important (1)	Equally Important (1)	Strongly Less Important (-5)	Equally Important (1)	NA	Slightly Less Important (-3)	Absolutely More Important (9)
Team	Strongly More Important (5)	Slightly More Important (3)	Slightly More Important (3)	Slightly Less Important (-3)	Slightly More Important (3)	Slightly More Important (3)	NA	Absolutely More Important (9)
Favorite	Demonstrably Less Import	Absolutely Less Important	Absolutely Less Important (-9)	Absolutely Less Important (-9)	Absolutely Less Important (-9)	Absolutely Less Important	Absolutely Less Important (-9)	NA
Weight	03.60	14.15	10.71	31.87	07.73	09.57	20.99	01.39

Multicriteria Decision Analysis, example

1. Identify multiple objectives for prioritizing and selecting projects
2. Rank criteria relative to one another (AHP = Analytical Hierarchy Process)
3. Each committee member ranks the projects on each criterion, scoring and ranking computed

Rank	Name	Score	Cost	Division	Market	TechExcellence	InterDisciplina	Benefit	Team	Favorite
1	Least Cost Path Problem and Solution	0.9721	0.0081	0.1415	0.1071	0.3187	0.0773	0.0957	0.2099	0.0139
2	Alternative Aligment Research Tool	0.8661	0.0080	0.1132	0.1071	0.2549	0.0773	0.0957	0.2099	0.0000
3	Reusable Software Design Patterns	0.7994	0.0091	0.1415	0.0857	0.3187	0.0000	0.0766	0.1679	0.0000
4	Web Mobile GIS Notification System	0.6484	0.0330	0.1132	0.0857	0.1912	0.0000	0.0574	0.1679	0.0000
5	Adv Capital Planning Software Review	0.6350	0.0332	0.0849	0.1071	0.1912	0.0773	0.0574	0.0840	0.0000
6	Requirements Management Systems	0.5237	0.0000	0.0849	0.0643	0.1912	0.0000	0.0574	0.1259	0.0000
7	Cloud Technology Research	0.4972	0.0350	0.0849	0.0857	0.1275	0.0000	0.0383	0.1259	0.0000
8	ArcGIS for Sharepoint	0.4271	0.0360	0.0566	0.0428	0.1275	0.0000	0.0383	0.1259	0.0000
9	HTML5 and Cloud Based Mapping	0.3977	0.0180	0.0849	0.0643	0.1275	0.0000	0.0191	0.0840	0.0000
10	Google Earth Pro Standards	0.3610	0.0310	0.0566	0.0428	0.1275	0.0000	0.0191	0.0840	0.0000

Individual committee member's ranking of R&D project proposals

Multicriteria Decision Analysis, example

1. Identify multiple objectives for prioritizing and selecting projects
2. Rank criteria relative to one another
3. Each committee member ranks the projects on each criterion - scores and ranking computed
4. Overall scoring and ranking of all projects computed, projects selected for portfolio

	A	B	C	D	M	N	O	P	Q
1									
2		Rank	Author	Proposal Title	Cost	Running Total			
3		1	Carolan	Adv Capital Planning Software Review	\$6,400	\$6,400			
4		2	Yarbrough	Alternative Alignment Research Tool	\$9,500	\$15,900			
5		3	Wisdom	Least Cost Path Problem and Solution	\$18,956	\$34,856			
6		4	Kumar	Reusable Software Design Patterns	\$18,434	\$53,290			
7		5	Brennen	Web Mobile GIS Notification System	\$6,500	\$59,790			
8		6	Rutkowski	HTML5 and Cloud Based Mapping	\$14,000	\$73,790			
9		7	Waddell	Requirements Management Systems	\$23,000	\$96,790			
10		8	Killelea	Cloud Technology Research	\$5,500	\$102,290			
11		9	Pescatore	ArcGIS for Sharepoint	\$5,000	\$107,290			
12		10	Pescatore	Google Earth Pro Standards	\$7,500	\$114,790			
13									

Legend	
	Funded
	Not Funded

Ranking		Waddell	Rogers	Lanter	Roman	Brennan	Carolan	Knight	AHP_Weight_Determination
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Agenda

- ✓ Case Study 1 Discussion
- ✓ Today's business IT environment
- ✓ IT Project portfolio
- ✓ Project feasibility study and business case evaluation
- ✓ Multi-criteria decision analysis – project portfolio selection example