Module 2 : Initiating Projects

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ILOC: Project Management (Autonomy)

Agenda : Initiating Projects

- How to get a project started ?
- Selecting projects strategically
- Project selection models
  - Numeric / Scoring Models and
  - Non-numeric models
- Project sponsor and creating charter
- Project Portfolio process
- Project proposal
- Effective project team
- Stages of team development & growth (forming, storming, norming & performing),
- Team dynamics.

Approaches to Project Screening

- Checklist model
- Simplified scoring models
- Analytic hierarchy process
- Profile models
- Financial models

Approaches to Project Screening

Screening system

- Reject proposals that fail to meet minimal requirement (ROI <15%)

Checklist / weighted checklist for rating proposal – According to list of evaluation criteria each proposal reviewed and given score sj. All criteria treated equally important.

- S= ∑Sj, where j = 1,2,...,n

Weighted Rating- Relative importance criteria j is indicated by assigning weight wj . Score is multiplied by weight.

$$S = \Sigma s_j w_j \text{ where } j = 1, 2, \ldots, n$$
$$\Sigma w_j = 1, \text{ and } 0 \leq w_j \leq 1.0$$

- **Evaluation of**

Checklist Model

- A **list of criteria that pertain to choice of projects**, and then applying them to different possible projects.
- **Ex:** In a company, the **key selection criteria are cost and speed to market**
- In deciding among several new product development opportunities, a firm must weigh a variety of issues, including the following:
  - **Cost of development:** What is a reasonable cost estimate?
  - **Potential return on investment:** What kind of return can we expect? What is the likely payback period?

Checklist Model

- **Riskiness of the new venture:** Does the project entail the need to create new-generation technology? How risky is the venture in terms of achieving our anticipated specifications?
- **Stability of the development process:** Are both the parent organization and the project team stable? Can we expect this project to face funding cuts or the loss of key personnel, including senior management sponsors?
- **Governmental or stakeholder interference:** Is the project subject to levels of governmental oversight that could potentially interfere with its development? Might other stakeholders oppose the project and attempt to block completion?

Checklist Model

- **Product durability and future market potential:** Is this project a one-shot opportunity, or could it be the forerunner of future opportunities? A software development firm may, for example, develop an application for a client in hopes that successful performance on this project will lead to future business. On the other hand, they may perceive that the project is simply a one-time opportunity with little potential for future work with the customer.

Checklist Model : Summary

- A checklist is a list of criteria applied to possible projects.
  - ✔ Requires agreement on *criteria*
  - ✔ Assumes all criteria are *equally important*

Checklists are valuable for recording opinions and encouraging discussion

Checklist Model : Example

TABLE 3.2 Simplified Checklist Model for Project Selection

		Performance on Criteria		
Project	**Criteria**	**High**	**Medium**	**Low**
Project Alpha	Cost	X		
	Profit potential			X
	Time to market		X	
	Development risks			X
Project Beta	Cost		X	
	Profit potential		X	
	Time to market	X		
	Development risks		X	
Project Gamma	Cost	X		
	Profit potential	X		
	Time to market			X
	Development risks	X		
Project Delta	Cost			X
	Profit potential			X
	Time to market	X		
	Development risks		X	

Checklist Model : Criteria for Evaluation

Criteria	1	2	3	4
Technical solution approach	Poor	Adequate	Good	Excellent
Price of contract	≥1.8	1.6–1.8	1.4–1.6	≤1.4
Project organization and management	Poor	Adequate	Good	Excellent
Likelihood of meeting cost/schedule targets	Poor	Adequate	Good	Excellent
Reputation of contractor	Poor	Adequate	Good	Excellent

Limitations of Checklist Model

- The flaws in such a model include the **subjective nature** of such ratings as high, medium, or low.
- **Terms are inexact and subject to misinterpretation** or misunderstanding.
- Checklist screening models also **fail to resolve trade-off** issues.

Simplified Scoring Models

- Each project receives a score that is the weighted sum of its grade on a list of criteria. Scoring models require:
  - agreement on *criteria*
  - Each criterion is ranked according to its relative importance
  - agreement on *weights* for criteria
  - a *score* assigned for each criteria

$$Score = \sum (Weight \times Score)$$

- *Relative scores can be misleading!*

Major Steps in Simplified Scoring Models

- Assign importance weights to each criterion:
  - Develop logic for differentiating among various levels of importance and devise a system for assigning appropriate weights to each criterion.
  - Collective group judgment may help to validate the reasons for determining importance levels.
  - The team may also **designate some criteria as "must" items**.
  - Safety concerns, for example, may be stipulated as non negotiable. In other words, all projects must achieve an acceptable safety level or they will not be considered further.

Major Steps in Simplified Scoring Models

- Assign score values to each criterion in terms of its rating (High = 3, Medium = 2, Low = 1):
  - The logic of assigning score values is often an issue of scoring sensitivity—of making differences in scores distinct. Some teams, for example, prefer to widen the range of possible values—say, by using a 1-to-7 scale instead of a 1-to-3 scale in order to ensure a clearer distinction among scores and, therefore, among project choices.
  - Such decisions will vary according to the number of criteria being applied and, perhaps, by team members' experience with the accuracy of outcomes produced by a given approach to screening and selection.

Major Steps in Simplified Scoring Models

- Multiply importance weights by scores to arrive at a weighted score for each criterion: The weighted score reflects both the value that the team gives each criterion and the ratings that the team gives each criterion as an output of the project.
- Add the weighted scores to arrive at an overall project score: The final score for each project becomes the sum of all its weighted criteria.

Example : Simplified Scoring Models

Criterion	Importance Weight
Time to Market	3
Profit Potential	2
Development Risks	2
Cost	1

determine the optimal project to fund

Project	Criteria	(A) Importance Weight	(B) Score	(A) × (B) Weighted Score
Project Alpha				
	Cost	1	3	3
	Profit potential	2	1	2
	Development risk	2	1	2
	Time to market	3	2	6
	Total Score			13
Project Beta				
	Cost	1	2	2
	Profit potential	2	2	4
	Development risk	2	2	4
	Time to market	3	3	9
	Total Score			19

Example : Simplified Scoring Models

Project	Criteria	(A) Importance Weight	(B) Score	(A) × (B) Weighted Score
Project Gamma				
	Cost	1	3	3
	Profit potential	2	3	6
	Development risk	2	3	6
	Time to market	3	1	3
	Total Score			18
Project Delta				
	Cost	1	1	1
	Profit potential	2	1	2
	Development risk	2	2	4
	Time to market	3	3	9
	Total Score			16

Criterion	Importance Weight
Time to Market	3
Profit Potential	2
Development Risks	2
Cost	1

determine the optimal project to fund

Limitations : Simplified Scoring Models

- A **scale from 1 to 3 may be intuitively appealing** and easy to apply and understand, **but it is not very accurate**.
- From the perspective of mathematical scaling, it is simply wrong to treat evaluations on such a scale as real numbers that can be multiplied and summed.
- If 3 means High and 2 means Medium, we know that 3 is better than 2, but we do not know by how much. Furthermore, we cannot assume that the difference between 3 and 2 is the same as the difference between 2 and 1.

Limitations : Simplified Scoring Models

- Another drawback of scoring models is the fact that they **depend on the relevance of the selected criteria and the accuracy of the weight** given them.
- In other words, they do not ensure that there is a reasonable link between the selected and weighted criteria and the business objectives that prompted the project in the first place

Limitations : Simplified Scoring Models

- **Eg.** While selecting projects, the Information Systems steering committee of a large bank adopted three criteria: **contribution to quality, financial performance, and service.** The bank's strategy was focused on customer retention, but the criteria selected by the committee did not reflect this fact.
- As a result, a project aimed at improving service to potential new markets might score high on service even though it would not serve existing customers (the people whose business the bank wants to retain)

The Analytical Hierarchy Process (AHP)

- AHP was developed by Dr. Thomas Saaty to **address many of the technical and managerial problems** frequently associated with decision making through scoring models.
- An **increasingly popular method** for effective project selection, where AHP is a **four-step process**.
  - STRUCTURING THE HIERARCHY OF CRITERIA - constructing a hierarchy of criteria and subcriteria
  - ALLOCATING WEIGHTS TO CRITERIA
  - ASSIGNING NUMERICAL VALUES TO EVALUATION DIMENSIONS
  - EVALUATING PROJECT PROPOSALS

Structuring the Hierarchy of Criteria

- Subdividing relevant criteria into a meaningful hierarchy gives managers a **rational method for sorting** among and ordering priorities
- Because the hierarchy can reflect the structure of organizational strategy and critical success factors, it also provides a way to select and justify projects according to their consistency with business objectives

TABLE 3.4 Hierarchy of Selection Criteria Choices

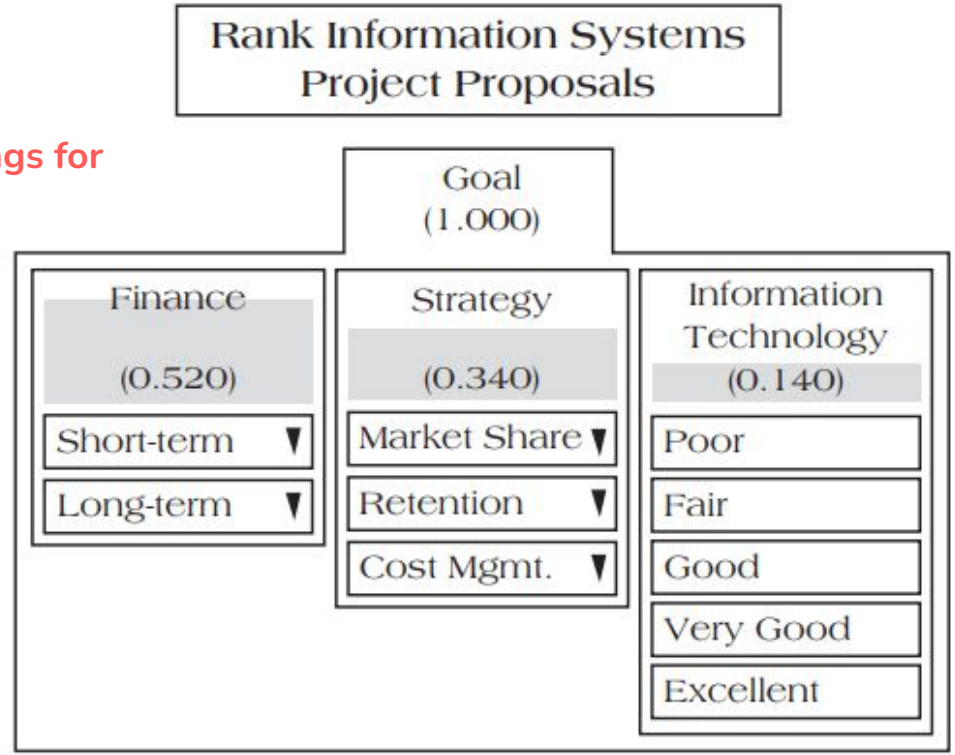
First Level	Second Level
1. Financial Benefits	1A: Short-term
	1B: Long-term
2. Contribution to Strategy	2A: Increasing market share for product X
	2B: Retaining existing customers for product Y
	2C: Improving cost management
3. Contribution to IT Infrastructure	

Allocating Weights to Criteria

- It consists of **allocating weights to previously developed criteria** and, where necessary, **splitting overall criterion weight among subcriteria**.
- Mian and Dai et al. have recommended the so-called **pairwise comparison approach** to weighting, in which every criterion is compared with every other criterion.
- This procedure, **permits more accurate weighing** because it allows managers to focus on a series of relatively simple exchanges— namely, two criteria at a time.

Allocating Weights to Criteria

Sample AHP with Rankings for Salient Selection Criteria



Allocating Weights to Criteria

- Financial benefits received a weighting value of 52%, which was split between Short-term benefits (30%) and Long-term benefits (70%).
- This configuration means that long-term financial benefits receives an **overall weighting of (0.52) × (0.7) = 36.4%**.
- The hierarchical allocation of criteria and splitting of weights **resolves the problem of double counting in scoring models**.
- In these models, criteria such as Service, Quality, and Customer satisfaction may be either separate or overlapping factors, depending on the objectives of the organization

Assigning Numerical values to Evaluation dimensions

- Once the hierarchy is established, Let us use the **pairwise comparison process to assign numerical values** to the dimensions of our evaluation scale.
- It is an **evaluation scale with five dimensions:** Poor, Fair, Good, Very Good, and Excellent.
- Figure 3.2 - shows that for purposes of illustration, we have **assigned the values of 0.0, 0.10, 0.30, 0.60, and 1.00**, respectively, to these dimensions

Assigning Numerical values to Evaluation dimensions

	Nominal	Priority	Bar Graph
Poor	0.00000	0.000	
Fair	0.10000	0.050	
Good	0.30000	0.150	
Very Good	0.60000	0.300	
Excellent	1.00000	0.500	
Total	2.00000	1.000	

FIGURE 3.2 Assigning Numerical Values to Labels

Evaluating Project Proposals

- In final step, **multiply the numeric evaluation of the project by the weights** assigned to the evaluation criteria and **then add up the results** for all criteria.
- The figure (next slide) shows how five potential projects might be evaluated by means of an AHP program offered by Expert Choice, a maker of decision software.
- The key features of the spreadsheet:
  - Second row specifies the value assigned to each of five possible ratings (from Poor = 1 = .000 to Excellent = 5 = 1.000).
  - Fourth row specifies the five decision criteria and their relative weights (Finance/Short-Term = .1560, Strategy/Cost Management = .0816, and so forth).

Evaluating Project Proposals

- (Note that three criteria have been broken down into six subcriteria.)
- The second column lists the five projects (Perfect Project, Aligned, etc.).
- The column labeled **"Total" gives a value for each alternative**. This number is found by multiplying each evaluation by the appropriate criterion weight and summing the results across all criteria evaluations

Evaluating Project Proposals

Finance	Short-term			
Poor 1 (.000)	Fair 2 (.100)	Good 3 (.300)	Very Good 4 (.600)	Excellent 5 (1.000)

	Alternatives	Total	Finance		Strategy			Technology
			Short-Term	Long-Term	Market Share	Retention	Cost Management	
			.1560	.3640	.1020	.1564	.0816	.1400
1	Perfect Project	1.000	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
2	Aligned	0.762	Good	Excellent	Good	Excellent	Good	Excellent
3	Not Aligned	0.538	Excellent	Good	Excellent	Good	Excellent	Good
4	All Very Good	0.600	Very Good	Very Good	Very Good	Very Good	Very Good	Very Good
5	Mixed	0.284	Poor	Fair	Good	Very Good	Excellent	Good
6								
7								
8								
9								
10								

FIGURE 3.3 The Project Rating Spreadsheet

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Evaluating Project Proposals

To illustrate how the calculations are derived, let us take the Aligned project as an example. Remember that each rating (excellent, very good, good, etc.) carries with it a numerical score. These scores, when multiplied by the evaluation criteria, yield: The Perfect Project, for example, was rated Excellent on all six dimensions and thus received a score of 1.000. Note, too, the evaluations of the Aligned and Not Aligned project choices. Although both projects received an equal number of Excellent and Good rankings, the Aligned project was clearly preferable because it was rated higher on criteria viewed as more important and thus more heavily weighted.

Simple Rating

Criteria	Scores		
	Iron Butterfly	Lowball	Modicum
Technical solution approach	3	1	4
Price of contract	4	4	1
Project organization/management	4	2	3
Likelihood of meeting cost/schedule targets	3	2	4
Reputation of contractor	3	3	4
Sum	17	12	16

Based on the sum of simple ratings, Iron Butterfly was rated the best.

Weighted Rating

Criteria	Weight
Technical solution approach	0.25
Price of contract	0.25
Project organization and management	0.20
Likelihood of meeting cost/schedule targets	0.15
Reputation of contractor	0.15
	1.00

Taking the weights into account, the proposals scored as follows:

		Iron Butterfly		Modicum	
Criterion	Weight (w)	S	$(s)(w)$	s	$(s)(w)$
Technical solution approach	0.25	3	0.75	4	1.0
Price of contract	0.25	4	1.0	1	0.25
Project organization/management	0.20	4	0.8	3	0.6
Risks of solution	0.15	3	0.45	4	0.6
Reputation of contractor	0.15	3	0.45	4	0.6
Sum			3.45		3.05

Using the sum of the weighted ratings, Iron Butterfly Contractors stands out as having the superior proposal.

Weighted Rating

Criterion	Weight (w)	Iron Butterfly s	Iron Butterfly (s)(w)	Lowball s	Lowball (s)(w)	Modicum s	Modicum (s)(w)
Technical solution approach	0.25	4	1.0	2	0.5	5	1.25
Price of contract	0.25	5	1.25	5	1.25	2	0.5
Project organization/ management	0.20	5	1.0	3	0.6	4	0.8
Risks of solution	0.15	4	0.6	3	0.45	5	0.75
Reputation of contractor	0.15	4	0.6	4	0.6	5	0.75
	Sum		4.45		3.4		4.05

Using the sum of the weighted ratings, Iron Butterfly Contractors stands out as having the superior proposal.

Weighted Rating

Table 17-1 Project Weighted Scoring Model.

Criteria		Very Good 4	Good 3	Fair 2	Poor 1	Very Poor 0	Expected Rating	Weighted	Weight Expected Score
Long-range outlook	1. Product	0.8	0.2				3.8	10	38
	2. Market	1.0					4.0	10	40
Meets objectives	1. ECV	0.8	0.2				3.8	5	19
	2. ROI		1.0				3.0	6	18.0
	3. Image		0.6	0.4			2.6	4	10.4
Fits strategy	Phase 1	0.8	0.2				3.8	10	38
	Phase 2	1.0					1.0	5	5
	Phase 3	0.6	0.2	0.2			3.4	5	17
Goal contribution	Goal A	0.2	0.8				3.2	10	32
	Goal B	1.0					4.0	5	20
	Goal C		0.2	0.2	0.6		1.6	4	6.4
Risk level acceptability		0.7	0.3				3.7	10	37
Competitive advantage		0.9	0.1				3.9	8	31.2
Compatibility with other systems		0.2	0.7	0.1			3.1	8	24.8
	Total							100	336.8/400

Adapted from David Cleland in *Project Management: Strategic Design and Implementation*, 3rd ed., (McGraw-Hill, 1999); reprinted in *Project Portfolio Management*, L. Dye and J. Pennypacker, eds. (West Chester, PA: Center for Business Practices, 1999): 3–22.

Exercise

14. Three proposals (W, X, and Y) have been rated on six criteria as follows: 1 = poor, 2 = average, 3 = good. Choose between the three proposals using (a) the simple rating method and (b) the weighted rating method.

Criteria	Weight	W	X	Y
Attention to quality	0.25	2	1	3
Cost	0.20	3	3	1
Project plan	0.20	2	2	1
Project organization	0.15	3	2	3
Likelihood of success	0.10	2	3	3
Contractor's credentials	0.10	2	2	3

Profile Models

- Profile models **allow managers to plot risk/return options** for various alternatives and then **select the project that maximizes return** while staying within a certain range of minimum acceptable risk.
- "Risk," is a subjective assessment: it may be difficult to reach overall agreement on the level of risk associated with a given project.
- The profile model offers **another way of evaluating, screening, and comparing projects**
- For simplicity's sake, they chose to **focus on** the two criteria of **risk and reward.**

Profile Models

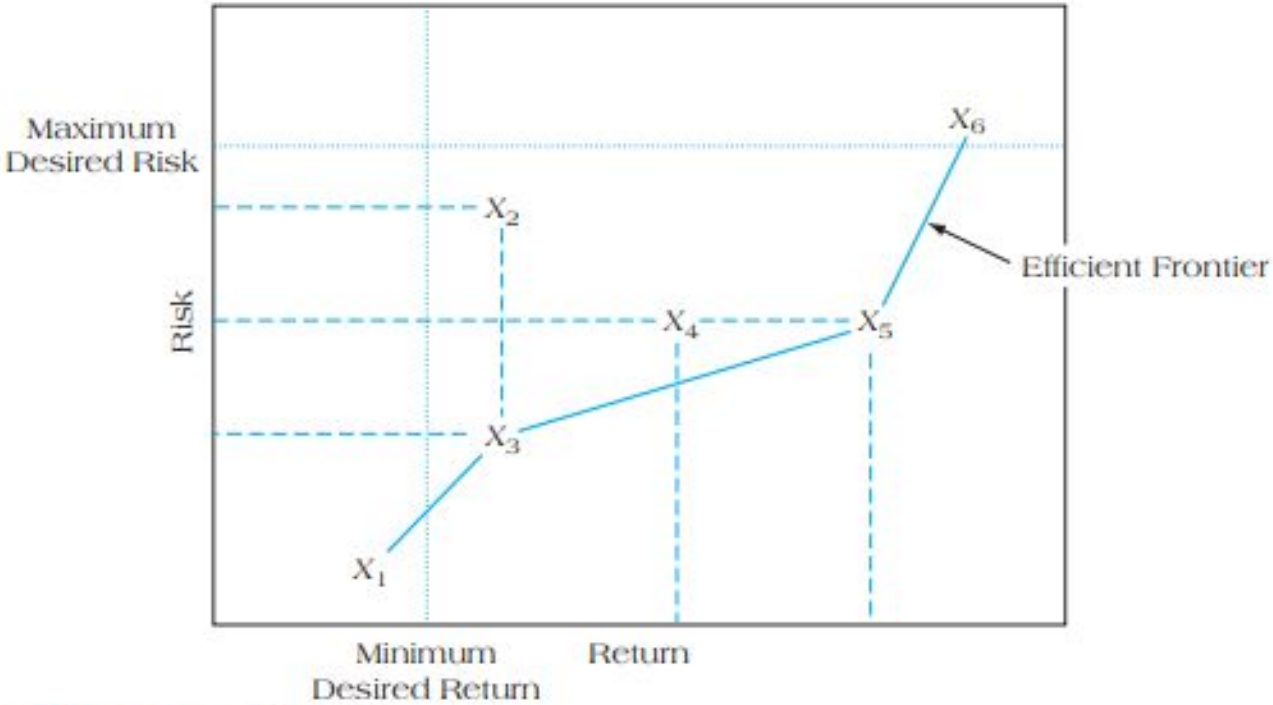

FIGURE 3.4 **Profile Model**

Profile Models - Limitations

- They limit decision criteria — risk and return.
- Though safety, quality, and reliability, can come under the heading of “risk,” the approach still necessarily limits the decision maker to a small set of criteria
- In order to be evaluated in terms of an efficient frontier, some value must be attached to risk.
- Expected return is a measure that is naturally given to numerical estimate. But because risk may not be readily quantified, it may be misleading to designate “risk” artificially as a value for comparison among project choices.

Financial Models

- Three popular financial models: **discounted cash flow analysis, net present value, and internal rate of return**
- Financial models are all predicated on the **time value of money principle**. The time value of money suggests that money earned today is worth more than money we expect to earn in the future.
- There are two reasons why we would expect future money to be worth less: (1) **the impact of inflation, and (2) the inability to invest the money**. Inflation, causes prices to rise and hence erodes consumers' spending power.
- if Project A will earn $50,000 in two years and Project B will earn our company $50,000 in four years, Project A is the best choice because we will receive the money sooner.

Financial Models - Payback Period

- Refers to the period of time required for the return on an investment to "repay" the sum of the original investment
- Eg.: $1000 investment which returned $500 per year would have a two year payback period. The time value of money is not taken into account.
- Payback period intuitively measures how long something takes to **"pay for itself."** Shorter payback periods are preferable to longer payback periods.
- Payback period as a tool of analysis is often used because it is easy to apply and easy to understand for most individuals.

Financial Models - Payback Period

- The most basic method of financial evaluation is simply to **compare** the income that will be generated with the initial investment.
- **Identify the time needed** (rough estimate of time) for costs to be recovered
  - simple
  - doesn't consider negative cash flow in early period.
- The most common reasons for company failure in US is **lack of cash flow.**

Financial Models - Payback Period

- Determines ***how long*** it takes for a project to reach a breakeven point

$$Payback\ Period = \frac{Investment}{Annual\ Cash\ Savings}$$

Cash flows should be discounted

Lower numbers are better ***(faster payback)***

Payback Period - Example

- A project requires an initial investment of $200,000 and will generate cash savings of $75,000 each year for the next five years. What is the payback period?

Year	Cash Flow	Cumulative
0	($200,000)	($200,000)
1	$75,000	($125,000)
2	$75,000	($50,000)
3	$75,000	$25,000

Divide the cumulative amount by the cash flow amount in the third year and subtract from 3 to find out the moment the project breaks even.

$$3 - \frac{25,000}{75,000} = 2.67 \text{ years}$$

$$3 - \frac{25,000}{75,000} = 2.67 \text{ years}$$

Payback Period : Exercise

- The goal of the **discounted cash flow (DCF) method** is to estimate cash outlays and expected cash inflows resulting from investment in a project.

TABLE 3.5 Initial Outlay and Projected Revenues for Two Project Options

	Project A		Project B	
	Revenues	Outlays	Revenues	Outlays
Year 0		$500,000		$500,000
Year 1	$ 50,000		$ 75,000	
Year 2	150,000		100,000	
Year 3	350,000		150,000	
Year 4	600,000		150,000	
Year 5	500,000		900,000	

Average Rate of Return

- The **ratio of the average annual profit (either after or before taxes) to the average or initial investment** in the project is referred to as the average rate of return.
- **Average Rate of Return = $30,000 / $200,000 = 0.15**
- Two models have major advantage in the shape of simplicity, but **none of them cover the important concept of time value of money.**

Net Present Value (NPV) / Discounted Cash Flow

- Most **popular financial decision-making approach** in project selection. A positive NPV indicates that the firm will make money—and its value will rise
- NPV compares the **value** of a dollar today to the **value** of that same dollar in the future, **taking inflation and returns into account.**
- The basic calculation is applied to the benefit, which must then be offset against the cost. This figure is called the Net Present Value (NPV) which **equals to present value of benefit – present value of cost.**

Net Present Value (NPV) / Discounted Cash Flow

- Projects the change in the firm's stock value if a project is undertaken.

$$NPV = I_o + \sum \frac{F_t}{(1 + r + p_t)^t}$$

Higher NPV values are better!

where

F_t = *net cash flow for period t*

R = *required rate of return*

I = *initial cash investment*

P_t = *inflation rate during period t*

Net Present Value (NPV) : Example

- Should you invest $60,000 in a project that will return $15,000 per year for five years? You have a minimum return of 8% and expect inflation to hold steady at 3% over the next five years.

Year	Net flow	Discount	NPV
0	-$60,000	1.0000	-$60,000.00
1	$15,000	0.9009	$13,513.51
2	$15,000	0.8116	$12,174.34
3	$15,000	0.7312	$10,967.87
4	$15,000	0.6587	$9,880.96
5	$15,000	0.5935	$8,901.77
			-$4,561.54

Discount factor: simply the reciprocal of the discount rate (1/(1 + k + p) t) where k=8%, p=3%

The NPV column total is negative, so don't invest!

Internal Rate of Return

- A project must meet a **minimum rate of return** before it is worthy of consideration.

$$IO = \sum_{n=1}^{t} \frac{ACF_t}{(1+IRR)t}$$

$where$

$ACF_t = annual\ after\ tax\ cash\ flow\ for\ time\ period\ t$

$IO = initial\ cash\ outlay$

$n = project's\ expected\ life$

$IRR = the\ project's\ internal\ rate\ of\ return$

Internal Rate of Return (IRR) : Example

- A project that costs $40,000 will generate cash flows of $14,000 for the next four years. You have a rate of return requirement of 17%; does this project meet the threshold?

Year	Net flow	Discount	NPV
0	-$40,000	1.0000	-$40,000.00
1	$14,000	0.9009	$12,173.91
2	$14,000	0.8116	$10,586.01
3	$14,000	0.7312	$9,205.23
4	$14,000	0.6587	$8,004.55
			-$30.30

This table has been calculated using a discount rate of 15%

The project doesn't meet our 17% requirement and should not be considered further.

Project Team

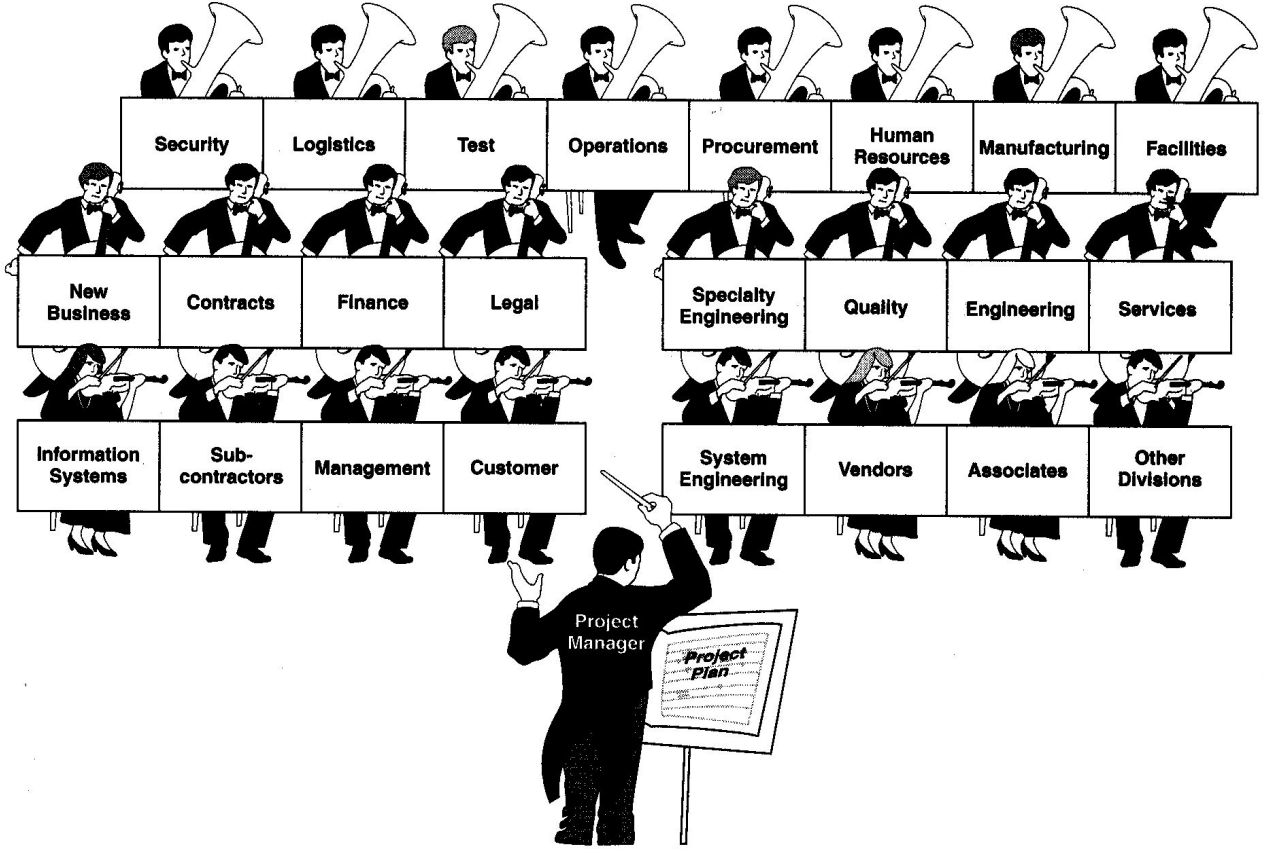

FIGURE 3.1 Our image of a great project team is an orchestra, each member capable of solo performances, but committed to teamwork.

What is a team?

- A team is a small number of people with complementary skills who are committed to a common purpose, performance goals, and approach for which they hold themselves mutually accountable

- Small Number
- Complementary Skills
- Common Purpose & Performance Goals
- Common Approach
- Mutual Accountability

Project Resource Management

Team building and team development

Who knows the Difference?

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Team Building & Development

Team building

- retroactive
- focuses on solving problems relating to team members in the short term
- short duration

Team development

- proactive
- focuses on the ongoing achievement of targets (positive motivation)
- for the duration of the project

Team building is part of team development

Team Members

- Team members -- typically three to four per team--are the rest of the people involved in the project.
- Team members are appointed by the Team leader or the Stakeholders.
- The nature of the project dictates who they are.

Team Composition and Roles

- Right people should be assigned to the team.
- Each person should be selected based on his or her knowledge and expertise.
- In addition to selecting the appropriate people, there are also key roles that are essential to the overall team's success:
    - Meeting leader
    - Facilitator
    - Team member
    - Recorder
    - Timekeeper
    - Encourager/gatekeeper
    - Devil’s advocate.

Other Important Roles

- **Recorder**

  The recorder is the team member who is responsible for making sure that the process(es) being used by the group is **documented**. This includes writing down all the important points of a discussion and preparing the minutes of a meeting.

- **Time Keeper**

  The time keeper has the responsibility of keeping the team moving so that they finish the task at hand.

Other Important Roles

- Encourager/ Gatekeeper

  The task of giving encouragement to all the other team members.
  - The responsibility of maintaining a balanced level of participation for all the members.
  - Ensures all members ideas and thoughts are heard
- Devil's Advocate

  The devil's advocate takes a position opposite to that held by the team to ensure that all sides of an issue are considered.

Stages of team development

- Theory on team development predicts that teams, like individuals, pass through predictable, sequential stages over time. The most well known of these models is that of Tuckman (1965), who labeled the stages of team development as forming, storming, norming, performing, and adjourning.

Stages of team development

- Like in a personal relationship, teams have to grow through different stages of development before they become effective
- The following stages have been identified:
  - **forming**: of a team identity
  - **storming**: where individual evaluate their initial expectations; possible dissatisfaction
  - **norming**: rules and standards are set
  - **performing**: high commitment and job satisfaction. Team functions effectively.
  - **adjourning**: closure/disbandment of team. Possibly insecurity about the future.

Forming

- Takes place in the first stages of team building
- Team meets and learns about the opportunity & challenges, agrees on goals and begins to tackle the tasks
- Team members tend to behave quite independently
- They may be motivated but are usually relatively uninformed of the issues and objectives of the team
- Team members are usually on their best behavior but very focused on self
- Mature team members begin to model appropriate behaviour
- Supervisors of the team during this phase tend to need to be directive.

Storming

- Different ideas compete for consideration
- Team addresses issues such as what problems they are really supposed to solve, how they will function independently and together and what leadership model they will accept
- Team members open up/confront each other's ideas and perspectives.
- In some cases storming can be resolved quickly. In others, the team never leaves this stage.
- The maturity of some team members usually determines whether the team will ever move out of this stage. Immature team members will begin acting up to demonstrate how much they know and convince others that their ideas are correct
- Some team members will focus on minutiae to evade real issues

Storming

- Storming is necessary to the growth of the team
- It can be contentious, unpleasant and even painful to members of the team who are averse to conflict
- Tolerance of each team member and their differences needs to be emphasized. Without tolerance and patience the team will fail
- This phase can become destructive to the team and will lower motivation if allowed to get out of control.
- Supervisors of the team during this phase may be more accessible but tend to still need to be directive in their guidance of decision-making and professional behaviour.

Norming

- Team members adjust behaviour to each other as they develop work habits that make teamwork more fluid
- Team members agree on rules, values, professional behavior, shared methods, working tools and even taboos and begin to trust each other. Motivation increases.
- Teams in this phase may lose their creativity if the norming behaviours become too strong and begin to stifle healthy dissent and the team begins to exhibit **groupthink**
- Supervisors of the team during this phase tend to be participative more than in the earlier stages. Team members take more responsibility for making decisions and for their professional behaviour.

Performing

- Team members have become interdependent
- They are now motivated and knowledgeable.
- The team members are now competent, autonomous and able to handle the decision-making process without supervision.
- Supervisors of the team during this phase are almost always participative.
- The team will make most of the necessary decisions.
- Even the most high-performing teams will revert to earlier stages in certain circumstances. Many long-standing teams will go through these cycles many times as they react to changing circumstances.
- For example, a change in leadership may cause the team to revert to *storming* as the new people challenge the existing norms and dynamics of the team.

Adjourning

- Tuckman later added a fifth phase, *adjourning*
- Involves completing the task and breaking up the team

Stages of Team Development

Stages	Major Processes	Characteristics
Forming (orientation)	• Exchange of information; increased inter-dependency; task exploration; identification of commonalities	Tentative interactions; polite discourse; concern over ambiguity;self-discourse
Storming (conflict)	• Disagreement over procedures; expression of dissatisfaction; emotional responses; resistance	• Criticism of ideas; poor attendance; hostility; polarization and coalition forming
Norming (cohesion)	• Growth of cohesiveness and unity; establishment of roles, standards, and relationships	• Agreement on procedures; reduction in role ambiguity; increased "we-feeling"

Stages of Team Development

Stages	Major Processes	Characteristics
Performing (performance)	• Goal achievement; high task orientation; emphasis on performance and production	• Decision making; problem solving; mutual cooperation
Adjourning (dissolution)	• Termination of roles; completion of tasks; reduction of dependency	• Disintegration and withdrawal; increased independence and emotionality; regret

Barriers to Team Development

The main barriers have been identified to be:

- differing outlooks, priorities and interests
- role conflicts
- unclear project outcomes and objectives
- dynamic project environments
- competition over team leadership
- lack of team definition and structure
- team personnel selection
- credibility of project leader
- lack of team member commitment
- communication problems
- lack of top management support

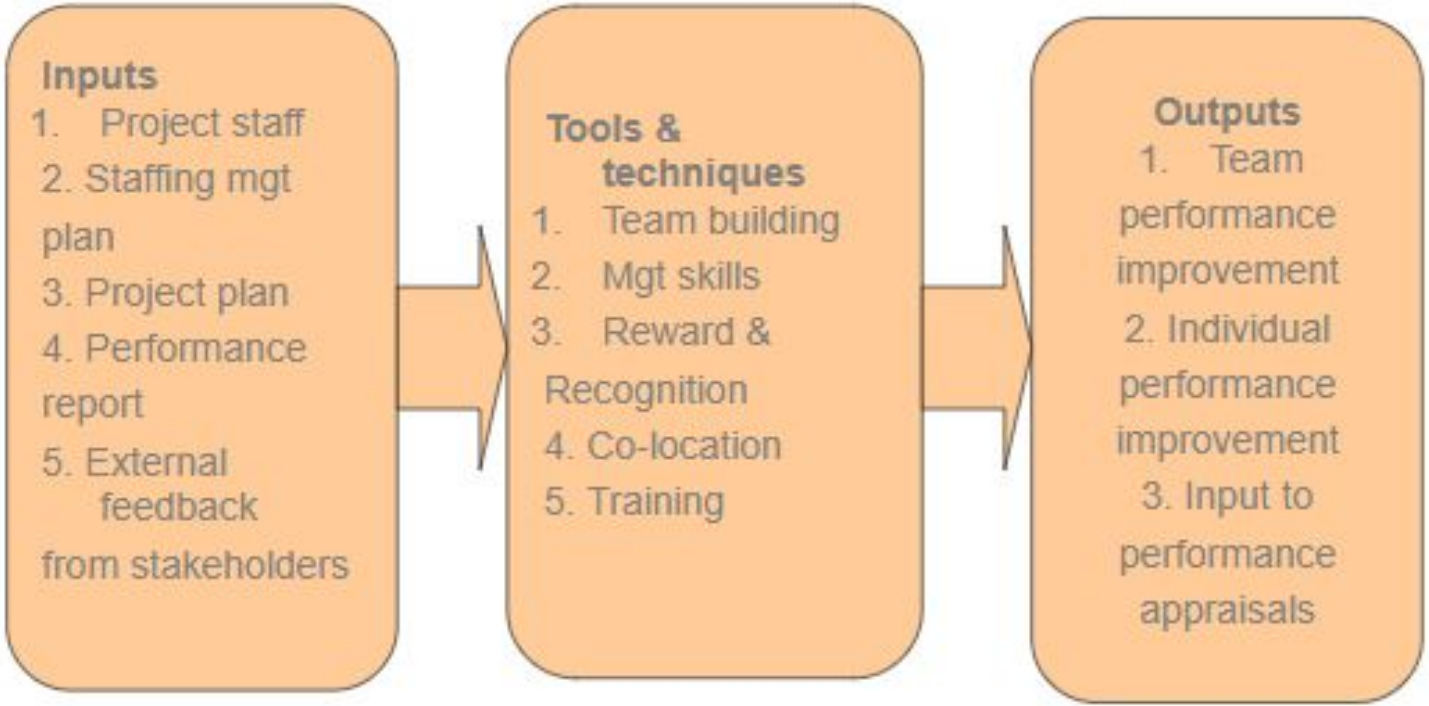
Team Effectiveness

- Project success requires an effective project team, which can be identified by having the following characteristics:
  - a clear understanding of project objectives
  - clear expectations of each team member's role and responsibilities
  - a result orientation
  - a high degree of co-operation and collaboration
  - a high level of trust

Team Size

- It is **difficult to suggest the correct size** that a project team should be
- Big teams obviously have all the disadvantages of big organisation like long channels of communication and authority, lack of control
- The size of the team depends on the complexity and number of deliverables of the project

Team Development



Team Effectiveness Review(TER)

- Periodic team effectiveness review meetings can improve team effectiveness and productivity
- During these meetings team members effectiveness, progress in general, problem areas solving, planning of project phases and identification of priorities and the team's general functioning are discussed.
- The aim of TER is to improve the effectiveness of the project team and to work at reducing those aspects, which if left unattended, could cause team productivity and performance to decrease.