Project Selection

Types of Companies

- Companies considering projects fall into two broad categories:
  - Companies whose core business is completing projects
  - Companies whose core business is something else
- They can also be broken down as:
  - Companies looking at projects to do for others
  - Companies looking at projects to do for themselves

Overview of PS Process

- **Project Management Office (PMO):** Aligning corporate needs and project goals
- **Project selection:** Choose candidate projects using evaluation criteria
- **Dealing with uncertainty:** Risk analysis
- **Strategically selecting best projects:** Project Portfolio Process (PPP)
- **Locking up the deal:** Writing a project proposal

Criteria for Project Selection Models

- **Realism** (technical-, resource-, market-risk)
- **Capability** (adequately sophisticated)
- **Flexibility** (valid results over large domain)
- **Ease of Use** (no expert needed to run model)
- **Cost** (much less than project benefit)
- **Easy Computerization** (use standard software)

The Nature of Project Selection Models

- Models turn inputs into outputs
- Managers decide on the values for the inputs and evaluate the outputs
- The inputs never fully describe the situation
- The outputs never fully describe the expected results
- Models are tools
- Managers are the decision makers

Nature of PS models: *Caveats*

- Project decisions are made by PM --- NOT by PS model!
- A PS model APPROXIMATES, but does NOT DUPLICATE reality!

PS Models:
Methodology

- **Start** with detailed list of firm's goals
- **Create** list of project evaluation factors (PEF's)
- **Weigh** every element in PEF list
- **Compute** an overall score for project based on weighted PEF's
- **Select** project that has the closest alignment with firm's goals

Project Evaluation Factors (PEFs)

- Production Factors
- Marketing Factors
- Financial Factors
- Personnel Factors
- Administrative and Misc. Factors

Production factors

- Installation time
- Learning curve
- Effects of waste and rejects
- Safety
- Other applications etc
- Effects of
  - Changes in cost of inputs
  - Availability of input etc.

Marketing factors

- Size of potential market
- Probable mkt share
- Time until mkt share is acquired
- Impact on current product line
- Life cycle of output etc.

Financial Factors

- Profitability , NPV of the investment
- Impact of cash flows
- Payout period
- Cash requirements
- Time until breakeven
- Size of investment required
- Impact on seasonal and cyclical fluctuations.

Admn. And Misc.

- Safety stds.
- Environmental stds.
- Reaction of stockholders
- Patent and trade secret
- Image in mkt
- Managerial capacity to direct and control new process.

Types of PS Models:
Nonnumeric

- Sacred Cow
- Operating Necessity
- Competitive Necessity
- Product Line Extension
- Comparative Benefit Model

Numeric PS Models: Profit / Profitability

- Payback Period (PB)
- Average Rate of Return
- Discounted Cash Flow (NPV)
- Internal Rate of Return
- Profitability Index
- Other Profitability Models

Numeric PS Models: Profit / Profitability

- Payback Period (PB)(recovery of initial fixed investment)
- Average Rate of Return (ratio of avg annual profit to the initial investment)
- Discounted Cash Flow (NPV) NPV of all cashflows after discounting them by required rate of return
- Internal Rate of Return
- Profitability Index – NPV of all cashflows divided by initial cash investment
- Other Profitability Models

Numeric PS Models: Scoring

- Unweighted 0-1 Factor Model
- Unweighted Factor Scoring Model
- Weighted Factor Scoring Model
- Constrained Weighted Factor Scoring Model

- $S = \sum(x)$
- $S = \sum(s)$
- $S = \sum(s \cdot w)$
- $S = \sum(s \cdot w) \prod(c)$

Unweighted 0-1 Factor Model

criteria		proj1	proj2
a		y	n
b		n	n
c		y	y
d		y	y
e		y	y
ttl		4	3

Unweighted Factor Scoring Model

criteria	scale	proj1	proj2
a	1 - 5	1	2
b	1 - 5	2	3
c	1 - 5	5	4
d	1 - 5	5	4
e	1 - 5	1	4
ttl		14	17

Weighted Factor Scoring Model

criteria	weight	proj1	proj2
a	2	1	2
b	1	2	3
c	5	5	4
d	4	5	4
e	3	1	4
ttl		52	53

Choosing the PS Model

- Dependent on wishes and philosophy of management
- 80% of Fortune 500 firms choose "nonnumeric" PS models
- Firms with outside funding often choose scoring PS models
- Firms without outside funding often choose profit / profitability PS models

Risk Considerations in Project Selection

- Both costs and benefits are uncertain
  - Benefits are more uncertain
- There are many ways of dealing with risk
- Can make estimates about the probability of outcomes
  - Subjective probabilities
- Uncertainty about:
  - Timing
  - What will be accomplished?
  - Side effects
- Pro forma documents

The Project Portfolio Process (PPP)

- Links projects directly to the goals and strategy of the organization
- Means for monitoring and controlling projects

Symptoms of a Misaligned Portfolio

- More projects
- Inconsistent determination of benefits
- Projects that don't contribute to the strategy
- Competing projects
- Costs exceed benefits
- No risk analysis of projects
- Lack of tracking against the plan
- No client for project

Purpose of Project Portfolio Process

- Identify nonprojects
- Prioritize list of projects
- Limit number of projects
- Identify the real options for each project
- Identify projects with good fit
- Identify co-dependent projects