Software Project Management

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Project Evaluation

- A high level assessment of the project
  - to see whether it is worthwhile to proceed with the project
  - to see whether the project will fit in the strategic planning of the whole organization.

Project Evaluation - Why

- Want to decide whether a project can proceed before it is too late
- Want to decide which of the several alternative projects has a better success rate, a higher turnover etc.
- Is it desirable to carry out the development and operation of the software system?

Project Evaluation - Who

- Senior management
- Project manager/coordinator
- Team leader

Project Evaluation - When

- Usually at the beginning of the project
  - e.g. Step 0 of Step Wise Framework

Project Evaluation - What

- Strategic assessment
- Technical assessment
- Economic assessment

Strategic Assessment (SA)

- Used to assess whether a project fits in the *long-term goal* of the organization
- Usually carried out by senior management
- Needs a strategic plan that clearly defines the objectives of the organization
- Evaluates individual projects against the strategic plan or the overall business objectives.

Strategic Assessment

- Programme management
  - A program is a collection of projects that all contribute to same overall organizational goals.
  - Program management is the process of managing multiple on going projects.
  - An example would be that of designing, manufacturing and providing support infrastructure for an automobile make.
- Portfolio management
  - suitable for project developed for other companies by software houses

SA – Programme Management

- Individual projects as components of a programme within the organization

  Programme as "a group of projects that are managed in a coordinated way to gain benefits that would not be possible were the projects to be managed independently"

  by D.C. Ferns

  Journal of Project Management

  Aug. 1991

Programs may be

- Strategic
- Business cycle programmes
- Infrastructure programmes
- Research and development programmes
- Innovative partnerships

Programs

- Strategic
  - Several projects together implement a single strategy.
  - For example, merging two organizations will involve many different activities e.g. physical re-organization of offices, redesigning the corporate image, merging ICT systems etc.
  - Each of these activities could be project within an overarching programme.
- Business cycle programmes
  - A portfolio of project that are to take place within a certain time frame e.g. the next financial year
- Infrastructure programmes
  - In an organization there may be many different ICT-based applications which share the same hardware/software infrastructure

Programs

- Research and development programmes
  - In a very innovative environment where new products are being developed, a range of products could be developed some of which are very speculative and high-risk but potentially very profitable and some will have a lower risk but will return a lower profit.
  - Getting the right balance would be key to the organization's long term success
- Innovative partnerships
  - e.g. pre-competitive co-operation to develop new technologies that could be exploited by a whole range of companies

SA – Programme Management Issues

- Objectives
- How does the project contribute to the *long-term goal* of the organization?
- Will the product increase the market share? By how much?
- IS plan
  - Does the product fit into the overall IS plan?
  - How does the product relate to other existing systems?

SA – Programme Management Issues

- Organization structure
  - How does the product affect the existing organizational structure? the existing workflow? the overall business model?
- MIS (Management Information System)
  - What information does the product provide?
  - To whom is the information provided?
  - How does the product relate to other existing MISs?

SA – Programme Management Issues

- Personnel
  - What are the staff implications?
  - What are the impacts on the overall policy on staff development?
- Image
  - How does the product affect the image of the organization?

Program managers versus project managers

Programme manager

- Many simultaneous projects
- Personal relationship with skilled resources
- Optimization of resource use
- Projects tend to be seen as similar

Project manager

- One project at a time
- Impersonal relationship with resources
- Minimization of demand for resources
- Projects tend to be seen as unique

Technical Assessment

- Functionality against hardware and software
- The strategic IS plan of the organization
- any constraints imposed by the IS plan

Economic Assessment

Why?

- Consider whether the project is the best among other options
- Prioritise the projects so that the resources can be allocated effectively if several projects are underway.

Economic Assessment

How?

- Cost-benefit analysis
- Cash flow forecasting
- Various cost-benefit evaluation techniques
    - NPV and IRR

Benefits management

To carry this out, you must:

- Define expected benefits
- Analyse balance between costs and benefits
- Plan how benefits will be achieved
- Allocate responsibilities for their achievement
- Monitor achievement of benefits

Benefits

- Benefit are the monetary values of desirable consequence of economic polices and decisions.
- These might include:
- Mandatory requirement
- Improved quality of service
- Increased productivity
- More motivated workforce
- Internal management benefits
- Risk reduction
- Economies
- Revenue enhancement/acceleration
- Strategic fit

Quantifying benefits

Benefits can be:

- Quantified and valued e.g. a reduction of *x* staff saving *£y*
- Quantified but not valued e.g. a decrease in customer complaints by *x%*
- Identified but not easily quantified – e.g. public approval for a organization in the locality where it is based

Costs

- Cost is the value of money that has been used up to produce something, and hence is not available for use anymore.
- Development Costs:
  - Includes the salaries and other employment costs of the staff involved in the development project and all associated costs.
- Setup Costs:
  - Include the costs of putting the system into place.
  - These consist mainly of the costs of any new hardware and equipment but will also include costs of file conversion, recruitment and staff training.
- Operational Costs:
  - Consists of the costs of operating the system once it has been installed.

Cost Benefit Analysis (CBA)

- Cost Benefit Analysis (CBA) is an economic evaluation technique that measures all the positive (beneficial) and negative (costly) consequences of an intervention or program in monetary terms
- The valuation of all program outcomes in monetary units allows decision makers to directly compare the outcomes of different types of interventions.
- Two steps of CBA:
  - Identify and estimate all the costs and benefits of carrying out the project
  - Express the costs and benefits in a common unit for easy comparison (e.g. $)

Principles of Cost Benefit Analysis

- There must be a common unit of measurement
- CBA valuations should represents Producers or Consumers
- Benefits are usually measured by Market Choices
- Gross benefits of an increase in consumption is an area under the demand curve
- CBA involves a particular study area
- Double counting of benefits or cost must be avoided
- Decision criteria of projects

Case Study

- New Computer Equipment:

Item	Quantity	Cost
Network Ready PC's supporting software	10	2450 $ each
Server	1	3500 $
Printers	3	1200 $ each
Cabling & Installation	1	4600 $
Sales Support Software	1	15000 $

Case Study

Training Cost

Item	Quantity	Cost
Computer Introduction	8	$ 400 each
Key board skills	8	$ 400 each
Sales support skills	12	$ 700 each

Other cost

Item	Quantity	Cost
Lost time	40 man days	$ 200 PER DAY
Lost sales through disruption		$ 20,000
Lost sales due to in efficiency		$ 20,000

Total Cost = $ 114,000

Case Study

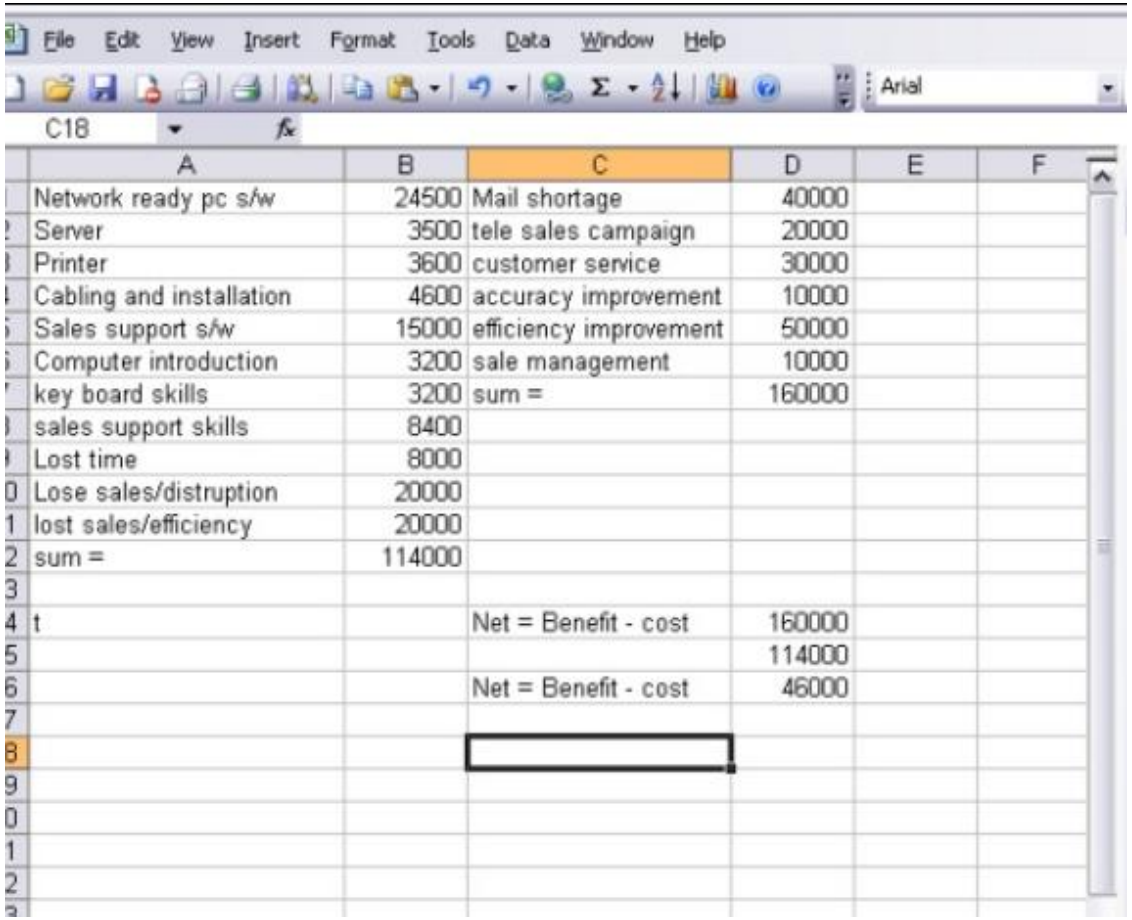
Benefits

Item	Cost
Tripling of mail shot capacity	$ 40,000 / year
Ability to sustain telesales campaigns	$20,000 / year
Improved customer service and retention	$30,000 / year
Improved accuracy of customer information	$10,000 / year
Improved efficiency and reliability of follow-up	$50,000 / year
More ability to manage sales effort	$10,000 / year

Total Benefit: $160,000/year

Payback time: $114,000 / $160,000 = 0.63 of a year = approx. 8 months

Results



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Arial

C18

	A	B	C	D	E	F
	Network ready pc s/w	24500	Mail shortage	40000		
2	Server	3500	tele sales campaign	20000		
3	Printer	3600	customer service	30000		
4	Cabling and installation	4600	accuracy improvement	10000		
5	Sales support s/w	15000	efficiency improvement	50000		
6	Computer introduction	3200	sale management	10000		
7	key board skills	3200	sum =	160000		
8	sales support skills	8400				
9	Lost time	8000				
10	Lose sales/distruption	20000				
11	lost sales/efficiency	20000				
12	sum =	114000				
13						
14	t		Net = Benefit - cost	160000		
15				114000		
16			Net = Benefit - cost	46000		
17						
18						
19						
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21						
22						

CBA Example

Year	*Project 1*	*Project 2*	*Project 3*	*Project 4*
0	-100,000	-1,000,000	-100,000	-120,000
1	10,000	200,000	30,000	30,000
2	10,000	200,000	30,000	30,000
3	20,000	200,000	30,000	30,000
4	20,000	200,000	20,000	25,000
5	100,000	350,000	20,000	50,000
Net Profit	60,000	150,000	30,000	45,000
Payback	5	5	4	4
ROI	12%	4%	10%	11%

Cost-benefit Evaluation Techniques

- Net profit
  = Total income – Total costs
- Payback period
  = Time taken to break even
- Return on Investment (ROI)

$$= \frac{\text{average annual profit}}{\text{total investment}} \times 100\%$$

Cost-benefit Evaluation Techniques – NPV

- Net present value (NPV)
  - It is the sum of the present values of all future amounts.
  - *Present value* is the value which a future amount is worth at present
  - It takes into account the profitability of a project and the timing of the cash flows
- PVB (present value of benefits)
- PVC (present value of costs)
- BCR (benefit cost ratio = PVB / PVC)

Challenges of CBA

- Accuracy problem
  - Inaccurate cost and benefit estimation
  - Rely heavily on similar projects of past
  - Rely heavily on project members
  - Cant avoid the unconscious bias of team members
- Determination of which cost to include in the analysis

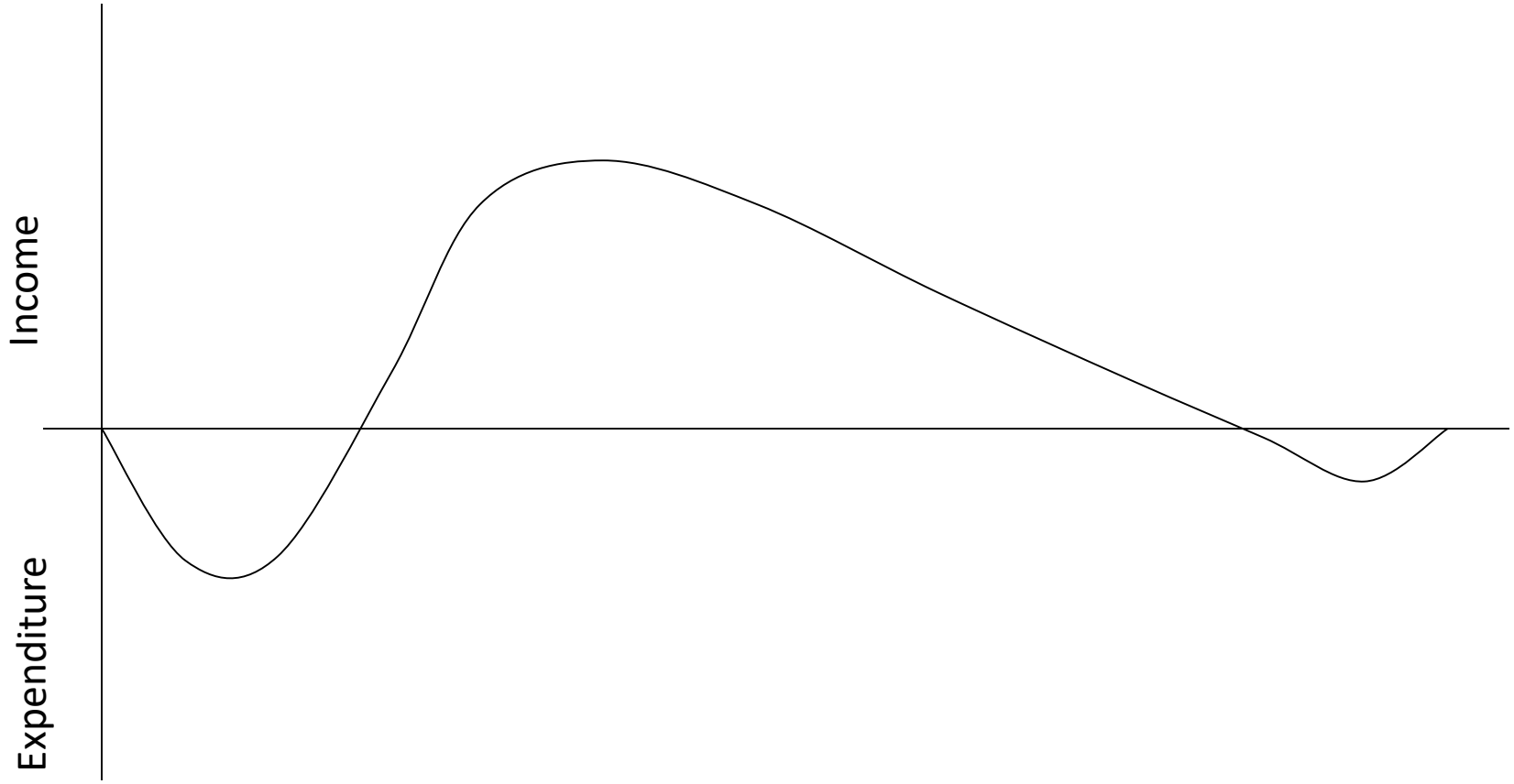
Challenges of CBA

- Performing a Cost-Benefit Analysis is critical to the continuation of a development product
- Superficial attention to its development may result in erroneous conclusions which will lead a company down a path to disaster
- It is important that both costs and benefits be thoroughly defined and scrutinized.

EA – Cash Flow Forecasting

- What?
  - Estimation of the cash flow over time
- Why?
  - An excess of estimated benefits over the estimated costs is not sufficient
  - Need detailed estimation of benefits and costs versus time

EA – Cash Flow Forecasting



EA – Cash Flow Forecasting

- Need to forecast the expenditure and the income
- Accurate forecast is not easy
- Need to revise the forecast from time to time

Trade-Off Triangle

- Good project management deals with three factors: time, cost and performance.
- Projects are successful if they are completed on time, within budget, and to performance requirements.
- In order to bring the many components of a large project into control there is a large toolkit of techniques, methodologies, and tools.

Trade-Off Triangle

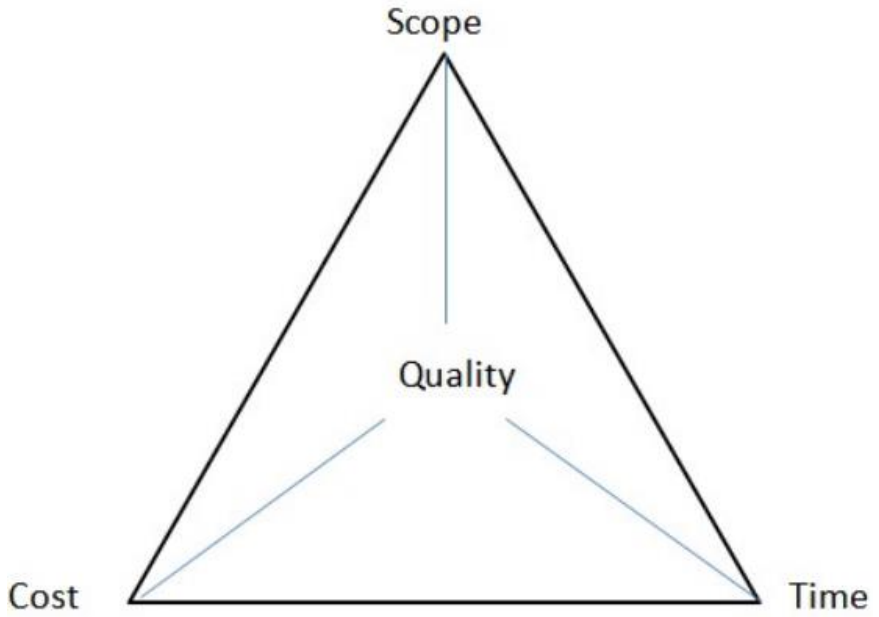
- In managing competing project requirements Project managers often talk of a triple constraint:
- Project scope
- Time and
- Cost
- Project quality is affected by balancing these three factors.

Trade-Off Triangle

- High quality projects deliver the required product or service within scope, on time and within budget.
- The relationship among these factors is such that if any one of the three factors changes, at least one other factor must change.
- Simply put: project success means completing all project deliverables on time, within budget, and to a level of quality that is acceptable to sponsors and stakeholders

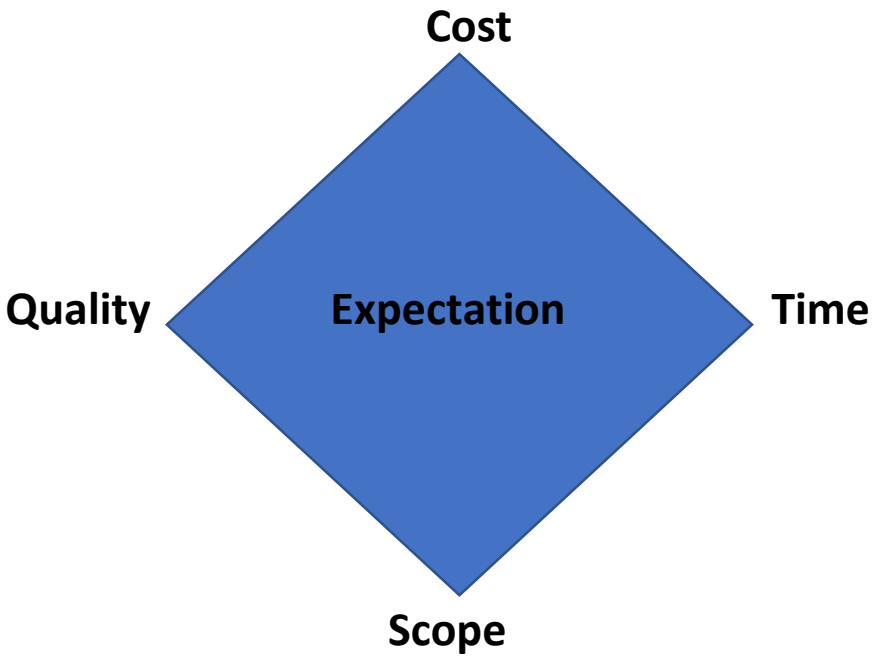
Trade-Off Triangle

- Project management is often summarized in a triangle.
- The three most important factors are time, cost and scope.
- These form the vertices with quality as a central theme.



Trade-Off Triangle

- Projects must be delivered on time.
- Projects must be within cost.
- Projects must be within scope
- Projects must meet customer quality requirements
- More recently, this has given way to a project management diamond, with time, cost, scope and quality the four vertices and customer expectations as a central theme.



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