

Project Selection



Delivering the wrong project on time and on budget with 100% of its scope completed to the defined quality standards is a complete waste of money!

Before value can be created¹ by the traditional project management processes defined in the *PMBOK® Guide*, the project manager has to be given the **right** project to manage. But this is not a simple process.

Selecting the best of the 'right projects' to undertake within the constraints of the limited resources and funding available to any organisation is far from straightforward. This is the realm of Portfolio Management², but the decision-making processes are far from simple or straightforward. Portfolio decision making process are both multi-dimensional and interdependent:

- **Multi-dimensional:** there are numerous factors that have to be balanced to determine the optimum choice
- **Interdependent:** earlier decisions affect the choices available later.

The multi-dimensional aspects of project selection are reasonably well understood and can be modelled in a spreadsheet, some of the factors considered may include:

- Profitability, considering factors such as ROI, BCR, NPV, etc.
- Payback periods
- Benefits realised
- Strategic alignment (or more accurately contribution to achieving strategic objectives), and
- Resource availability (skills, equipment, capital).

Of all of these factors, the project's contribution to strategic objectives is the most important – the organisation needs to be focused on achieving its strategic objectives (see table below).

¹ For more on **benefits and value** see:
https://www.mosaicprojects.com.au/WhitePapers/WP1023_Benefits_and_Value.pdf

² For more on **Portfolio Management** see:
https://www.mosaicprojects.com.au/WhitePapers/WP1017_Portfolios.pdf

The modelling process for strategic alignment looks like this³:

Project Selection Scoring Template											
		Project Candidates									
Strategic Priority	Weighting	Example Project	Name	Name	Name	Name	Name	Name	Name	Name	Name
Measure 1	0.5	5									
Measure 2	0.5	4									
Measure 3	0.5	3									
Measure 4	0.5	1									
Measure 5	0.5	5									
Measure 6	0.5	4									
Total		11	0	0	0	0	0	0	0	0	0

Interdependence is more complicated

Interdependence looks at the relationship between decisions on the projects to proceed with and has many facets:

- **Enabler projects:** Some projects may score very low in a ‘scoring template’ similar to the one above, if considered in isolation, but if the project is not undertaken other high value and strategically important projects may be impossible to undertake effectively. An example is upgrading an operating system – the current system may be perfectly OK for the current applications used by the organisation, but incapable of supporting new ways of working. The value of the project is its ability to ‘enable’ other high value projects in the future.
- **Insurance projects:** These have little of no value in themselves (and you hope they are never tested) but they ‘insure’ the organisation against threats. Security upgrades are a typical example.
- **Associated and supporting projects:** These are the projects in ‘other parts’ of the organisation that have to be implemented to allow the full value of the benefits to be captured from the ‘main project’, particularly if it is very successful. One of the advantages of Program Management⁴ is it allows these supporting projects to be managed in conjunction with the ‘main project’.

³ Template Guidelines

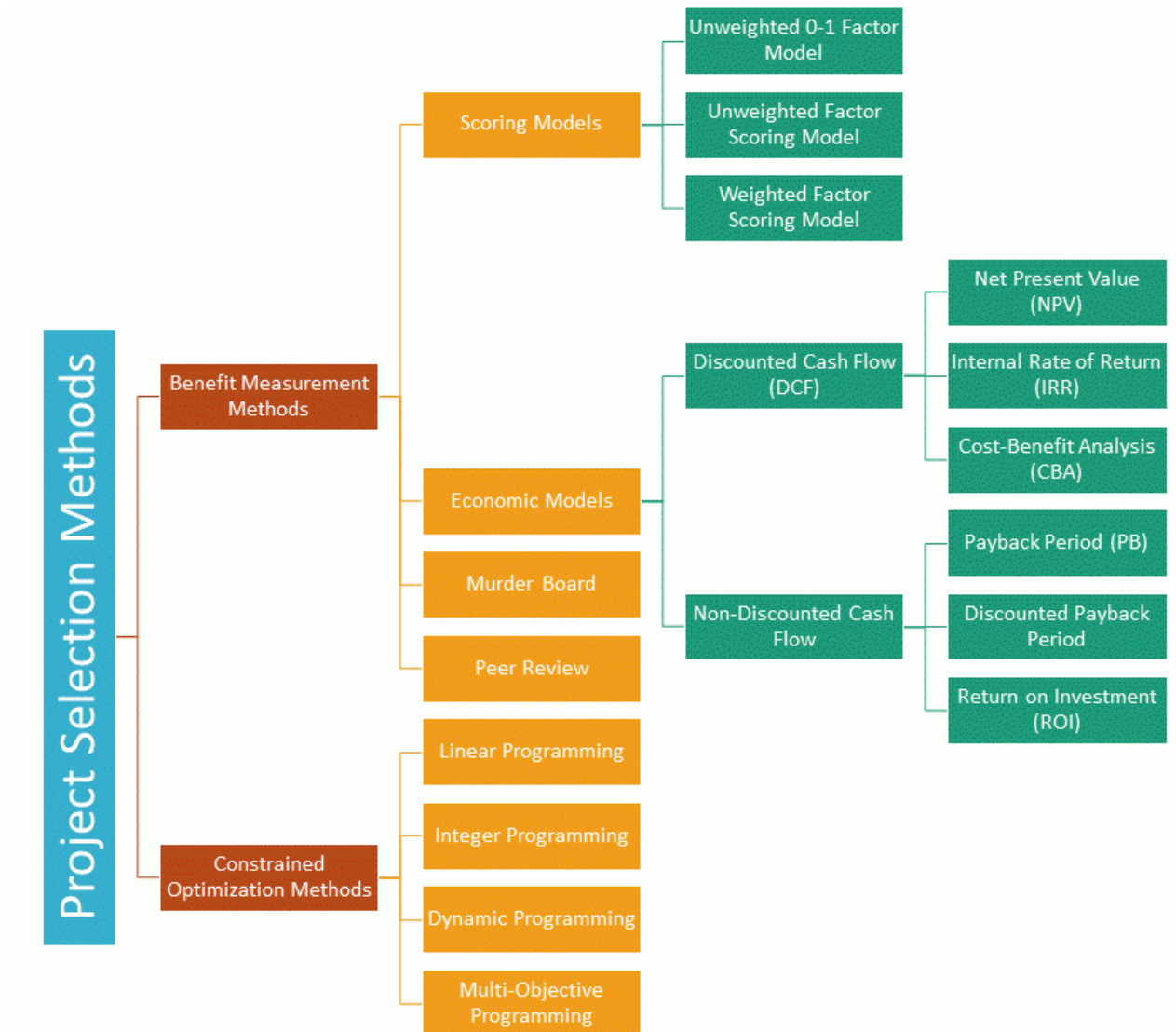
- Strategic Priorities are populated in column A the template limits to 6 different priorities and caution should be taken if extending, you may dilute the priorities too much.
- Column B contains a weighting adjustment for the priorities. The example assumes a weighting between 0 and 1, but any numbers can be used. The higher the number the more the score for that priority will contribute to the overall score for the project.
- Columns C through L represent the candidate projects. The template is set up for 10 but you can extend as needed.
- The example project has some sample data populated and I have assumed a value of 1 - 5 in the score, but again, you can use whatever you want as the total will adjust appropriately.

⁴ For more on **Program Management** see:

https://www.mosaicprojects.com.au/WhitePapers/WP1076_Program_Management.pdf



Factors in project selection



The economic models above can be used to reject projects that are not viable, and then to rank the viable projects that capable of being accepted:

Project Selection Method	Project Selection Criteria	Decision
Net Present Value (NPV)	Positive Value $NPV > 0$	Accept
	Negative Value $NPV < 0$	Reject
Internal Rate of Return (IRR)	Greater than threshold	Accept

Project Selection Method	Project Selection Criteria	Decision
Cost Benefit Analysis (CBA)	Less than threshold	Reject
	Greater than one CBA > 1	Accept
	Less than one CBA < 1	Reject
Return on Investment (ROI)	Greater than threshold	Accept
	Less than threshold	Reject
Payback period	Less than threshold	Accept
	Greater than threshold	Reject

Time Value of Money

Time value of money is an equally important finance concept that helps understand economic or profitability project selection models. It simply means that money received now has more value than the same amount received in future. The value of money is influenced by inflation and risk. Hence, any investor seeks compensation for the above factors that erode its returns.

The risk-free rate of interest compensates for time as well as inflation, whereas risk premium provides a cover for investments risks. Therefore, the interest rate helps to convert future cash flow to an equivalent amount of money in the present time.

Present Value

Present Value (PV) is the current value of future cash flows. Computing present value uses the principle of discounting:

$$PV = \frac{FV}{(1 + k)^N}$$

Where; k = discounting factor / interest rate and N = Number of time periods

Future Value

Future value (FV) is the value of current investment at any specified future date. Computing future value uses the principle of compounding.

$$FV = PV \times (1 + k)^N$$

Where; k = discounting factor / interest rate and N = Number of time periods



Net Present Value (NPV)

NPV is a profitability model that uses discounted cash flow. In order to select a project, it converts all future cash flows to their equivalent present value. To compute the sum of all equivalent present value of cash inflows less present value of cash outflow to obtain a single value for the overall project.

$$NPV = \sum_{t=1}^N \frac{FV_t}{(1+k)^t} - PV$$

A positive NPV means that the sum of present value of future cash flow is greater than the cash outflow. When comparing NPV values of two or more projects the project with the highest NPV is preferred. A negative NPV means that the sum of present value of future cash inflow is less than the cash outflow. This implies that the project is not-profitable, but may be necessary for other reasons.

Internal Rate of Return (IRR)

The output of IRR is an interest rate at which the project neither makes profit nor any loss based on its discounted cash flow. IRR is different from NPV in that the calculations find the interest rate at which NPV is equal to zero. Internal Rate of Return Formula

$$IRR = [\text{Sum of present value of all future cash inflows}] - [\text{Cash outflow}] = 0$$

The higher the interest rate, the better the project, but to be profitable, this rate needs to exceed the desired rate (or the cash rate).

Cost Benefit Analysis (CBA)

Cost Benefit Analysis (CBA), alternate names of cost benefit analysis are Profitability Index (PI) and Benefit Cost Ratio (BCR). Mathematically CBA is the ratio of present value of cash inflows to cash outflow.

$$CBA = \text{Sum of Present Value of future cash Inflow} / \text{Project Cash outflow}$$

The project is profitable if the ratio is greater than 1, and generally the higher the CBA the better.

Return on Investment (ROI)

Return on Investment (ROI) is a financial ratio that uses net profit from an investment as a measure for project selection. To measure profitability of an investment proposal ROI uses accounting information in financial statements (it does not use discounted cash flow information). ROI is the ratio of average profit after tax to average investments, but different authorities use different ROI formula.

$$ROI = \text{Average Income} / \text{Average Investment}$$

Where; average income = average profit after tax; and average investment = average book value of the investment between the beginning and end of the time period.

Organizations typically establish a minimum rate of ROI as a mandatory criteria for project evaluation.



Payback Period (PB)

The payback period (PB) indicates the number of years (or months) required to recover the initial project investment. It does not take into account the effect of time value of money by discounting future cash flows.

Payback Period (PB) = the time period through to the point where total cash inflows are equal to the initial cash outflow.

As a management directive many organizations have a standard pre-determined payback period. During the project selection process compare payback period of a project against the standard payback period. Accept a project if the payback is less than the standard payback period mandate. However, reject a project if the payback is greater than the standard mandate.

Rigorous evaluation is required

It is far too easy to get carried away by a 'grand vision' or a dominant/charismatic leader. Big ideas need careful evaluations as the 'Virgin Lands' project from the 1950s demonstrates.....



In 1954, the production of wheat, meat and dairy in Soviet Union had plummeted to historic levels. Russia, a traditional exporter of grain, was forced to buy it from abroad. To reverse this situation, Nikita Khrushchev, came up with what appeared to be a very creative solution to the grain shortage problem. The new Soviet leader commissioned the 'Virgin Lands Project'. The goal of the project, as worded by the Soviet Gosplan (Ministry of Planning), was to "harvest 20 million tons of grain by ploughing at least 43 million hectares of 'virgin lands' in several areas of the country including Kazakhstan."

The project has begun with an army of several hundred thousand volunteers, including students, soldiers and agricultural professionals; plus, 50,000 tractors and more than 6,000 trucks were moved to the area to assist the 'project team' in preparing and ploughing the vast areas of land. As a result of these preparations in the first year of the programme, 190,000 km² were ploughed; in 1955, an extra 140,000 km² were ploughed.

The 1956 was a year of great success for the 'Virgin Lands'; the original target of 20 million tons was more than tripled, with 60 million tons wheat being harvested. Unfortunately, the government was not prepared for a harvest of such proportions. A lack of storage barns and harvesting equipment, and the Transportation Ministry having failed to reserve enough freight trains to move all of the grain to major cities led to immense losses.

The 'main project' at the centre of the 'virgin Lands' was successful in the short term but failed overall because critical factors including the weather and the need for erosion control were ignored. The grain produced was also significantly more expensive than grain from traditional farming areas. The value was further damaged by the failure of other entities within the overall scheme to be adequately prepared.

In the 1950s this failure may be understandable, in the 21st century we have program management to deal with the multiple interdependent aspects of the overall work and portfolio management to make sure the assumptions underpinning the vision are sound. Applying program and portfolio management is a

management function – ensuring they are used, and used effectively by management is the role of governance.

The governance factors

Governance is critically important in all aspects of project selection⁵. Good governance is far more than just implementing systems and checks, it creating an organisation focused on achieving its objectives the ‘right way’. The governing body needs to create a management culture that is prepared to implement good processes.

In any ‘simple scoring models’ the system has to ensure the reliability of the data, take into account uncertainty and allow ‘bad news’ to be properly incorporated in the decision-making process. More subjective processes need to ensure the subjectivity in the decision making is focused on the good of the organisation, not the ego of the decision maker, and all factors are properly considered.

The ‘Virgin Lands’ project discussed above ignored the known meteorological information that there was only a 40% chance of favourable weather conditions in Kazakhstan in any given year. Plus the risks and consequences of ploughing ‘virgin land’ were also ignored; as a result, after several years, due to lack of any measures to prevent erosion, much of the soil was simply blown away by the 95-mile-an-hour winds covering many nearby towns with dirt and dust to a depth of up to six feet. Incorporating these ‘unpleasant facts’ into the decision-making processes would have led to the project being redesigned or scrapped. The primary mission of removing the need for grain imports to the USSR may have justified the additional costs (this is a subjective value-based judgement), but the project as implemented failed both its primary and any other objectives.

Governance does not sit in the place of portfolio management, portfolio investment decisions are very much the responsibility of executive management, but it should ensure management focuses on making principled decisions based on the best available information – governance sets the objectives. Framework, and rules for management to work within to achieve the objectives.

Project Portfolio Management is the key

Project Portfolio Management (PPM) is defined as a methodology for analysing, selecting and collectively managing a group of current or proposed projects based on numerous key characteristics, while honouring constraints imposed by management or external real-world factors⁶.

The three key requirements that portfolio management professionals impose on every candidate project or program are:

- Each project as well as the portfolio of projects should maximize the value for the organisation.
- The candidate project should preserve the desired balance in the portfolio mix.
- The final portfolio of projects is strategically aligned and truly reflects the business's strategy.

⁵ For more on *the key role of governance* see: https://www.mosaicprojects.com.au/WhitePapers/WP1096_Six_Functions_Governance.pdf

⁶ For more on *Portfolio Management* see: https://www.mosaicprojects.com.au/WhitePapers/WP1017_Portfolios.pdf



The definition of "value" can vary from company to company and even from project to project but typically it includes certain economic measures (e.g. return on investment, net present value, and payback), competitive advantage, market attractiveness, expected sales, probability of success, etc.

The "balance requirement" ensures that the following situations are successfully avoided:

- Too many small projects and not enough breakthrough, visionary projects
- Too many short-term and not enough long-term strategic projects
- Certain business areas are receiving a disproportionate amount of resources
- Poor risk management (all eggs in one basket)

Finally, the "fit to the strategic goals" requirement makes certain that company finances and other resources are not wasted on ventures outside of the organization's sphere of strategic interests. The simple fact is executives do not go to shareholder meetings and cocktail parties to brag about what a professional group of project managers their organisation has. Their mission is to make more money or (in a non-profit organization) to achieve their specific goals. They want to know if the mix of projects will maximize long-run growth and ROI for the firm, how these projects support strategic initiatives, and how they will affect the value of the company's stock.

Effective PPM is a key competitive advantage for every type of organisation (no one can afford to waste resources). The reasons this is important are outlined below:

- The Project Management Institute found that in 2001 the US public and private sectors combined spend approximately \$2.3 trillion on projects every year. This represents some \$10 trillion worldwide being spent on projects.
- 84% of companies either do not conduct business cases for their projects or perform them on select key projects only.
- 89% of companies are flying blind with no metrics in place except for financial data.
- 84% of companies are unable to adjust and realign their budgets with their business needs

As a consequence, there was close to \$1 trillion in underperforming projects in US as of 2001 and \$4 trillion worldwide – the situation has not improved much since! We will return to this theme in a future!



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