

NPV and strategic value

Surveys in feasibility analysis techniques used by top 100 listed companies both in Australia and around the world consistently show that Net Present Value (NPV) is still not the tool of choice. This is despite the fact it has been academically proven to be the only true measure of how much value a project will create for the business. Some reasons often put forward for why NPV is not used include:

1. NPV is a black box
2. Management like percentage (%) return figures and hence prefer to use the potentially dangerous IRR measure of the project value.
3. Management like to know the payback period for a project and prefer to invest in projects that return positive cash flow - quickly
4. Negative NPV assessments are often dismissed due to the project being justified simply by saying it is "Strategic" without confirming the value to be created.

This paper will address these issues and outline some techniques that may help convince senior management of the falsehoods of each statement.

Background

MBH Management was founded in November 1999. Its basis for creation was a perceived lack of understanding in Managing by Project and more particularly project management practices in most Australian corporations. MBH believes there is considerable scope for growth of project management and MbP as a corporate culture across all industry types and business sizes. MBH has a vision of Australian businesses adopting the MbP approach to change and growth and sees itself as being a leader in facilitating that change and thereby delivering growth to clients. Our strategy to take advantage of this potential growth is to build a suite of products and services based around an MbP methodology. MBH has already developed a unique Intranet based MbP methodology based on 6 modules and designed to skill up internally both strategic management and project management as core competencies of the businesses we support.

What is MbP?

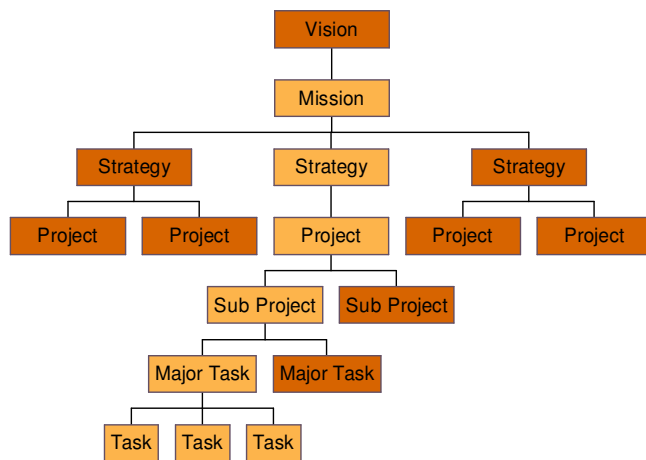
Managing by Project is a business management philosophy that utilises four major principles in managing any organisation. These principles are:

1. The company vision: What the company will look like in the long term or its reason for existence
2. Strategy: The development of the high level approach of how the company will go about achieving its vision
3. Project selection: Ensuring that each project selected aligns to strategy **AND** adds shareholder value to the business
4. Project Management: The delivery mechanism for each project selected.

MBH's Managing by Project methodology first creates a selection and prioritisation process that ensures strategic alignment of each initiative. It also ensures that the project has been assessed both quantitatively and qualitatively in terms of the competitive or strategic value that the project creates. It utilises NPV and option pricing to provide a priority rating for the projects that are selected. The MBH Managing by Project methodology then provides the process for developing, tracking and implementing the project via a unique project management approach. This approach utilises a facilitated style, directly involves the customer in all that is being developed and brings together cross-functional teams to develop and implement the project. These three factors

(customer involvement, facilitation and cross-functional teams) ensure that the change that each initiative creates is managed as painlessly and easily as possible.

The overall process of MbP can be highlighted with the following work breakdown structure:



This chart highlights how MbP can inspire people working today to implement the vision of tomorrow. Each task has a direct link to delivering the vision that the company aspires to.

The benefits of implementing an MbP culture into any business are:

- ☑ Do more with less
- ☑ Fluid structure that removes the static 3 year business planning cycle
- ☑ Concept to reality life cycle is shortened thereby inducing a faster implementation of innovation
- ☑ Generates better ideas along all phases of a projects life through utilisation of cross-functional teams
- ☑ The right projects are selected, reducing the number of projects that are abandoned and the time taken to abandon the ones that aren't working thereby minimising non-value-adding work
- ☑ Ultimately delivers the vision of the company

NPV as a black box

A black box is something we accept and use but do not understand. For senior management to accept that negative NPV projects should not be approved, the black box needs to be removed. In order to remove the black box tag, each project champion must understand how the NPV number that is produced is actually calculated. They need to articulate the real benefit drivers of the project and how this project aligns to the current business strategy.

Benefits of NPV

Firstly, NPV allows risk ratings to be incorporated into the assessment of a project. The risk rating allocated to a project determines an adjusted discount rate used to calculate the NPV. Secondly, it is essential to understand what factors create positive value and to articulate why a project should be selected in terms of the value it will create to the business. Thirdly, the NPV calculated for each project then creates an instant prioritisation process: the largest positive NPV is the top priority project since it will add the most value to the firm, (hence it is important to use a correct discount rate relative to other projects and the current business risk rating).

NPV Calculation

In completing an NPV calculation, the following steps are completed:

1. The **benefit drivers** of the project are identified and quantified
2. The **costs of the project** are estimated
3. The **ongoing costs** created by the project are estimated
4. The riskiness of the project is compared to the current risk profile of the company. If the beta (risk rating) of the project is the same as the companies then the **Weighted Average Cost of Capital** (WACC) is used as the discount rate. If it differs then the discount rate is adjusted appropriately.
5. The cash flows calculated in steps one to three are discounted by the discount rate assessed at step four to produce the projects **Net Present Value**.

Strategic value and NPV

Basic microeconomics rises from the assumption that, over time, an industry will settle into equilibrium. In this case, all assets are expected to return their respective opportunity cost of capital. The assumption behind this is that if an industry is earning more than its opportunity cost of capital, more businesses will enter that industry or individual businesses in that industry will expand. Companies that create value greater than the opportunity cost of capital employed are seen to be companies that have some sort of strategic or competitive advantage. This may be temporary (i.e. industry equilibrium has not been reached) or long term (i.e. a continuing monopolistic environment exists). The only way that a project can have a positive NPV is for it to have some sort of strategic or competitive value (these two terms are synonymous in this sense).

In the introduction, some of the reasons for not using NPV were put forward. This paper proposes that NPV should be the **only** assessment tool needed for determining the value created by a project. It also highlights the need for each executive to probe behind the black box and identify what drives the positive competitive advantage the project produces.

Advantages of this nature can arise in several ways. Being first to market with a new product, registering patents, developing intellectual property, or creating a production cost advantage over competitors are examples of transitory competitive advantages. Cartels (OPEC) or government-regulated monopolies are examples of long-term competitive advantage. As can be seen from the examples described above, most businesses can only hope to create temporary competitive advantages. This highlights the need for companies to continually reinvent themselves. As business cycles shorten and competitive advantages become more fleeting, the need for innovation becomes critical.

The need to continually innovate increases the importance of calculating NPV on each project that is sponsored within the organisation. To determine NPV, a project champion must determine the benefit drivers of a project, then estimate the level of that driver and forecast the cost of generating that benefit. This information is the exact data inputs that are required to implement other management tools like balanced scorecards and risk management. Techniques like Monte Carlo simulation and decision tree analysis only begin once the base case NPV has been completed. It is only once a decision has been made to invest that balanced scorecard can add value to the overall process. NPV (or variants branded by consultants) is the only way to truly value the potential benefits of a project and the competitive advantage it will create. Tools like balanced scorecard, decision tree analysis, Monte Carlo simulation and basic sensitivity analysis can all help to remove the black box enigma from the NPV result, but also have a tendency to become black boxes themselves. They become the tracking mechanisms for subsequent investment decision to abandon or to re-invest but these tools should never become the assessment tool for the decision that is made.

A project can be implemented within the constraints of time, cost and quality but if it is the wrong project for that company strategically, then it will rarely deliver the benefits of ongoing value to the business. The only way to determine whether a project is going to add value, (i.e. create a competitive advantage), is to isolate the benefit drivers, put a value to those benefit drivers,

calculate the cost and discount the whole lot back to present value. If the value is positive then the project is definitely worth pursuing.

In the end, if a business team fails to understand how value is created by the project being assessed (thereby removing the black box tag) then NPV will be as useful as any of the bogus assessment tools like payback, IRR and ROI. Understanding value drivers is the key to success.

Oh no, my NPV is negative.

What do you do when your project comes up with a negative Net Present Value? The first thing to check is the underlying competitive advantages of the project (see above). You may be undervaluing the strategic value of the initiative. Secondly, you should check all revenue and cost assumptions. If your project still has a negative NPV, does this mean your project should be cancelled or your idea discarded? NOT NECESSARILY!

What has to be understood is that NPV calculations neglect the options sometimes created by investing in the project. NPV is based on valuing financial assets and thereby assumes that the investment is held passively. Obviously, the investment in real assets is not passive. Managers have a variety of options they can exercise every day regarding the use of every single asset in the company. It may be that achieving a "strategic position" in a new product area now will greatly enhance the potential of capitalising on that position at a later date with a subsequent project. Sometimes projects are 'phased' to account for this option creation effect. The NPV of that subsequent project, when combined with the original, makes the original project investment viable.

What is being described here is the value of options created on investment decisions made today. If Microsoft had not invested in MS DOS operating systems, then it wouldn't have created the option of subsequent GUI operating systems like Windows 3.1, Windows 95 etc. The original MS Dos application could have been perceived to have a negative NPV, but subsequent products had a much lower incremental cost and a much greater revenue stream than what would have occurred if they hadn't undertaken the first development project.

So, how do we value these options? Thankfully, the legends at Long Term Capital have come up with a formula that does it for us (even though the incorrect use of their model nearly brought down the world financial system in 1997)! All you need is the Present Value (PV) cost of the second project, the PV cash flows of the second project, the time before an investment decision has to be made, and the standard deviation (or volatility) of the cash flows forecasted (for most IT projects, this can be set at 45%). With these numbers and a *call option normal distribution table*, a simple calculation will result in the value of the option. The final step is to add this option value to the NPV calculated for the first project and if the sum of the two projects is positive then you have a positive NPV project, therefore worth undertaking.

The process described above represents valuing the benefits of strategic intent. If your company does not have a strategic intent, then count the days before the retrenchment cheque is presented on your desk!

Payback and the need for profit NOW!

The biggest error made when analysing capital investments (or investments in real assets) by corporate Australia is the desire for short-term returns. Management's duty to announce ever-increasing profit growth (quarter on quarter) leads them to invest in short payback periods rather than projects that would offer greater value over the long term. It is the demand from city analysts for ever-increasing profits from the businesses they invest in combined with their use of a

maximum 5 years when applying **discounted cash flow (DCF)** analysis when valuing companies that leads to this short term focus. Most analysts apply a residual amount to a company's cash position after 5 years. This residual is usually the last year's cash flow calculated in perpetuity. It is my belief that this perpetuity calculation is the bane of capitalism. To come up with the share price of a firm's existing business, the sum of the DCF, plus the residual value, is divided by the number of outstanding shares in the company. This analysis only reflects the growth options created by past years' projects and the value of the projects to be implemented over the next 5 years. A paradigm shift needs to occur in the thinking of the modern investment analyst. There needs to be the removal of the perpetuity calculation (there is a clue here to the solution of the hotly contested triple bottom line). There are two critical assumptions behind this principle of perpetual existence:

- All blue chip firms are and always will be a going concern
- The rate of growth of a firm ceases after five years

Is it a valid assumption that blue chip companies are a going concern forever? I believe recent examples like HIH and Ansett prove that this is not a valid assumption. A subtler example is the proposed takeover of Compaq by Hewlett Packard. The PC industry is just 20 years old and yet major founding companies are already becoming rationalised out of existence.

If the perpetuity assumption was removed, what would replace it? Analysts would have to delve deeper into the capital budgeting programme being carried out by each company. If that analyst could not find the innovation required for the company being assessed to remain a going concern, then the DCF model would be adjusted accordingly. Growth rates for the next 5 years may be kept the same, but negative growth may be input for the remaining 20 years (cash flows greater than 25 years when discounted start to become immaterial). This would result in a significantly lower share price value for that company than the level it currently affords. Over time, managers would come to realise that to achieve their share option exercise price, they either have to continually convince their board to lower the share price hurdle or invest in longer term projects that are truly positive NPV projects. These projects will provide the firm with a future that goes beyond the next reporting period.

Initially, share prices could fall by around 10-20%. But over time, boards and senior executive would look to establish re-ratings based on the long-term vision and the overall management processes on achieving that vision. We've seen BP become Beyond Petroleum and as this vision becomes clearer, their share price will become less affected by the swings in oil prices. The knock-on affect to achieve this re-rating would be that projects would be developed towards more sustainable solutions. Economic value and environmental value would become aligned and performance would be based on the true value a firm creates (i.e. its value to society as a whole). With this type of investment evaluation, the use of option pricing on real assets would become even more important.

This long term planning and implementation is not unique through history, but it would be the first time it will have been achieved in a free society with the laissez faire movement of resources.

IRR: why it's used and why it's dangerous.

Most people when talking financial matters like to talk in terms of returns. These returns are always expressed in terms of percentages. Board members, managing directors, and executives in Australia aren't any different to the norm and it is for this reason that executives often demand the financial analysts present their analysis on a project's worth in terms of its Internal Rate of Return (IRR). If this IRR is higher than some pre-defined hurdle rate (hopefully, the company's opportunity cost of capital), then the project is perceived to be of value and should go ahead.

The only time IRR gives the same result as NPV is when the cash flows and hence the NPV is a smoothly declining function of the discount rate. Where a project has a considerable time horizon or when its cash flows fluctuate during the life cycle, then the chances of the IRR result calculated being in error is heightened. There are three main areas where IRR provides an erroneous answer when making a capital budgeting decision they are:

Are you lending or borrowing?

Cash flow is not necessarily smooth throughout the project. Consider the example of writing a book: The publisher lends money to the author (i.e. project receives capital injection) then spends the money during Year 1 and Year 2 (creating negative cash flow in Year 2). In Year 3, the publisher lends to the project again which is followed again by cash outlays to form a negative cash flow in year 4. The results is that the IRR will potentially give a dubious answer because of the changing sign positive/negative) of cash flows in each year.

Multiple rates of return

Under the same cash flow scenario outlined in 1 above (i.e. multiple changes in the sign of the cash flows over the time period invested), many projects will return more than one IRR. How? The calculation of IRR is simply any number that will solve for $NPV=0$ thus there can be more than one number that solves the equation. So, why not just calculate the NPV?!

Mutually exclusive projects

IRR's calculated on mutually exclusive projects with differing upfront investments can lead to erroneous choices. The cause of this error can be removed if the more expensive project is analysed on an incremental basis compared to the less expensive project. However, the chance of this being done is low, and the temptation to make the straight comparison of IRR between one and the other is too great for most analysts.

This is why being able to supply a simplistic rate of return to an executive or board may enable that team to feel comfortable at the corporate round table but it won't actually solve the problem of which projects are best to invest in.

Conclusion

The main thread of this paper is to highlight the importance of proper feasibility assessment on the initiatives that are put forward within the business. Even if a company achieves a strong project management culture and utilises modern tools like earned value and balanced scorecards, it still won't achieve its vision if it delivers the wrong projects. Our strong recommendation is that NPV and option pricing be the only quantitative measures used when assessing the viability of a project. Furthermore, the executive must understand the benefit drivers both qualitatively and quantitatively that sit behind the NPV number. It is the tracking of these benefit drivers, along with the tracking of the project's implementation that will aid further decision-making throughout the project's life cycle. The benefit drivers that create the value within the project can then be incorporated into the tracking tools of the business (eg: Balanced scorecard).