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Decision-making for councils and not-for-profit agencies, including budget dependent government agencies

MAKE A PROJECT PROPOSAL THAT DECISION-MAKERS CAN UNDERSTAND

Abstract: *When the benefits from your proposed project are mostly not in the form of revenues; commercial tools such as NPV, C/B, IIR are at best inappropriate, at worst, a confusing waste of time leading to expensive mistakes. Reducing costs to annualised costs makes more intuitive sense to decision makers and allows them to more easily compare costs and benefits.*

Do your decision makers (board members, councillors, senior management) really understand the issues that underlie cost-benefit analysis, net present value discounting, internal rates of return?

Chances are they don't! Chances are, you don't!

Why? **Because the messages from C/B, NPV, and IIR are not intuitively obvious – and neither are the traps!** (see p. 154)

In this issue we look at the traps and suggest a better method suited to those decisions where

- unlike proposals are being considered against a budget constraint
- the costs, but not the benefits, can be quantified

See over

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This issue of *SAM* was inspired by a paper presented to the International Public Works Conference in Perth, Aug 29, by John Howard, Cairns City Council. My thanks to John for his permission to use his annualised cost idea and examples.

CB of 5:1 (Story 1)

A friend in transport economics asked what CB ratios applied to most non-road infrastructure proposals.

Me: "They would be lucky to scrape 1:1—and that only on paper!" I replied.

F: "Then why does the Government not spend more on road projects where we can get a 5:1 ratio?"

Me (based on observing Ministerial behaviour): "They don't believe you—and *they can't check* - so they chuck away the analysis and go by gut feel!"

CB of 5:1 Story 2

Value management studies uncover a wealth of useful information! During one such study the team found out why the road authorities projects had a CB of 5:1. Quite simply the authority calculated the costs and then assumed that the benefits would be five times as great because 'everyone knew' the CB would be 5:1. Incredible though it seems this is true!

FINANCIAL EVALUATION TOOLS AND THE TRAPS

Are you making a 'commercial' decision?

Tools such as NPV, C/B, IIR, and even the 'rough as guts' payback period criterion are designed for situations where you have a series of alternatives to evaluate and where for each one there is *a readily defined stream of cost and revenues*.

But how many of your proposals are like this? If you find that for most of your proposals, the benefits are not in the form of revenues or reduced ongoing costs, but are mostly in the form of increased or improved services, these commercial tools may not be valid at all.

Let us look at some of the problems of using commercial evaluation tools for non-commercial propositions. (And then, on p. 157, we will look at an alternative that does work well.)

Net Present Value (NPV)

The net present value is the discounted sum of the stream of costs (negative) and revenues or benefits (positive). Discounting is an important element in any project that involves benefits or costs distributed over time. But it is often hard for practically-minded decision-makers to understand such an abstraction as NPV. (Added to this are the difficulties engendered in getting the discount rate right—see *SAM* Issues 55 and 56 "Selecting the Right Tool for the Job—Discount Rates")

Cost Benefit (CB) Analysis

This the "tool of choice" by most academic economists. CB analysis requires that all benefits that are not naturally in dollar terms (i.e. not in the form of revenues) be estimated by some proxy. Thus social, environmental, aesthetic, safety and other factors would be represented in the analysis by proxies.

This presents two dangers; the first is that the weightings given to each of the 'non-revenue' elements is determined, not by the decision-maker but by the analyst; the second is that all of these weightings are 'hidden' in the analysis which takes on the form of a 'black box' spitting out the answer 5:1. How this is arrived at is almost impossible to tell except by another analyst retracing the entire analysis.

(see side bar)

IRR and the Dam Proposal

While I was Advisor to the Minister of Construction in Tasmania, there was a cabinet proposal to build an irrigation dam. The Internal Rate of Return was 4%. The real rate for borrowing at the time was about 7.5%. That meant we had to pay 7.5% to get a return of 4%!

When I asked why was this project proposal not chucked in the bin as a blatant non-starter, the reply was almost invariably along the lines of: "Well, I know that 4% is not very large, but it IS positive!"

And, of course, that's the problem, it *looks* positive. If we said that the return was "minus 3.5%" which is what it represents, how many would have persisted?

Corrections SAM 65

Bruce Norton (W.A) has drawn my attention to some errors in SAM 65 "A UK Update". Under the heading of Private Public Partnerships I refer to "- as witness the problems with British Underground (see next item)". This should read "British Rail". Later, in the British Rail item I refer to similarities with the Granville Disaster in the Blue Mountains. Actually the train was coming from the Blue Mountains (which is significant for what happened later) but did not occur IN the Blue Mountains. Finally as no 'companies' were involved in this exercise, but were public sector entities - the State Rail Authority, a NSW Government Statutory Authority - the word 'agencies' would have been better.

Internal Rate of Return (IRR)

The Internal Rate of Return is the discount rate at which the NPV is zero. It assumes that each year, the revenues minus the costs are invested (or borrowed if the net sum is negative) at this same IRR rate which is expressed as a percentage. If the IRR percentage is greater than the cost at which capital can be borrowed, the project is considered feasible.

The main problem with IRR is that many decision makers simply do not understand it! (see sidebar)

Some of the traps with IRR

- Did you know that under certain circumstances there can be 'multiple solutions' to the IIR calculations, (ie two different rates!)
- Did you know that if you include estimates for non monetary benefits in an IIR calculation, (eg a proxy for social or environmental benefit) you are implying that these non-monetary benefits can be invested and yield a financial return?

Payback Period

In the commercial world where future returns are heavily dependent on the fickle hand of fashion or where technological change is very rapid, the payback period is often chosen as a combination of evaluation and risk reduction—the shorter the payback period, the more likely are the returns to hold up. The payback period simply adds the expected net revenues in each period and calculates the period in which the total revenues exceed the initial cost; there is no discounting.

Ranking

All of the methods can be used to rank projects; however, it does not naturally follow that they will all produce the *same ranking*.

And, of course, as John Howard points out:

What do we tell our Councillors?

This project should proceed because

- NPV is \$5.4m, or
- B/C is 1.34, or
- IRR is 6.5%, or
- Payback period is 4.3 years

What message do they receive?

Lack of competition produces lazy habits—Ansett Airlines.

When the Ansett* problems first surfaced with the grounding of its planes by the Civil Aviation Authority it was reported on SBS that Sir Peter Abeles had returned from one International Airshow fascinated by the airbus; so fascinated that he had ordered a number of them for the Ansett fleet without any consultation with his staff. The speaker said that the Ansett fleet had so many different types of aircraft that simply maintaining the required spares for them all was a costly nightmare. How could this happen? Very simply, under the traditional two-airline policy, all airline costs were simply passed on to the consumer. No competition. (Quite clearly, Ansett also had no workable Asset Management Strategy.)

**(for overseas readers: for many years the Australian domestic aviation industry was a two horse race with just Qantas and Ansett. In recent years a number of attempts to break into this duopoly market have come to nought, except for Virgin Blue that now holds about 10%. All in all, not a very competitive market.)*

(Some reasons) WHY WRONG ASSET ACQUISITION DECISIONS ARE MADE

Proposition to consider:

More costs are wasted by acquiring the wrong asset than by poor asset management at all future stages of the life cycle put together!

I cannot prove this, but when you consider that maintenance, operating, and even disposal costs are, to a large extent, determined by the nature and design of the asset obtained, it is probably true.

When you add to this the fact that many assets are subsequently found not to provide 'value for money', the probability becomes a near certainty.

Why do we get the 'wrong assets'?

There are many reasons—not all to do with costs, but all of them related to asset management (or the lack of) see sidebar.

However, many problems ARE to do with **the way we present the costs**, perhaps best summarised as

"Complexity overwhelms"

It has frequently been observed that parliamentary works standing committees often end up arguing over the colour of the tiles on the roof, or some other trivial item, when faced with a large and complex, multi-million dollar project. Why do they do this? When faced with complexity they take refuge in something they can understand!

A variant— "Idealism drives"

Idealism will often lead to simple minded thinking. By focussing on only one of a number of outcomes, decision makers can be led to make the wrong choice. This is, in a way, a variant of 'complexity overwhelms'.

COMPLEXITY CAN BE REDUCED

By avoiding techno babble and concentrating on what decision makers can more easily understand, the average annual (or annualised) costs – decision makers are in a position to easily compare costs with the average annual expected benefits.

Annual benefits are easier to 'see' than benefits expressed as sum over an extended period of time. Annual costs are relatively easy to calculate, simple – and enlightening- to understand, and easily adapted to use within an Asset Management Strategy. (By all means do the calculations for NPV, etc, if relevant to the task, but keep them in reserve for they are not the stuff of clear communication.)

REDUCING COMPLEXITY OF COST PRESENTATION: ANNUAL COSTS

EXAMPLE 1. THE PUBLIC BARBEQUE (SOURCE: J. HOWARD, CAINS CITY COUNCIL)

The capital cost of a public barbeque is \$8,000. But how much does it really cost the council in annual cost terms?

Note 1:

This example has expressed costs as simple averages. Greater accuracy would be achieved by calculating an annuity over the period using an appropriate discount rate, but the extra work will probably not change the decision at all!

	Capital	Annual Service Cost	Remarks
Capital	\$8,000		
Annual			
- Interest		\$640	8% p.a
- Depreciation		\$800	10yrs
- Operations		\$7,600	Power, regular cleaning
- Maintenance		\$500	
- Demolition		\$100	\$1K @ 10 years
TOTAL	\$8,000	\$9,640	

Note 2:

This example correctly includes an estimate of the cost to demolish at the end of the expected life. These asset 'exit' costs are frequently overlooked.

The annual service cost is \$9,640 per annum. This shocked the council when the figures were presented for they had not fully taken account of the ongoing cleaning costs that would be necessary to provide a safe facility.

COST PER USE

The next shock was realising what this meant in terms of "cost per use". If the barbeque was used twice a day on average throughout the year, the cost of providing the service would be \$13.20 per use.

The judgement can now be made as to whether the users and/or the community (through subsidy) are willing to pay this cost per use.

ANNUAL COSTS: EXAMPLE 2

PLAYING FIELD FLOODLIGHTING ANNUAL SERVICE COST (SOURCE: JOHN HOWARD, CAIRNS CITY COUNCIL)

	Capital	Annual Service Cost	Remarks
Capital	\$220,000		
Annual			
- Interest		\$17,600	8% pa
- Depreciation		\$11,000	20 yrs
- Operations		\$1200	Power
- Maintenance		\$850	
-Demolition		\$500	\$10K @ 20 yrs
TOTAL	\$220,000	\$31,150	

COST PER USE - AND A FOCUS ON OUTCOMES

Note:

This approach really focuses attention on the specific service to be provided

Provide floodlighting

- for playing field
- to current Australian Standard
- for night football matches (200 lux)
- for four hours
- On Tuesday and Thursday nights
- Between April and September
- For a 20 year period

The annual service cost is \$31,150 p.a. If the field is used for 6 hours per week for 26 weeks, the service cost is \$200 per hour.

Alternatively we can calculate this as:

Cost per match	\$200
Cost per player	
- rugby league	\$7.69
- rugby union	\$6.67
- aussie rules	\$5.55

Are the users willing to pay this sum? If not, who is to pay?

Use of the annual cost approach changes the discussion from a decision on spending capital of \$220,000

to one of the cost of achieving service outcomes and "getting value for money".

ANNUAL COSTS: EXAMPLE 3

TIMBER BRIDGE VERSUS CONCRETE BRIDGE (SOURCE: JOHN HOWARD)

COMPARING ALTERNATIVES

In examples 1 and 2, the asset acquisition proposal was not one of several ways to provide the same service, but rather of the value for money of the service itself. The annual cost approach can also be used to compare alternatives. Consider

Annual Service Costs

(1) Timber Bridge (Life 25yrs)	Capital	Annual	Remarks
Capital	\$67,913		
Annual			
- interest		\$5,433	8% pa
- depreciation		\$2,717	25 yrs
- routine mtce		\$1,073	
- deck renewal		\$1,333	\$8k @ 6 yrs
- fence renewal		\$477	\$5.7K @ 12 yrs
- girder renewal		\$2,258	\$27k @ 12 yrs
TOTAL	\$67,913	\$13,291	

(2) Concrete Bridge (100yrs)	Capital	Annual	Remarks
Capital	\$132,683		
Annual			
- interest		\$10,615	8% pa
- depreciation		\$1,327	100yrs
- routine mtce		\$200	
- fence renewal		\$276	\$6.9K @ 25yrs
TOTAL	\$132,683	\$12,418	

Note 1:

Because of the very long lives involved in these comparisons, discounting would improve the quality of the information

Note 2: Triple Bottom Line

Other costs that could—and arguably should—be taken into account, are the social costs—the costs of disruption to the public every 25 years as the timber bridge is reconstructed, perhaps leaving the public without access for a considerable time. Inclusion of these costs would favour the concrete bridge.

Environmental costs should also be taken into account.

A final note on discounting:

For most decisions—like the barbeque and stadium lighting examples—that are to be considered on the basis of whether the outcomes represent value for money, it is unlikely that the small amount of difference that discounting will make will justify the efforts.

However for decisions that involve comparing two or more options with different time profiles, discounting should be used.

And if you intend to use the costings to work out how much to pay to outsource the services, then you definitely want to use discounting, for the use of undiscounted costs would be handing your contractor a nice little unearned bonus.

WHEN COSTS AND BENEFITS ARE FINELY BALANCED CONSIDER REJECTION!

When costs and benefits are so finely balanced that a small change on either side would change a “go” proposition into a “no-go” proposition (or vice versa) my inclination would be to REJECT it anyway!

Why? **Simple.** Experience shows that costs will always be higher than anticipated and benefits will be lower. So if we start off with a finely-balanced, one-to-one ratio, we will end with a sure loss proposition!

Why should costs be higher if we have calculated them as accurately as possible in the first place? And why should benefits be lower?

Again, experience shows that either at the concept state, the design stage or the construction stage, compromises will have to be made. Maybe someone objects to some element of the proposal and it needs to be adjusted to win their support. In this case either costs rise or benefits fall. Maybe the original design does not fit with environmental considerations or there are some other technical problems not foreseen at the time, and the design needs to be changed. Again costs rise and benefits fall. Ditto at the construction stage. And who has ever managed to correctly cost the handover costs and recover all of the costs of making good.

Given these most likely events, a project should only be a ‘goer’ if the benefits appear to **clearly** outweigh the costs.

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