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AMQ
International's

STRATEGIC ASSET MANAGEMENT

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The Next Frontier

Where do we go next? What do YOU consider should be our 'next frontier'?

In this issue, **Ruth Wallsgrove, Senior Associate, AMCL**, joins me in making the case for capital optimisation.

Asset Management entails the integration of both capital and maintenance decisions. Internationally, we have made great strides in understanding and applying the tools, the principles and the knowledge for the establishment of **Maintenance Optimisation**.

Yet we still have to do this for **capital optimisation!**

What if we could apply the same rigour that we are now able to apply to ensuring the maintenance of the existing asset stock to the task of ensuring that we make the right decisions on capital up front?

Asset Management suggests that we can do this by observing four principles:

The Principle of Clarity
The Principle of Transparency
The Principle of Evidence Based Decision Making
The Principle of Integration.

In this issue we explore these principles and suggest the action steps that could be taken on this next step of the asset management journey.

Please consider - and enjoy!
Penny

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Maintenance Optimisation

Progress internationally on optimising maintenance for infrastructure assets has been building steadily for two decades now.

We understand the cost-risk trade-off for the work we do to our assets to keep them delivering the service we require. Maintenance is a puzzle we can solve, not a problem we still have to worry away at.

Certainly, not every public infrastructure owner has yet had that moment of enlightenment when maintenance ceases to be a cost and starts to look like an opportunity to deliver value. But the proliferation of courses, tools, textbooks, conferences, performance improvements and major savings tells us we can do it.

Capital Optimisation

On the other hand, capital optimisation – ensuring we get the assets required to deliver the service we need cost-effectively through their life – looks a mess. From problems in understanding future demand, economic service levels and future asset requirements to sustainable whole life costs (and not forgetting persistent capital overspends and specification drift), building new assets continues to feel rather like the wild west of infrastructure.

We cannot afford to leave capital decisions just to those involved in design, construction and project management, however skilled and well-intentioned they are. If we want new infrastructure that is economic as well as fit for purpose, we have to shine the torch of asset management at the capital culture as well as decision processes.

We believe a suitable torch can be summarised in four main principles:

The Principle of Clarity

The Principle of Transparency

The Principle of Evidence Based Decision Making

The Principle of Integration.



1. The Principle of Clarity

Clarity for project and program managers

Clear targets...

When projects fail, the problems often surface during the construction phase. However, when traced back to their source, almost every time we see that they begin before construction even starts. They lie in the failure to be clear about what is wanted, what alternatives exist, and what criteria will be used to choose between the options: in other words, they lie in a failure of clarity. Without clear understanding of the goals, it is not possible to correctly assess likely problems in their delivery; and without a clear understanding of priorities, it is easy to understate both the time and budget required.

....that remain clear over time

Large capital projects can take many years to complete. Very often, those who were responsible for the initial decisions and know the critical drivers are no longer with the organisation or in contact with the project. Unless this information is written down and easily accessible, when changes need to be made to avoid unforeseen problems, or to take advantage of new opportunities, there may be none around who remembers the original intent.

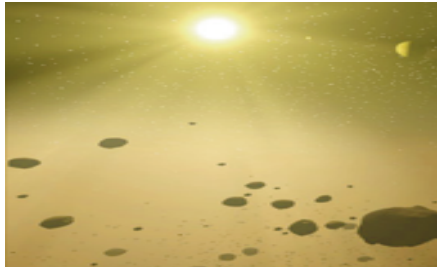
Clarity for corporate decision-making

Projects only begin to make returns once the construction phase is finished and the project manager has signed off. Thus to ensure that projects deliver their promised benefits we need to think, not as project managers, but rather as *investors*.

Clarity thus has two aspects to it.

First, we need to be clear that the problem to be solved, the one that we are acting upon, is really worth solving from a corporate perspective. In other words clarity is needed for taking ***the right decisions***.

Second, we need to be clear as to exactly what the problem is that needs to be solved, what options are available to solve it, what criteria we are going to use to judge between these options, what benefits are expected as a result, and how we are going to continuously measure these benefits so that if changes need to be made we can take the necessary steps. In other words clarity is needed to ensure we take ***the right actions***.



2. The Principle of Transparency

Transparency motivates success

Next month (July 2012) the world's best athletes will gather in London for the Olympic Games. Their success depended on a great deal of effort over a prolonged period. It is hard to imagine that they could have maintained this effort and focus for so long if they did not have (a) clear goals to work towards, (b) a means of measuring improvement towards these goals and (c) a way of judging the result, in other words, without a transparent process.

Asset investments, however, often fall far short of these standards; we engage in large and expensive projects with only the vaguest idea of what beneficial outcomes are desired, and no way of measuring whether we are on track or even when and whether the goals are achieved. Our key performance indicators are normally 'was it on time?' and 'was it within budget?' How successful the project was in meeting its service objectives is often unmeasured and, for lack of clarity in determining the service objectives, un-measurable.

Imagine if we were to apply these performance indicators to the Olympic contestants. Suppose we asked 'did they arrive in London on time?' and 'did they manage within budget?' yet failed to record how successful they had been. How meaningful would this be?

Optimising capital investment requires introducing 'Olympic' qualities: clear goals, measurement of improvement to keep the project on track, and clear reporting of results.

Tools for Transparency

1. Infrastructure Australia has provided clear guidelines on what is acceptable to them for support for capital projects and you can download the guidelines and templates from their website.

2. An excellent tool for Transparency is the Investment Logic Maps which we have discussed in SAM issues 246, 247 and 277. This approach has the benefit of being not only a check list but a systematic process that has now been operating for over 5 years. The latest improvements and full instructions, templates, examples, etc. can be found on the Victorian Treasury Website, <http://www.dtf.vic.gov.au/investmentmanagement>



3. The Principle of Evidence Based Decision Making

We can do more

Most of us can put together a convincing business case that apparently weighs up costs against benefits, including considering other options and whole life costs, but how often is the data and knowledge behind these actually challenged?

In contrast with the methodical, data-driven approach now in use for maintenance optimisation, too many organisations still spectacularly depend on hope for their capital decisions – and its triumph over experience. How many organisations rigorously review their previous decisions by, for example, reviewing the actual operational and maintenance costs of their assets five years after those go into operation? Or check their assumptions about demand against actual demand?

However, we can demand more rigorous decision processes based on evidence which we collect routinely – on data and models that are managed and kept live for day to day purposes by those without such a short-term focus, by maintainers or by asset planners, for instance. When we use a whole life cost model to decide between capital options, the models should not be built in a hurry by those who have no experience or expertise in the rest of the lifecycle – or by those likely to have a preconceived idea of the right option. Every time we look at the possible requirement for a new asset, we should insist on real data from the last new assets we acquired.

Whole life costs and benefits in practice

We suppose that the majority of organisations require something like ‘opex of capex’ or ‘operational impact’ as part of the business case for any new asset, and may even demand that Operations sign off this figure. We suppose this is so because it has been true for most of the organisations we have experience of, for twenty years or more. At least one utility company we know of even uses the opex of capex figure in the business case to set the operating budget for the new asset, which at least made Operations pay attention to what they were signing up for.

However, it is also clear that this bears little resemblance to an actual consideration of operating and maintenance costs, and the key issue of whether this varies with different capital options.

Operations often themselves have a bias in favour of new assets, at least until they are delivered to them, and it is notoriously hard to get their full attention during design. This is unsurprising – inevitable, even, like the inevitable project focus of project managers. A good operations manager must be focused on today's problems. To ask them to assess a specification or design and understand its cost implications is, in any case, absurd if they do not have access to the tools to analyse it.

Tools are Available

What is sad about the current situation is that the tools to analyse designs for reliability and maintainability already exist and are well understood by those trained to think about reliability and maintainability. RAMS – reliability, availability, maintainability and safety – analysts are increasingly used in manufacturing. Tellingly, their natural allegiance lies more with maintenance than with design, using very similar data and approaches to maintenance optimisers. We might usefully think of RAMS analysts as a bridgehead from the rest of the lifecycle right into design and build.

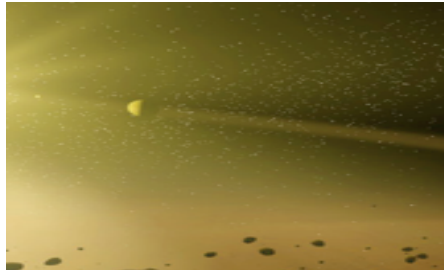
But even this does not go far enough. If we want the assets that will deliver service at the economic optimum cost (simply put as the lowest average annual costs for the whole life from the choice of the capital option through to disposal), we have to understand whole life costs. We have to invest in such cost models and the data they need, and we have to make them live.

Who Owns the Evidence?

Of course, exactly the same data is required for every other asset decision we make, from maintenance to spares holdings to when to replace them, so it's a very good investment. If we do not understand the life costs and the factors that drive them, we don't know whether we're picking a good option or not. It's really as simple as that.

And perhaps the simplest way to achieve this is to give ownership of the cost models to those who are most interested in them day in and day out – those reviewing maintenance schedules or, even better, asset planners with the responsibility to optimise interventions across all categories of work including new assets, maintenance and renewals. They need them; they understand them; they have the most motivation to get them right, without favouring one kind of intervention over another.

Once we have such live models, we can begin to understand the implications of our requirements and designs on other costs and liabilities.



4. The Principle of Integration

Thinking Whole Life

A few, a very few, organisations world-wide now have live whole life cost models for some of their assets. Such models can perhaps best be seen as an encapsulation of our collective understanding of the behaviour of our assets. Even quite crude whole life cost models can make a significant difference in how we approach decision-making, **not necessarily because they include any new data but because they bring together different perspectives in a way we can use.**

One example we know of took just a few days to pull together from known estimates of operational and maintenance costs, and yet immediately the simple spreadsheet model made two issues clear that had eluded discussion before then. The first was about whether it would be cheaper to hire or buy a temporary replacement asset – and that was just bringing out knowledge of the world that we all have (how soon would we want a return on our investment if we were a plant hire company?) The second was facing how vulnerable high-energy-use capital assets are to energy price fluctuations. Both obvious enough, and yet somehow the act of collecting estimates in one place, and playing with our assumptions and scenarios, cut through months of debate.

The Questions We Ask

However, our experience to date shows us integrated whole life planning is not primarily about data models. It is, of course, first and foremost about the questions we ask, how we share knowledge, the whole way we view our assets.

For everyone involved in capital decisions, the lesson from maintenance is instructive. Maintainers have, in many sectors and countries, embraced the idea of Asset Management and the principles of integrated whole life decisions. Maintainers, indeed, have been a major force in promoting good practice Asset Management. For them it makes sense, since they (with the users) suffer the results of poor whole-life decisions. However we might have described the 'culture' of maintenance in the past, today it's common to find the most progressive views promoted there. This cannot be because only the cleverest, most creative people go into maintenance as a career, or that they invest most in formal education or qualifications. But their life experiences tend them towards some of the right questions; and, happily, their belief in Asset Management now rewards some of them in higher professional status and organizational power.

However maintenance, alas, is not all there is to good asset decisions. It is still true that the most important determinant of whether an asset is worth our investment in it is making the right call upfront, in understanding why we need it and what it has to deliver. The question for all of us is therefore how we can bring about an equivalent tipping point of understanding at the front of the asset lifecycle.

Our options might include:

- Using well-trained RAMS specialists in the design stages of new assets, to bring the understanding of performance and costs from the sharp end of operations and maintenance into our early decisions
- Insist that not merely theoretical but practical training in operations and maintenance are obligatory for designers and project managers – or, as one maintenance manager put it, don't let anyone design or construct an asset until they have spent six months in the maintenance front-line
- Recognising the bias in favour of new assets and new technologies in designers, project managers, project champions and even operations (in short, most of us) and building in formal techniques such as Systems Engineering and Investment Logic Maps to counteract this explicitly



1. Start at the beginning.

Examine the problem to be solved.

Not all problems are worth solving and not all problems worth solving require a capital injection. Only by being very clear about the problem, and about the criteria to be used to judge solution options, can we be sure that we are tackling the right problems. Then only by being clear about the options can we be sure that we are tackling the problem in the right way.

Clarity is the first principle of sound capital optimisation.

2. Adopt a systematic and transparent process.

This enables every one involved in the process from the creation of the brief, to the construction of the capital project, to the operators and maintainers, and to those responsible for ensuring that the capital delivers the outcomes promised, to be aware at any given time of the current state of play. If changes need to be made, they can then be made advisedly.

Investment Logic Maps have been very successful transparent process for Victoria, Australia, and they have avoided poor capital choices and saved millions of dollars, but a systems engineering approach that is written down and easily accessible will serve the same purpose.

This is the principle of sound capital optimisation.

3. Be rigorous about the evidence accepted for decision-making.

Require validation of the data and assumptions used in any model used in support of capital decisions. When considering a new asset, insist on real data from the last new asset acquired. To ensure the choice of capital option that delivers the best outcome at the lowest cost over the entire life cycle, requires understanding life cycle costs, not just the first up capital acquisition costs but the ongoing costs of operations, maintenance and renewal. These life cycle cost models need to be maintained by those who have the most incentive to get them right - asset planners who have a responsibility to optimise capital, maintenance and renewal across the portfolio.

This is the Principle of Evidence.

4. Think whole life.

Too many assets have been acquired that look good when new but rapidly deteriorate because insufficient attention was paid to their ongoing care and maintenance, and insufficient thought was given to how the assets would be used and operated. This is not only a matter of using good life cycle cost models, although that is important. It is much more a matter of attitude. By thinking whole life rather than concentrating all efforts solely on capital acquisition, there is a greater chance that the right questions will be asked.

This is the Principle of Integration.

Capital optimisation has a long way to go before it approaches the rigour already possible for maintenance optimisation, but it can be achieved by applying the four principles of clarity, transparency, evidence and integration.