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Strategic Asset Management: A triumph of Mind over Matter

The new Millenium is now so close we could almost have an advent calendar to tick off the days. Thoughts are therefore turning to what skills and knowledge will be necessary for survival in the new world. Much change is anticipated. However, for asset managers, the change is already upon us! We are moving from *acquiring matter*, to *applying 'mind'*.

The last 50 years.

The latter half of the 20th Century has been a time of asset acquisition, (*acquiring matter*) particularly infrastructure assets. Using the age profiles of infrastructure asset portfolios, I have estimated that, for Australia between 1947 and 1967, a period in which the population grew by 50%, the stock of infrastructure and physical assets more than trebled! Similar growth levels were experienced in the UK (expansion of 'new towns', for example) and in the USA and, more recently, in parts of Asia. During this period, the standard of living rose dramatically.

The Last 20 years

From the 1980s the level of asset acquisition slowed down in the developed countries of the USA, UK, Australia and New Zealand. Economic growth also slowed and unemployment started to rise. A flurry of studies in the USA and Australia pressed the case for more infrastructure spending – arguing a correlation between infrastructure growth and economic growth.

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(While it was not difficult to get positive correlations, whether this was because the growth in physical capital *caused* the economic growth or whether it was that the anticipation of economic growth encouraged the growth in physical capital was never satisfactorily resolved.*)

This was also the time when the parlous state of existing infrastructure was revealed in studies such as "Crumbling Academia" (Universities in the USA) and when a series of "Infrastructure Forums" were convened in Australia to generate support for more infrastructure spending.

*The truth is likely to lay with the idea of the anticipation of growth promoting infrastructure development rather than the reverse. John A Tatom, Assistant Vice President of the Federal Reserve Bank of St Louis shows why in "Paved with Good Intentions: the mythical national infrastructure crisis". You will find this on the web at www.cato.org/pubs/

The money stopped

More money would have allowed managers to continue in the old mode of overseeing construction and re-construction and the skills learnt in the growth period, particularly project management skills, would have continued to be relevant. But the money wasn't forthcoming.

…and Asset Managers became smarter!

Gradually asset managers have realised that the way of the future is not going to be 'more of the same', i.e. more spending, more infrastructure. Our assets have been getting smarter and now, so must we.

Asset Managers have a key role in the knowledge economy.

Moving into the knowledge economy.

The opening story of Thomas Stewart's "Intellectual Capital" ***** runs (in abbreviated form) like this.

The lesson of the beer can

Consider a beer can. Three decades ago it would have been built of steel. Aluminium companies wanted to produce cans but until electricity became plentiful and cheap, aluminium was more expensive than gold! Even with cheap power, aluminium still costs more than steel, but it is so much easier to work, more malleable. It was not until 1963 that Reynolds Metals invented a method for mass producing aluminium cans. The first can weighed just .66 of an ounce, about half what a steel can weighed. Today's can weighs only .48 of an ounce. Drink the beer! You can crush the can with one hand. Yet when it's full that same can is strong enough to be stacked in towers six feet high, piled in the back of a delivery truck, slammed around, chilled to 35 degrees, baked in 95 degree sun. What holds it up? Not the metal – crushing shows that. No, what keeps the can rigid, strong enough to withstand pressure of up to ninety pounds per square inch, is the gas inside. Less metal – less energy – but years of research, information and intelligence. The beer can is an icon of the Knowledge Age, the *economy of the intangible*.[1]

***** Thomas Stewart "Intellectual Capital", Nicholas Brealey Publishing Limited, London, 1998

The **Role of the Asset Manager** in the future

Economy of the Intangible

The economy of the intangible! Evocative words. What is the role for physical TANGIBLE capital assets in the economy of the intangible? *What is the role for the manager of those assets?*

On page 90 of Stewart's "Intellectual Capital" people are sorted into four quadrants.

Where are you?

Difficult to replace; Low value added	Difficult to Replace; High value added
Easy to replace; Low valued added	Easy to Replace; High value added

And where do you want to be?

unskilled?

'Unskilled and semiskilled labour go in the lower left quadrant. The organisation may need such people, maybe lots of them, but its success doesn't depend on them *as individuals*. They are fungible' (disposable). (maintenance workers, construction workers?)

skills, but not demand critical?

'Above them, in the upper left, go people who have learned a complicated set of ropes but don't pull the strings, such as skilled factory workers, experienced secretaries'. 'They may be hard to replace and doing important work. If they stuff up business can be lost. But a business does not win work because of them.' (maintenance supervisors?).

skills, but no power?

'Lower right workers do stuff that customers value highly but as individuals they are fungible' (architects, engineers?)

skills in high demand?

'Finally, in the upper-right quadrant go the stars; people who play irreplaceable roles in the organisation and who are damn near irreplaceable as individuals. A company's human capital is in the upper right quadrant… The greater the human capital intensity of a business – that is, the greater its percentage of high –value-added work performed by hard-to-replace people – the more it can charge for its services and the less vulnerable it is to competitors.'

How do you get into the upper right quadrant?

Think about it! Strategic asset management is *all knowledge.* How many individuals in your organisation really know the organisation's strategic vision and can leverage its physical capital to get it there?

'Individuals in the upper right quadrant may be perched high in the company tree, *most aren't.* They might be research chemists, top sales reps, project managers, movie stars. One group at Hewlett- Packard estimates that incoming engineers need more than two full years before they become full-fledged contributors to their team; hard to replace, indeed, and an expensive investment.'

"Strategic Asset Management" is about helping you to develop your skills, your knowledge, enabling you to 'become a star'*! Mind is taking over from matter!. You can be part of the 'old regime' or part of the new one.*

(AMQ International is working on an internationally recognised self-development program for asset management professionals - more of this later!)

In the Next issue: Facing the Asset Renewal Challenge

AIS – What to do before you choose

Unless it is *usable* and *used*, the data in your Asset Information System are just so many black marks on white paper – or their electronic equivalent. It may have been expensively gained but it is *not information*. In this five part series we look at mistakes that have been made – and how you can avoid them in setting up your own database.

Part 2: NEVER CHOOSE A SYSTEM CLEVERER THAN YOU!

Cleverness can 'cost'

Like your PC, the typical AIS today can do more things than you will ever want or need. Unlike your PC, however, the AIS will need to be populated with data before it will give you anything at all. The more complicated and complex your system and the more detail it can provide, the more detail you will need to put in. Computing time is cheap. Data collecting and input time is not. This is the first reason to carefully consider what you want out of your system and not to be 'bowled over' by the impressive capabilities of new software.

AIS an aid, but not the answer.

Asset information systems are now so well developed that, whether off-the-shelf or custom-designed, it may seem as if all that needs to be done is to choose the 'right' system and all of your asset management problems are basically solved. This thinking is dangerous. True, AIS can produce work orders based on problem diagnosis, but it is the rare system indeed (and the rare programmer) who can anticipate every situation, technical and financial.

One company was using a decentralised model that allowed work orders to be generated and was delighted by the simplicity and the freedom from decision making that it provided - until it realised that it had gone through its entire year's maintenance budget in just on 5 months!

Most systems can generate a set of priority one and two tasks that exceed the total maintenance budget available. Suppose you do all of the priority ones, you still have to make a decision on the priority twos. You may even find that the budget is not sufficient to cater for all of the priority ones. Again you have to intervene. When you DO intervene, it is either to hand sort the range of options provided by the system, or to fine tune the system itself.

Understanding Your System.

To fine-tune a system means that you have to *understand why it is giving you the answers that it is.* These answers are a function of the assumptions and decision processes built into the model. It is entirely posible for the model, possibly built up in stages over time, to get so complex that not even the modeller *really* understands it anymore. 'Understanding' is more than knowing where to input data - *it means knowing why the answers are coming out the way they are!*

The case of the 'out of control' forecasting model

Serious problems arise when models become too clever for their users. The generation model used by one electricity company was telling it that a new power station needed to be built. What is more, the model required that this station would be replaced by yet

another new power station when only 2/3 of the normal life span of the station had expired. When asked, the modeller was unable to explain why and was reduced to saying simply that 'the model had required it'.

In this case the model had already become too complex for him to understand why it was requiring such a wasteful and costly exercise. What was worse, no-one else in the company understood it either.

Regulatory pressure eventually caused the company to by-pass its model and to calculate future requirements 'by hand'. The result was that the new station was not built, saving the company over $500m.

Another case of the model no-one understood

In another case, a hydro electric company's model had projected that its heavy debt situation would be completely corrected within 4 years by following the current pricing regime and, indeed, from year 5 it would be making increasing surpluses! Again, no one in the company knew precisely what assumptions and decision processes fed into the model were generating such an optimistic forecast. Debt did not fall. It continued to rise.

Today, ten years later, that company is in such difficulties that the only solution is to sell out to another company that will undertake the major restructuring required.

The Risky "Risk Model"

On a smaller scale there was the company that was considering a system that would generate work orders based on a risk management regime built into the model. The model worked out the risk cost (by multiplying the cost of risk by the likelihood of it eventuating) and the highest risk costs got the priority for work orders.

But this did not take into account the fact that some risks you can do something about quite cost effectively, others you cannot. The model should have ranked them according to the benefit cost of actions taken, but it didn't. However, because the answers came out of the computer, they were believed. No-one using the model knew what had gone into the system to produce the result.

All systems need updating

If you do not know what is producing the answers that the system gives you, you are doomed to accepting them, whether they are right or wrong. And while they will not generally be designed incorrectly in the first place, as the risk model was, nevertheless things change over time. What was a good decision rule five years ago, when an agency was growing rapidly, may not be a good rule today when the portfolio has stabilised. And it may be even less appropriate if the portfolio now needs to be rationalised.

Consider the advantages of a model where the 'workings' are obvious to the user and not hidden away inside a 'black box'. The black box models give the appearance of being simple, but are difficult to understand and change as your situation changes.

If there is one thing you can be sure of, your situation WILL change. That is why it pays never to get a system that you cannot change along with you; why it pays never to get a system 'cleverer than you are'.

Next Issue: AIS, Pt 3: *What has your Asset Register done for you lately?*

Weblink:
"Forecasting Asset Renewal"

Introducing

the 'interactive' SAM service - WEBLINK. A series of discussion topics on the amqi.com website will be introduced two weeks before they start to give you time to prepare. A panel of experts will then be available to 'moderate' the discussion - ie to answer questions, make comments, and generally keep the discussion 'on track' so that you don't waste your time. The introductions will be self contained, so that you will still benefit even if you do not wish to **take advantage of free specialists on the website.** Key issues raised will be summarised after the panel finishes.

Discussions will start *February 12th* and run to March 11th - www.amqi.com

Forewarned is Forearmed

With renewal, forewarned is forearmed. It can overwhelm you completely if you let it creep up on you unawares. Condition audits can only tell you what is needed within the next 2-3 years - and when you only have that little lead time there is not much planning that you can do, or that many options available to you. To really get on top of asset renewal you need to know what is coming up long enough in advance to look at alternative service delivery, technical and financial, options. This means *modelling your asset renewal.*

"Facing the Renewal Challenge"

During 1997-1998, the Victorian Department of Infrastructure, through the Office of Local Government, surveyed all 78 of its local councils to determine likely future infrastructure asset renewal - and what could be done to mitigate some of its more serious impacts.

(See the next issue of SAM for the major findings from this report)

Discussion Panel

Those most closely associated with this study - the Client, John Cincotta, Department of Infrastructure, Victoria; - Steering Committee member, Bill Jabor, CEO of Greater Shepparton Council - and the consulting team, Dr Penny Burns of AMQ International, David Hope of Skilmar Systems and Jeff Roorda of Jeff Roorda and Associates, will moderate the first of our weblinks - the discussion panel on 'forecasting future renewal' which will run on the amqi website (see details above) from February 12th to March 11th.

Issues to be discussed include:

Selecting and recording assets

Which assets? Not all assets are 'renewable'; some have already been earmarked for disposal, others (like land) are intrinsically not renewable. Some assets are maintained by regular annual renewal (eg railtrack) so that the problem of future 'peakiness' does not arise. Grouping assets, to reduce the modelling problems and increase the ease with which the results can be interpreted and used, is a major planning issue. With infrastructure, renewal refers to the replacement of components, rather than the asset system as a whole. Which assets will you include?

Assigning values

Replacement values, not historic values

naturally; but also consider the costs of removing the existing asset or component. Cost of renewal is not the same as cost of installing a new asset on a green field site. Renewal involves working around existing infrastructure and existing and ongoing service delivery. How will you determine the appropriate values for your asset renewal modelling (a hint: they will be unlikely to be the figure in the accounts!)

Useful ('economic') lives

The life of an asset is the time between its acquisition and the time when for reasons of collapse or cost effectiveness (whichever comes first) it needs to be replaced. Judging the useful life of an asset is easier, the closer it comes to the end! Past experience needs to be modified for new materials and construction methods. With roads, in particular, usage is important as is climatic variation. Many factors affect the life of an asset. Asset 'lives' given in the literature need to be modified according to individual circumstances. How do you determine appropriate lives for your assets?

Determining age

What is the age of a building that has had the cabling renewed 5 years ago, the roof replaced ten years ago, airconditioning installed 2 years ago and the foyer remodelled last year? The age of assets that have had some renewal or modification already is very difficult to determine. What's the answer?

Modelling renewal

How do you put all this information together to produce answers not only this year, but in years to come when you are busy modifying, renewing and extending the initial database?

A practical "how to do it" session

Discuss your solutions to these problems, have your questions answered, and find out who is doing what!

Tune in to www.amqi.com
Feb 12th - March 11th

Funding renewal

Renewal will not affect all of your asset groups or departments evenly. Some will need more, some less. Switching between budget groups needs to be managed with care. Increasing the total level of renewal - where does the money come from?

Default assumptions

You will need to make assumptions and they need to be written down. What assumptions do you need to make? Assumptions about age (where data is scant), about economic lives, about technological and demand change, about demographics, many things.

Default assumptions are not supposed to be 'realistic' but rather 'easily measured' and 'minimum change'. Thus one of the default assumptions in the Victorian Infrastructure study was that assets would be replaced with substantially the same time of asset as already in existence.

It was suggested that a 'better' assumption may be that 'the demand upon assets will force assets to be continually upgraded to meet expected, and increasing, service levels.' This may be more 'realistic' but it is not necessarily 'better', as it requires more 'guesswork' and destroys the rigour of the modelling process.

Discuss these and related issues, such as how to manage renewal when it falls short

GLOSSARY

Renewal

Standards Australia has produced the "Glossary of Building Terms" SAA HB50 –1994. It is shortly to be revised. The word "renewal" does not occur in the 1994 issue. It is of more recent usage and is an umbrella term that covers everything that needs to be done, in a lumpy manner, to continue the functionality of the asset. In this sense it includes replacement, repair, major repair, and major maintenance. (It does not include regular or routine maintenance).

Discussion

For Infrastructure assets, the word 'renewal' is preferable to 'replacement'. Infrastructure systems are seldom replaced in their entirety, instead, by piecemeal replacement of individual components, the entire system is *renewed.* It applies to networks and major facilities. These are 'Complex Assets – those assets that have component parts with differing life expectations, and where the total asset is kept as a functioning unit by the continuous replacement of its parts, such as a building' (Glossary of Building Terms). Renewal includes major maintenance as well as component replacement. Renewal continues the functionality of the asset system, it does not enlarge or upgrade the system.

Forecasting infrastructure renewal is a matter of identifying the key component parts that need renewing and their age. As the component parts may have previously been replaced they are not necessarily the same age as the asset itself. Thus a roof of a building may be only ten years old when the foundations are 70 years old. Using the principles of life cycle planning, renewal of infrastructure and complex assets can be modelled based on the expected life of components and estimates of their age.

This life cycle forecasting method was developed by the South Australian Public Accounts Committee in a series of Parliamentary papers covering all major South Australian infrastructure. Subsequently it was also used by the National Public Works Committee (now the Australian Procurement and Construction Council) in their studies of renewal of schools and hospitals. Other, unpublished, studies have also used the same approach. The most recent, and extensive, use of the method was in the study "Facing the Renewal Challenge" conducted by the Victorian Department of Infrastructure, the subject of the first of the moderated weblink discussion panels (see p.14)

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